Member IMC Group Tungaloy

ACCELERATED MACHINING




# General Catalog

**2017 / 2018**


tungaloy



Member IMC Group Tungaloy

In an accelerated world, a quick response to market needs is necessary. As a pioneer in innovation, **Tungaloy** leads the market in developing unique and powerful grades and geometries for this new era. TUNGFORCE, our newest line of products is designed for accelerated machining, bringing you the newest and greatest solutions for your machining needs.

Member IMC Group Tungaloy

2017 / 2018

# full product line



www.tungaloy.com

## Grade A

| | |
|---|---|
| Coated Grade CVD | A002 |
| Coated Grade PVD | A003 |
| Ceramic | A005 |
| Cermet | A005 |
| CBN (T-CBN) | A006 |
| PCD (T-DIA) | A007 |
| Uncoated Cemented Carbide | A007 |

## TurnLine B

| | |
|---|---|
| Insert | B002 |
| External Toolholder | B180 |
| Internal Toolholder | B262 |
| Miniature Machining | B318 |
| Threading | B376 |

## GrooveLine C

| | |
|---|---|
| Parting, Grooving, and Groove-Turn system | C002 |

## MillLine D

| | |
|---|---|
| High-Feed Milling | D002 |
| Shoulder Milling | D032 |
| Face Milling | D118 |
| Slot Milling | D172 |
| Profile Milling | D188 |
| Multi-Functional Milling | D224 |
| Milling Insert | D315 |

## DrillLine E

| | |
|---|---|
| Full Effective Drill | E004 |
| Indexable Drill | E070 |
| Deep Hole Drill | E102 |

## ToolLine F

| | |
|---|---|
| Tooling System | F002 |

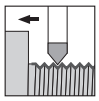
## User´s Guide G

| | |
|---|---|
| Parts for Tool | G002 |
| Technical Reference | G029 |
| Alphanumeric Index | G084 |

# Introduction

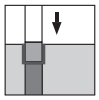
## Icons in the chart section for each product

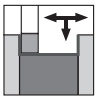
### Threading

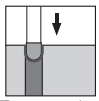

Ext. threading


Int. threading

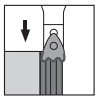
### Grooving

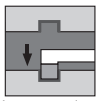

Ext. grooving


Ext. grooving and turning


Ext. grooving (full R)

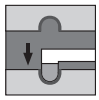

Ext. grooving and turning (full R)

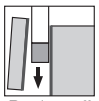

Forming

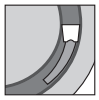

Int. grooving


Int. grooving and turning

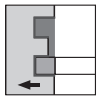

Int. grooving and turning (full R)

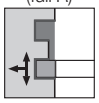

Int. grooving (full R)


Parting-off


Face grooving


Face grooving and turning


Int. face grooving


Int. face grooving and turning


Face grooving for shaft

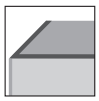
### Milling


Shoulder milling


Deep shoulder milling



Shoulder milling (with radius)


Face milling

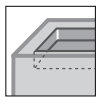

Slotting

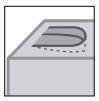


Slotting (with radius)


Side slotting


Side milling

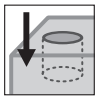

Pocketing


Ramping


Profiling


Plunging

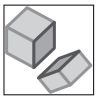

Hole enlarging


Holemaking

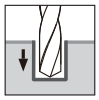

Counterboring

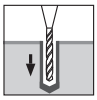

Hole chamfering


Chamfering


Cutting-off

### Drilling


Drilling


Small-diameter drilling


Deep-hole drilling


Hole chamfering



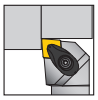
Tool kit

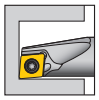

Oil hole

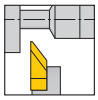

Oil hole for high-pressure

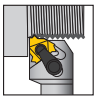
## Icons in column on the right/left side of the page

### Turning

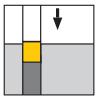

Ext. toolholder


Int. toolholder


Miniature tool


Threading tool

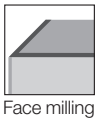
### Grooving, turning, and parting-off


Grooving, turning, and parting-off tool

### Milling


High-feed milling


Shoulder milling


Face milling


Slot milling


Profile milling


Multi-functional milling

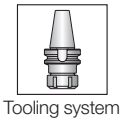
### Drilling


2-effective drill


Indexable drill


Deep hole drill

### Tooling system


Tooling system

# Introduction

## Note in using this catalog:

★ This catalog provides the information of Tungaloy's cutting tools as of November 2016.

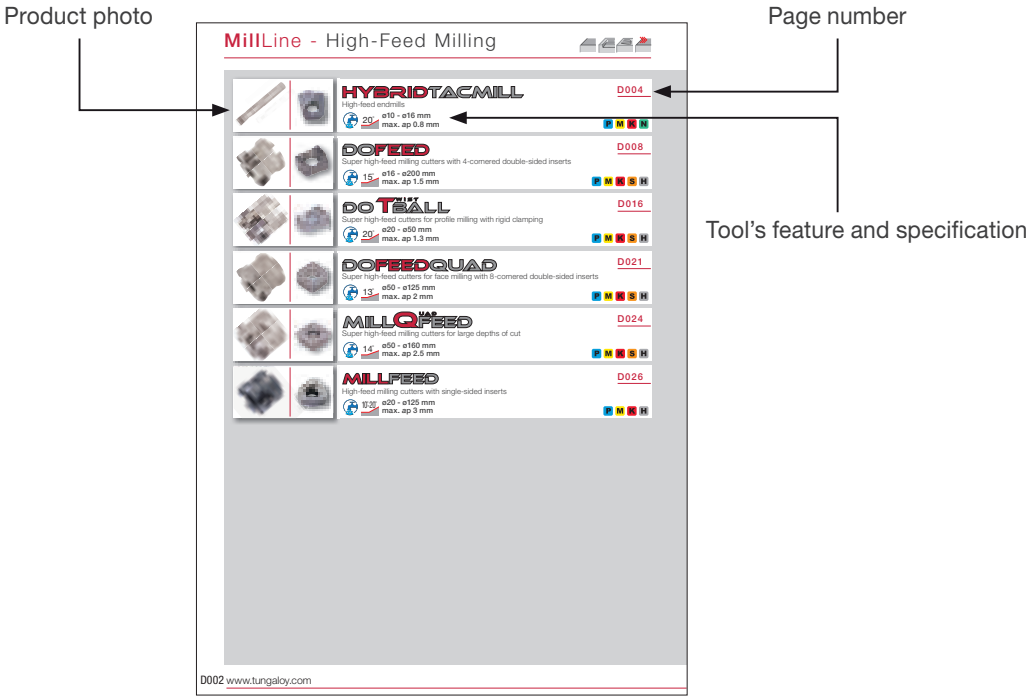
★ Our products are being modified for further improvement, and the specifications are subject to change without prior notice. Also, the products may be discontinued in the future due to the development of new products.

★ The dimensions of all products are shown in millimeters (mm).

★ For indexable tools, such as toolholders, cutters, drill bodies, applicable inserts or heads need to be ordered separately.

## How to find a tool:

★ The catalog classifies the cutting tools into 5 lines – TurnLine (turning tools), GrooveLine (grooving tools), MillLine (milling tools), DrillLine (drilling tools), and ToolLine (tooling systems). The tools in each line are categorized by the applications.




Example: Contents of the cutters for high-feed milling in MillLine

★ Alphanumeric index in User's Guide helps you search a specific product.

## How to read the list for the standard items:

★ Designations for indexable tools – toolholders, cutters, drill bodies, etc.

· Orders are to be received for the tools with the designations in the catalog.

· For the tool with right- and left-hand options, the designation includes **R/L** as shown below.

Ex. 1: Designation: A16Q-STFP**R/L**13-D180

You can order both right- and left-hand tools. A16Q-STFP**R**13-D180 (a right-hand tool) and A16Q-STFP**L**13-D180 (a left-hand tool) will be available.

Ex. 2: Designation: A20R-STFP**R**13-D220

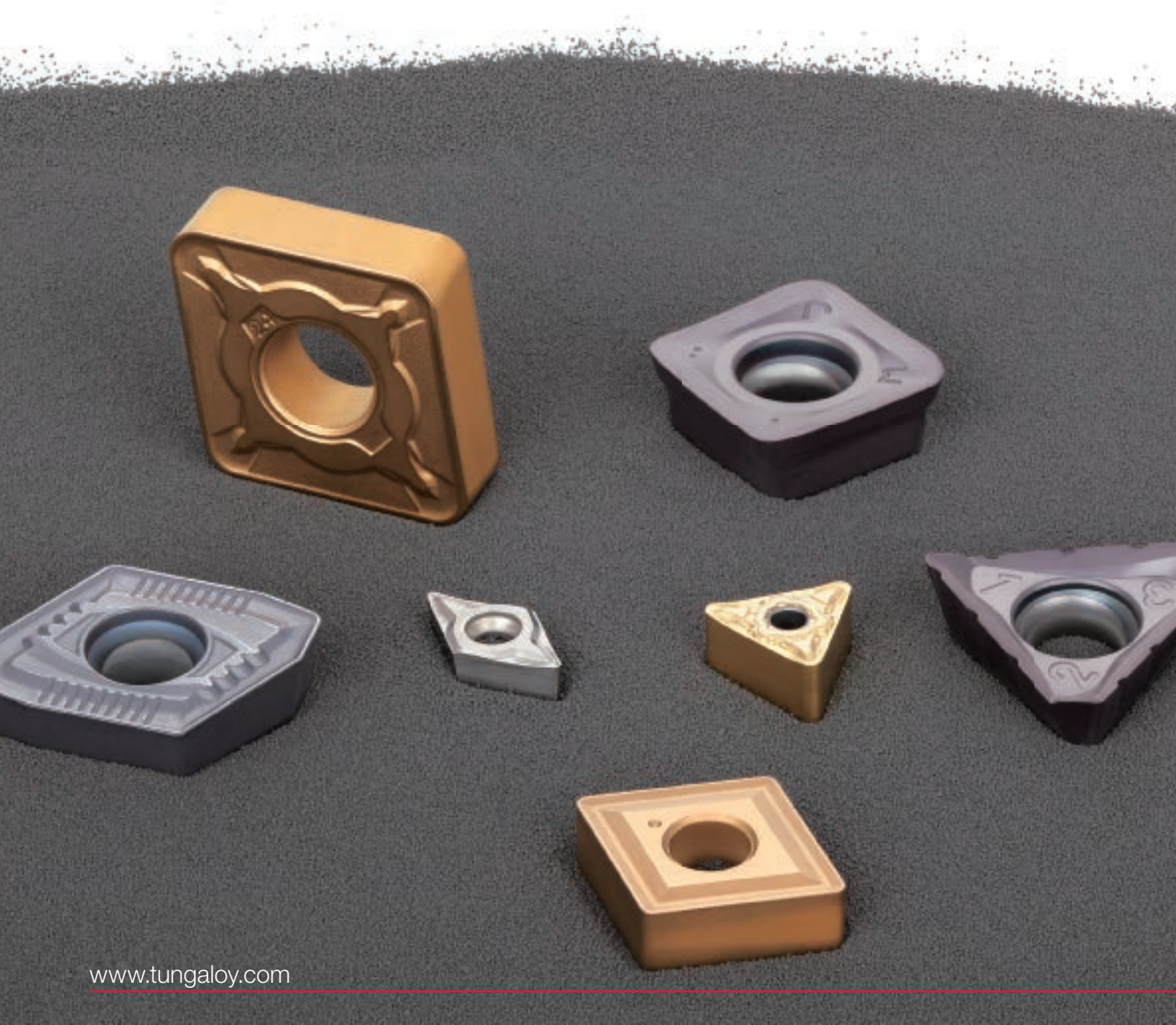
You can order only right-hand tools. Please contact us when you need left-hand tools.

★ Line-up for inserts and solid tools

● : Orders will be always received for the product.

Blank : Please contact us regarding the product.

# Grade



# GRADE


Coated Grade CVD A002

Coated Grade PVD A003

Ceramic A005

Cermet A005

CBN (T-CBN) A006

PCD (T-DIA) A007

Uncoated Cemented Carbide A007

# CVD - Coated Grade

| Grade | Coating | | Application | Feature | Turning | Grooving | Milling | Drilling |
|---|---|---|---|---|---|---|---|---|
| | Main composition | Thickness / µm | | | | | | |
| **T9105**<br>P01 - P10<br>K10 - K20 | TiCN-$Al_2O_3$ | 16 | P K | - Good wear resistance<br>- Excellent performance in high-speed cutting | ■ | | | |
| **T9115**<br>P10 - P20<br>K15 - K30 | TiCN-$Al_2O_3$ | 16 | P K | - Well-balanced between wear and chipping resistance<br>- Suitable for a wide range of turning applications | ■ | | | |
| **T9125**<br>P20 - P30 | TiCN-$Al_2O_3$ | 16 | P | - High chipping resistance in light to medium interrupted cutting<br>- First choice for machining steel | ■ | ■ | | |
| **T9135**<br>P30 - P40 | TiCN-$Al_2O_3$ | 16 | P | - Excellent fracture resistance in heavy interrupted cutting | ■ | | | |
| **T6120**<br>P10 - P20<br>M10 - M20 | TiCN | 6 | P M | - Good wear resistance in continuous cutting at high speed | ■ | | | |
| **T6130**<br>P15 - P30<br>M15 - M30 | TiCN | 6 | P M | - High wear resistance in cutting at medium to high speed<br>- First choice for machining stainless steel | ■ | | | |
| **T515**<br>K10 - K20 | TiCN-$Al_2O_3$ | 16 | K | - Good wear resistance even in high-speed machining<br>- First choice for roughing cast iron | ■ | | | |
| **T5105**<br>K05 - K15 | TiCN-$Al_2O_3$ | 16 | K | - High resistance to wear and plastic deformation in continuous cutting at high speed | ■ | | | |
| **T5115**<br>K10 - K20 | TiCN-$Al_2O_3$ | 16 | K | - Stable machining in a wide range of applications from continuous to interrupted cutting | ■ | | | |
| **T5125**<br>K15 - K30 | TiCN-$Al_2O_3$ | 16 | K | - Strong resistance to sudden fracture<br>- Ideal for heavy interrupted machining | ■ | | | |
| **T313V**<br>- | TiCN-$Al_2O_3$ | 3 | Threading | - Good resistance to plastic deformation<br>- Designed for threading | ■ | | | |
| **T3225**<br>P20 - P35<br>M20 - M35 | TiCN-$Al_2O_3$ | 10 | P M | - High chipping and fracture resistance<br>- Suitable for machining steel and stainless steel | | | ■ | |
| **T3130**<br>P20 - P40<br>M20 - M40 | TiCN-$Al_2O_3$ | 6 | P M | - Good balance between wear and chipping resistance<br>- Ideal for machining steel and stainless steel | | | ■ | |
| **T1215**<br>K10 - K25 | TiCN-$Al_2O_3$ | 10 | K | - Good balance between wear and chipping resistance<br>- Designed for machining cast iron | | | ■ | |
| **T1115**<br>K10 - K25 | TiCN-$Al_2O_3$ | 11 | K | - High wear resistance<br>- Ideal for machining cast iron | | | ■ | |

# PVD - Coated Grade

| Grade | Coating: Main composition | Coating: Thickness / μm | Application | Feature | Turning | Grooving | Milling | Drilling |
|---|---|---|---|---|---|---|---|---|
| **AH110**<br>P05 - P15<br>M05 - M15<br>K10 - K25<br>S05 - S15 | (Ti, Al)N | 3 | P M K S | - High wear resistance<br>- Suitable for finishing steel, cast iron, and high-hardened material | ■ | | ■ | |
| **AH120**<br>P15 - P25<br>M15 - M25<br>K15 - K30<br>S10 - S25 | (Ti, Al)N | 3 | P M K S | - Good balance between wear and fracture resistance<br>- Suitable for machining steel, stainless steel, and cast iron under general cutting conditions | ■ | ■ | ■ | ■ |
| **AH130**<br>P25 - P40<br>M25 - M40 | (Ti, Al)N | 3 | P M | - High chipping and fracture resistance<br>- Designed for machining austenitic stainless steel under general cutting conditions | | | ■ | |
| **AH140**<br>M30 - M45 | (Ti, Al)N | 3 | M | - High fracture resistance<br>- Suitable for machining stainless steel | | | ■ | |
| **AH170**<br>P20 - P35<br>M20 - M35<br>K15 - K30 | (Ti, Al)N | 3 | P M K | - High wear resistance<br>- Suitable for steel and cast iron drilling | | | | ■ |
| **AH180**<br>P20 - P35<br>M20 - M35<br>K15 - K30 | (Ti, Al)N | 3 | P M K | - High wear resistance<br>- Suitable for steel and cast iron, stainless drilling | | | | ■ |
| **AH330**<br>P15 - P30 | (Ti, Al)N | 3 | P | - Excellent wear resistance | ■ | | ■ | |
| **AH630**<br>P15 - P30<br>M15 - M30 | (Ti, Al)N | 5 | P M | - Good resistance to wear and fracture in machining stainless steel at low to medium cutting speed | ■ | | | |
| **AH645**<br>P30 - P40<br>M30 - M40 | (Ti, Al)N | 5 | P M | - High fracture resistance in machining stainless steel | ■ | | | |
| **AH710**<br>P05 - P15<br>K05 - K15<br>H05 - H15 | (Ti, Al)N | 3 | P K H | - High wear resistance<br>- Ideal for finishing cast iron and high-hardened material | ■ | ■ | ■ | |
| **AH725**<br>P15 - P30<br>M15 - M30<br>K25 - K30<br>S15 - S25 | (Ti, Al)N | 2 | P M K S | - Good balance between wear and chipping resistance<br>- Suitable for machining steel and stainless steel under general cutting conditions | ■ | ■ | ■ | ■ |
| **AH7025**<br>P20 - P30<br>M20 - M30<br>S15 - S25 | (Ti, Al)N | 3.5 | P M K | - Excellent wear resistance and high rigidity<br>- First choice for grooving of various materials | | ■ | | |
| **AH730**<br>P15 - P30 | (Ti, Al)N | 3 | P | - Well-balanced between wear and fracture resistance | ■ | | ■ | |
| **AH740**<br>P25 - P40 | (Ti, Al)N | 3 | P | - Excellent chipping resistance in machining steel | | | | ■ |
| **AH750**<br>H15 - H30 | (Ti, Al)N | 3 | H | - High wear resistance<br>- Suitable for hard material machining | | | ■ | |
| **AH8005**<br>M01 - M10<br>S01 - S10 | (Al,Ti)N | 3.5 | M S | - Good balance between wear and fracture resistance<br>- First choice for machining heat-resistant alloys under general cutting conditions | ■ | | | |
| **AH8015**<br>M10 - M20<br>S10 - S20 | (Al,Ti)N | 3.5 | M S | - Strong resistance to wear and built-up edge | ■ | | | |
| **AH905**<br>S01 - S10 | (Al, Ti)N | 1.5 | S | - Strong resistance to wear and built-up edge | ■ | ■ | | |

# PVD - Coated Grade

| Grade | Coating: Main composition | Coating: Thickness / µm | Application | Feature | Turning | Grooving | Milling | Drilling |
|---|---|---|---|---|---|---|---|---|
| **AH3035**<br>P20 - P45<br>H20 - H30 | (Ti, Al)N | 5 | P H | - Good balance between wear and chipping resistance<br>- Suitable for machining high-hardened material at high feed | | | ■ | |
| **AH3135**<br>P30 - P40<br>M30 - M40 | (Ti, Al)N | 4 | P M | - High fracture resistance<br>- Ideal for machining steel and stainless steel under general cutting conditions | | | ■ | |
| **AH4035**<br>M30 - M45 | (Ti, Al)N | 5 | M | - Good balance for wear and fracture resistance<br>- Suitable for difficult stainless steel machining | | | ■ | |
| **AH6030**<br>M25 - M35<br>S15 - S30 | (Ti, Al)N | 5 | M S | - High fracture resistance<br>- Ideal for drilling stainless steel and heat-resistant alloys under general cutting conditions | | | | ■ |
| **AH9030**<br>P15 - 35<br>K10 - 25 | (Ti, Al)N | 5 | P K | - High wear resistance<br>- Designed for drilling steel and cast iron at high speed | | | | ■ |
| **SH725**<br>P20 - P30<br>M20 - M30 | (Ti, Al)N | 2 | P M | - Excellent wear resistance<br>- Suitable for machining steel and stainless steel | ■ | ■ | | |
| **SH730**<br>P20 - P35<br>M20 - M35<br>S05 - S15 | (Ti, Al)N | 1 | P M S | - High wear resistance<br>- Suitable for machining steel, stainless steel, and difficult-to-cut materials | ■ | ■ | | |
| **GH110**<br>K10 - K25<br>N05 - N15 | Ti(C, N, O) | 3 | K N | - Good wear resistance | ■ | | ■ | |
| **GH130**<br>P25 - P40<br>M25 - M40<br>K25 - K40 | Ti(C, N, O) | 3 | P M K | - High chipping and fracture resistance<br>- Suitable for machining steel, stainless steel and cast iron | | ■ | ■ | ■ |
| **GH330**<br>P15 - P30<br>M15 - M30<br>K05 - K30 | Ti(C, N, O) | 3 | P M K | - Strong resistance to wear and fracture<br>- Suitable for continuous to medium interrupted cutting | ■ | ■ | ■ | |
| **GH730**<br>P20 - P35<br>M20 - M35<br>K20 - K30 | Ti(C, N, O) | 3 | P M K | - High wear resistance<br>- Ideal for turning and grooving at low speed | ■ | ■ | | |
| **J740**<br>- | TiN | 1 | For small lathes | - Ultra-fine-grain cemented carbide coated with TiN-based compound | ■ | ■ | | |
| **YH170**<br>P20 - P35<br>M20 - M35 | Ti(C, N) | 1.5 | P M | - Strong resistance to wear and fracture<br>- Suitable for steel and stainless drilling | | | | ■ |
| **YH180**<br>P20 - P35<br>M20 - M35 | Ti(C, N) | 1.5 | P M | - High wear resistance<br>- Suitable for steel and stainless drilling | | | | ■ |
| **JM10**<br>P20 - P35<br>M20 - M35 | TiN | 1 | P M | - High wear resistance<br>- Suitable for steel and stainless drilling | | | | ■ |
| **DS1100**<br>N05 - N20 | DLC coating | Thin layer | N | - High wear resistance<br>- Designed for finishing aluminium | | | ■ | |
| **DS1200**<br>N10 - N25 | DLC coating | Thin layer | N | - Good balance between wear and chipping resistance<br>- Ideal for semi-finishing to finishing of aluminium | | | ■ | |

# Ceramic

| Grade | Specific gravity | Hard-ness (HRA) | T.R.S. (GPa) | Application | Feature | Turning | Grooving | Milling | Drilling |
|---|---|---|---|---|---|---|---|---|---|
| LX11 | 4.35 | 94.0 | 0.9 | H | - Alumina base<br>- Suitable for continuous cutting of high-hardened materials | ■ | | | |
| LX21 | 4.24 | 94.0 | 0.8 | K | - Alumina base<br>- Excellent chipping resistance in continuous cutting of cast iron | ■ | | | |
| FX105 | 3.24 | 93.0 | 1.3 | K | - Silicon nitride base<br>- Suitable for high-speed machining of cast iron | ■ | | ■ | |
| CX710 | 3.20 | 92.9 | 1.1 | K | - Silicon nitride base<br>- Excellent performance in high-speed machining of cast iron | ■ | | | |

# Cermet

| Grade | Coating | | Application | Feature | Turning | Grooving | Milling | Drilling |
|---|---|---|---|---|---|---|---|---|
| | Main composition | Thickness / µm | | | | | | |
| GT9530 | Ti(C, N, O) | 3 | P K | - High wear resistance<br>- Ideal for finishing with high surface quality | ■ | | | |
| J9530 | TiN | 1 | For small lathes | - Suitable for small-part machining | ■ | ■ | | |
| NS9530 | Uncoated | - | P K | - High fracture resistance<br>- Suitable for finishing to medium cutting of steel | ■ | ■ | | |
| NS740 | Uncoated | - | P | - Good resistance to fracture and thermal crack<br>- Ideal for milling operations that require high rigidity | | | ■ | |
| NS520 | Uncoated | - | P K | - Good wear resistance | ■ | | | |
| GT720 | Ti(C, N, O) | 3 | P K | - Good wear resistance in high speed machining | ■ | | | |
| X407 | Uncoated | - | P | - Good wear resistance for finish on dry machining | ■ | | ■ | |
| N308 | Uncoated | - | P | - Good wear resistance | | | ■ | |

# CBN (T-CBN)

| Grade | Hardness (Hv) | T.R.S. (GPa) | Application | Feature | Turning | Grooving | Milling | Drilling |
|---|---|---|---|---|---|---|---|---|
| BXA20 | 3300 ~ 3500 | 1.30 ~ 1.50 | H | - Excellent performance in machining hardened steel | ■ | | | |
| BXM10 | 2700 ~ 2900 | 0.80 ~ 0.90 | H | - Suitable for machining hardened steel with continuous cutting at high speed | ■ | | | |
| BXM20 | 3500 ~ 3700 | 1.35 ~ 1.50 | H | - First choice for machining hardened steel in a wide range of applications | ■ | | | |
| BXC50 | 3500 ~ 3700 | 1.15 ~ 1.30 | H | - High fracture resistance in continuous to interrupted machining | ■ | | | |
| BX310 | 2700 ~ 2900 | 0.80 ~ 0.90 | H | - Good wear resistance<br>- Designed for continuous cutting of hardened steel at high speed | ■ | | | |
| BX330 | 2800 ~ 3000 | 0.85 ~ 0.95 | H | - Excellent sharpness<br>- Designed for finishing hardened steel | ■ | | | |
| BX360 | 3200 ~ 3400 | 1.00 ~ 1.10 | H | - Suitable for general-purpose machining of hardened steel | ■ | ■ | | |
| BX380 | 3500 ~ 3700 | 1.15 ~ 1.30 | H | - High fracture resistance<br>- Suitable for heavy interrupted cutting of hardened steel | ■ | | | |
| BX530 | 2800 ~ 3000 | 0.85 ~ 0.95 | H | - Suitable for finishing hardened steel with high surface quality | ■ | | | |
| BXC90 (BX90S) | 3900 ~ 4100 | 1.80 ~ 1.90 | K | - Suitable for machining cast iron at high speed | ■ | | ■ | |
| BX910 | 2600 ~ 2800 | 0.80 ~ 0.90 | K | - Excellent wear resistance in high-speed machining<br>- Ideal for machining centrifugally cast iron | ■ | | ■ | |
| BX930 | 3000 ~ 3200 | 0.95 ~ 1.20 | K | -Designed for machining ductile cast iron | ■ | | | |
| BX950 | 3900 ~ 4100 | 1.80 ~ 1.90 | K S | - High fracture resistance<br>- Good performance in high-speed machining | ■ | | ■ | |
| BX850 | 3300 ~ 3500 | 0.75 ~ 0.85 | K H | - High fracture resistance in machining cast iron<br>- Suitable for hardened steel finish milling | ■ | | ■ | |
| BX870 | 3000 ~ 3200 | 0.95 ~ 1.20 | K | - High wear resistance<br>- Suitable for machining cylinder liners made of cast iron | ■ | | ■ | |
| BX470 | 4100 ~ 4300 | 1.90 ~ 2.10 | Sintered metal | - Excellent sharpness<br>- Suitable for machining ferrous sintered metal | ■ | | | |
| BX480 | 4100 ~ 4300 | 1.90 ~ 2.10 | Sintered metal | - Hardest grade of all T-CBN grades<br>- Suitable for machining ferrous sintered metal | ■ | | | |
| M714B | 3000 ~ 3200 | 1.00 ~ 1.10 | S | - High wear resistance and thermostability<br>- Good performance in high-speed machining of Inconel | ■ | | | |

# PCD (T-DIA)

| Grades | Grain size (μm) | Hard-ness (Hv) | T.R.S. (GPa) | Application | Feature | Turning | Grooving | Milling | Drilling |
|---|---|---|---|---|---|---|---|---|---|
| DX110 | < 1 | 8500 | 1.8 | N | - Excellent sharpness for high surface quality<br>- Suitable for finishing non-ferrous metal and nonmetal | | | | |
| DX120 | 4.5 | 9000 | 1.8 | N | - Suitable for precision machining of non-ferrous metal and nonmetal | | | | |
| DX140 | 12.5 | 10000 | 1.7 | N | - High wear resistance<br>- Suitable for machining non-ferrous metal and nonmetal | | | | |
| DX160 | 28 | 11000 | 1.6 | N | - Designed for machining ceramic, cemented carbide, and nonmetal | | | | |
| DX180 | 45 | 12000 | 1.5 | N | - High wear resistance<br>- Designed for ceramic, cemented carbide, and nonmetal | | | | |

# Uncoated Cemented Carbide

| Grades | Specific gravity | Hard-ness (HRA) | T.R.S. (GPa) | Application | Turning | Grooving | Milling | Drilling |
|---|---|---|---|---|---|---|---|---|
| UX30<br>P30<br>M30 | 12.6 | 91.1 | 2.3 | P M | | | | |
| TH10<br>P10<br>M10<br>K10<br>N10 | 14.7 | 92.0 | 2.4 | P M<br>K N | | | | |
| KS05F<br>K05<br>S05<br>N05 | 15.0 | 93.0 | 2.9 | K S<br>N | | | | |
| KS15F<br>N15 | 14.4 | 91.5 | 3.0 | N | | | | |
| KS20<br>K20<br>N20<br>S20 | 14.5 | 90.8 | 2.8 | K S<br>N | | | | |
| TH03<br>P05<br>M05<br>K05<br>N05 | 13.8 | 93.8 | 1.9 | P M<br>K N | | | | |
| F | 14.9 | 93.4 | 2.5 | P K | | | | |
| EM10<br>P10 - P25<br>K10 - K25 | 14 | 91.5 | 3.4 | P K | | | | |

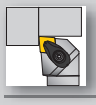
| Grades | Specific gravity | Hard-ness (HRA) | T.R.S. (GPa) | Application | Turning | Grooving | Milling | Drilling |
|---|---|---|---|---|---|---|---|---|
| UM<br>K10 - K25<br>N10 - N25 | 13.9 | 90.9 | 3.5 | K N | | | | |
| G2<br>K10 - K25<br>N10 - N25 | 15 | 90.8 | 2.7 | K N | | | | |
| G1F<br>P10 - P25<br>K10 - K25 | 15.1 | 92 | 2.6 | P K | | | | |
| MD10<br>P10 - P25<br>M10 - M25 | 15 | 92.8 | 3.4 | P M | | | | |
| MD20<br>P20 - P35<br>M20 - M35 | 14.4 | 91.5 | 3.9 | P M | | | | |

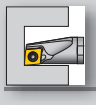
# TurnLine

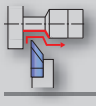


# TURNING
2016 / 2017


 Insert B002

 External Toolholder B180

 Internal Toolholder B262

 Miniature Machining B318

 Threading B376



## Negative type

Coated grades CVD/PVD, Cermet, Uncoated cemented carbides, Ceramic

B050



## Posivite type

Coated grades CVD/PVD, Cermet, Uncoated cemented carbides, Ceramic

B104



## CBN/PCD Insert

CBN (T-CBN), PCD (T-DIA)

B158


08

# TurnLine - Designation system for Insert

● Conforms to “Indexable Inserts for Cutting Tools - Designation” (JIS B4120-1998, and ISO 1832 / AM1-1998)

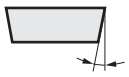
## ① Shape

| Symbol | Shape | Nose angle (degree) | Figure |
|---|---|---|---|
| H | Hexagonal | 120° | |
| O | Octagonal | 135° | |
| P | Pentagonal | 108° | |
| S | Square | 90° | |
| T | Triangular | 60° | |
| C | Rhombic | 80° | |
| D | | 55° | |
| E | | 75° | |
| F | | 50° | |
| G | G-shape (Tungaloy's symbol) | 70° | |
| M | Rhombic | 86° | |
| V | | 35° | |
| Y | Y-shape (Tungaloy's symbol) | 25° | |
| W | Trigon | 80° | |
| L | Rectangular | 90° | |
| A | Parallelogram | 85° | |
| B | | 82° | |
| K | | 55° | |
| R | Round | - | |

Notes : With respect to the nose angles of rhombic and parallelogram shaped inserts, use the smaller angle respectively.

## ② Relief angle

| Symbol | Relief angle |
|---|---|
| A | 3° |
| B | 5° |
| C | 7° |
| D | 15° |
| E | 20° |
| F | 25° |
| G | 30° |
| N | 0° |
| P | 11° |
| O | Others |
| X | Special |



## ③ Accuracy

| Symbol (class) | Tolerance (mm) | | |
|---|---|---|---|
| | Corner height (m) | Thickness (s) | I. C. dia. (ød) |
| A | ±0.005 | ±0.025 | ±0.025 |
| F | ±0.005 | ±0.025 | ±0.013 |
| C | ±0.013 | ±0.025 | ±0.025 |
| H | ±0.013 | ±0.025 | ±0.013 |
| E | ±0.025 | ±0.025 | ±0.025 |
| G | ±0.025 | ±0.13 | ±0.025 |
| J | ±0.005 | ±0.025 | ±0.005 ~ ±0.13 |
| K | ±0.013 | ±0.025 | ±0.05 ~ ±0.13 |
| L | ±0.025 | ±0.025 | ±0.05 ~ ±0.13 |
| M | ±0.08 ~ ±0.18 | ±0.13 | ±0.05 ~ ±0.13 |
| N | ±0.08 ~ ±0.18 | ±0.025 | ±0.05 ~ ±0.13 |
| U | ±0.13 ~ ±0.38 | ±0.13 | ±0.08 ~ ±0.25 |

| | ① | ② | ③ | ④ | ⑤ |
|---|---|---|---|---|---|
| [Example] | T | N | M | G | 16 |
| [Example] | C | C | G | T | 09 |

## ④ Groove and hole

| Symbol | Hole | Shape of hole | Chip-breaker | Shape |
|---|---|---|---|---|
| N | Without | - | Without | |
| R | | | Single-sided | |
| F | | | Double-sided | |
| A | With | Cylindrical hole | Without | |
| M | | | Single-sided | |
| G | | | Double-sided | |
| W | | Partly cylindrical hole, single-side 40° ~ 60° Counter sink | Without | |
| T | | | Single-sided | |
| Q | | Partly cylindrical hole, double-side 40° ~ 60° Counter sink | Without | |
| U | | | Double-sided | |
| B | | Partly cylindrical hole, single-side 70° ~ 90° Counter sink | Without | |
| H | | | Single-sided | |
| C | | Partly cylindrical hole, double-side 70° ~ 90° Counter sink | Without | |
| J | | | Double-sided | |
| X | - | - | - | |

## ⑤ Cutting edge length

| * R | | S | | C | | W | | T | | D | | V | | K | | I. C.dia. (mm) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Symbol | Length | Symbol | Length | Symbol | Length | Symbol | Length | Symbol | Length | Symbol | Length | Symbol | Length | Symbol | Length | |
| | | 03 | 3.97 | 03 | 4.0 | | | 06 | 6.9 | 04 | 4.8 | | | | | 3.97 |
| | | 04 | 4.76 | 04 | 4.8 | | | 08 | 8.2 | 05 | 5.8 | 08 | 8.3 | | | 4.76 |
| *05 | 5 | – | – | – | – | – | – | – | – | – | – | – | – | – | – | 5 |
| | | 05 | 5.56 | 05 | 5.6 | 03 | 3.8 | 09 | 9.6 | 06 | 6.8 | | | | | 5.56 |
| *06 | 6 | – | – | – | – | – | – | – | – | – | – | – | – | – | – | 6 |
| | | 06 | 6.35 | 06 | 6.5 | 04 | 4.3 | 11 | 11 | 07 | 7.8 | 11 | 11.2 | | | 6.35 |
| | | 07 | 7.94 | 08 | 8.1 | 05 | 5.4 | 13 | 13.8 | 09 | 9.7 | | | | | 7.94 |
| *08 | 8 | – | – | – | – | – | – | – | – | – | – | – | – | – | – | 8 |
| 09 | 9.525 | 09 | 9.525 | 09 | 9.7 | 06 | 6.5 | 16 | 16.5 | 11 | 11.6 | 16 | 16.6 | 16 | 19.7 | 9.525 |
| *10 | 10 | – | – | – | – | – | – | – | – | – | – | – | – | – | – | 10 |
| *12 | 12 | – | – | – | – | – | – | – | – | – | – | – | – | – | – | 12 |
| 12 | 12.7 | 12 | 12.7 | 12 | 12.9 | 08 | 8.7 | 22 | 22 | 15 | 15.5 | 22 | 22.1 | | | 12.7 |
| 15 | 15.875 | 15 | 15.875 | 16 | 16.1 | 10 | 10.9 | 27 | 27.5 | 19 | 19.4 | | | | | 15.875 |
| *16 | 16 | – | – | – | – | – | – | – | – | – | – | – | – | – | – | 16 |
| 19 | 19.05 | 19 | 19.05 | 19 | 19.3 | 13 | 13 | 33 | 33 | 23 | 23.3 | | | | | 19.05 |
| *20 | 20 | – | – | – | – | – | – | – | – | – | – | – | – | – | – | 20 |
| | | 22 | 22.225 | 22 | 22.6 | | | 38 | 38.5 | 27 | 27.1 | | | | | 22.225 |
| *25 | 25 | – | – | – | – | – | – | – | – | – | – | – | – | – | – | 25 |
| 25 | 25.4 | 25 | 25.4 | 25 | 25.8 | | | 44 | 44 | 31 | 31 | | | | | 25.4 |
| 31 | 31.75 | 31 | 31.75 | 32 | 32.2 | | | 55 | 55 | 38 | 38.8 | | | | | 31.75 |
| *32 | 32 | – | – | – | – | – | – | – | – | – | – | – | – | – | – | 32 |

*When M0 is included in Designation, the inscribed-circle diameter is metric size.

● Detailed accuracy for J,K,L,M,N and U classes

For inserts with nose corner angles larger than 55°

Unit: mm

| Inscribed circle | Tolerance on inscribed circle dia. (ød) | | Tolerance on corner height (m) | | Insert shapes applied |
|---|---|---|---|---|---|
| | J,K,L,M,N (class) | U (class) | J,K,L,M,N (class) | U (class) | |
| 6.35 | ±0.05 | ±0.08 | ±0.08 | ±0.13 | H W O R P S T C,E,M |
| 9.525 | | | | | |
| 12.7 | ±0.08 | ±0.13 | ±0.13 | ±0.2 | |
| 15.875 | ±0.1 | ±0.18 | ±0.15 | ±0.27 | |
| 19.05 | | | | | |
| 25.4 | ±0.13 | ±0.25 | ±0.18 | ±0.38 | |
| 31.75 | ±0.15 | ±0.25 | ±0.2 | ±0.38 | |
| 32 | | | | | |

For M-type inserts with nose corner angles of 55° (Shape: D), 35° (Shape: V), 25° (Shape: Y)

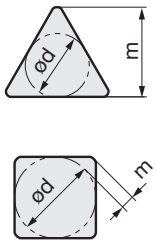
Unit: mm

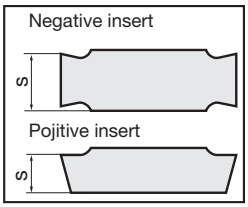
| Inscribed circle | Tolerance on inscribed circle dia. (ød) | Tolerance on corner height (m) | Insert shapes applied |
|---|---|---|---|
| 6.35 | ±0.05 | ±0.11 | D |
| 9.525 | | | |
| 12.7 | ±0.08 | ±0.15 | |
| 15.875 | ±0.1 | ±0.18 | |
| 19.05 | | | |
| 6.35 | ±0.05 | ±0.16 | V |
| 9.525 | | | Y |

Note on insert thickness

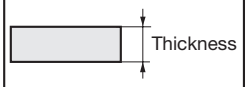
With regard to the insert thickness for chipbreaker inserts, the thickness (s) drawn in the outlined insert shapes on pages XX to XX is defined as "s" (height from the bottom face to the cutting edge) shown in the figure at right.

Inscribed circle (ød)
Corner height (m)




| Symbol | Thickness (mm) |
|---|---|
| X1 | 1.39 |
| 01 | 1.59 |
| T1 | 1.98(1.79) |
| 02 | 2.38 |
| T2 | 2.78 |
| 03 | 3.18 |
| T3 | 3.97 |
| 04 | 4.76 |
| 05 | 5.56 |
| 06 | 6.35 |
| 07 | 7.94 |
| 09 | 9.52 |




**⑥ Thickness**

Insert

[Example]

| ⑥ | ⑦ | | | | ⑩ |
|---|---|---|---|---|---|
| 04 | 08 | | | - | TM |
| T3 | 04 | F | N | - | JS |
| ⑥ | ⑦ | ⑧ | ⑨ | | ⑩ |

(Optional symbol) (Optional symbol) (Supplementary symbol)

**⑦ Corner radius**



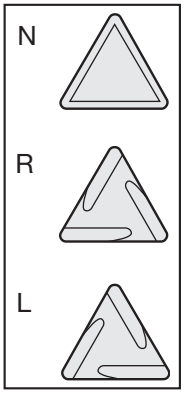

| Symbol | Corner radius $r_\varepsilon$ (mm) |
|---|---|
| 00 | 0.03 |
| 02 | 0.2 |
| 04 | 0.4 |
| 08 | 0.8 |
| 12 | 1.2 |
| 16 | 1.6 |
| 20 | 2.0 |
| 24 | 2.4 |
| 28 | 2.8 |
| 32 | 3.2 |

**⑧ Symbols of major cutting edge**

| Symbol | Condition of cutting edge | Shape |
|---|---|---|
| F | Sharp edge | |
| E | Honed rounded edge | |
| W.T | Honed chamfered edge | |
| S | Combination honed edge | |

**⑨ Hand of insert**

| Symbol | Hand |
|---|---|
| R | Right |
| L | Left |
| N | Neutral |




**⑩ Chipbreakers**

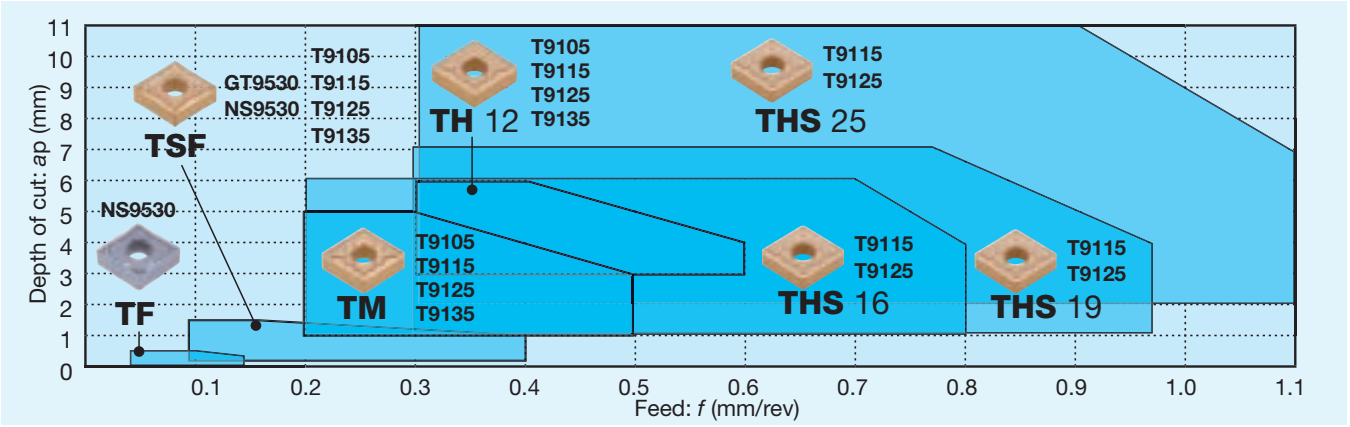
| Symbol | Applications | Symbol | Applications |
|---|---|---|---|
| 01(TF) | Precision finishing (Basic selection) | CB | Medium cutting |
| TS | Finishing (Basic selection) | CM | Medium cutting of cast irons |
| TSF | Finishing (Basic selection) | All-round | Medium cutting |
| TM | Medium cutting (Basic selection) | A | Finishing (Right and left hand) |
| THS | Medium to heavy cutting (Basic selection) | B | Finishing (Right and left hand) |
| TRS | Medium to heavy cutting | C | Finishing (Right and left hand) |
| TUS | Heavy cutting | D | Finishing (Right and left hand) |
| DM | Medium cutting | P | Finishing of Aluminium alloys |
| HRF | Finishing | W | Finishing (Angular type) |
| HRM | Finishing to medium cutting | PSF | Finishing (Positive type) |
| HMM | Medium cutting | PSS | Finishing to light cutting (Positive insert) |
| SF | Finishing of stainless steels | PS | Finishing to medium cutting (Positive type Basic selection) |
| SS | Finishing of stainless and mild steels | PM | Medium cutting (Positive type) |
| SM | Medium cutting of stainless steels | AL | Finishing to medium cutting of aluminium alloys |
| S | Medium cutting of stainless steels | RS | Medium cutting (For round inserts) |
| SH | Medium to heavy cutting of stainless steels | W□□ | Finishing (Angular type) |
| SA | For heat-resisting alloys and stainless steels | H□□ | Finishing (Parallel) |
| ZF | Finishing and copying | 11 | Finishing |
| ZM | Finishing to medium cutting and copying | 61 | Small depth of cut and high feed (For round inserts) |
| NS | Finishing and copying | S1 | Finishing (For KNMX type) |
| NM | Finish to medium cutting and copying | J08,J10 | For small lathes |
| AS | Small depth of cut and high feed | JS | For small lathes |
| AM | Small depth of cut and high feed | JRP | For small lathes |
| FW | Finishing (Wiper type) | JPP | For small lathes |
| SW | Finishing to medium cutting (Wiper type) | JSP | For small lathes |
| AFW | Small depth of cut and high feed (Wiper type Inserts) | | |
| ASW | Small depth of cut and high feed (Wiper type Inserts) | | |

# TurnLine - Chipbreaker Guide

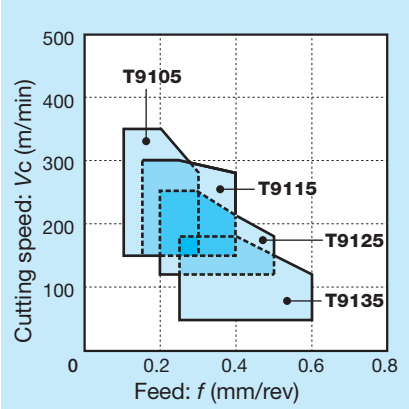
## BASIC CHIPBREAKERS: NEGATIVE INSERTS

## P Steel

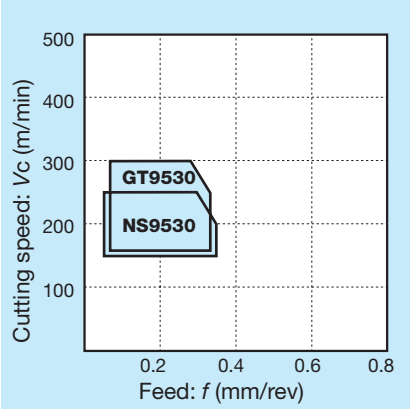
### Chipbreaker System for Turning (Negative Inserts)

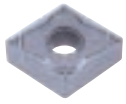



### CVD coated grades




### Coated cermets / Cermets




| Chipbreaker | Appearance | Features |
|---|---|---|
| TF |  | The sharp cutting edge and raised projection near corner contribute to excellent chip control at very small depths of cut and low feeds. Economical M-class tolerance and low cost. |
| TSF |  | First choice chipbreaker for finishing steels. The dimple structure decreases the contact area between the insert surface and chips, resulting in significant reduction of heat occurrence. |

| Chipbreaker | Appearance | Features |
|---|---|---|
| TM |  | General purpose chipbreaker used for medium cutting. Unique chipbreaker geometry with sharp edges and large rake angle assures free cutting action in a wide range of cutting conditions. |
| TH |  | Double-sided 3-dimensional chipbreaker with a wide land and broad groove used for medium to heavy cutting including interruption and unfavorable surface conditions. Also performs well in high feed machining. |
| THS |  | Excellent chip control in a broad range of depth of cut. Strong cutting edge being suitable for interrupted and high feed operations. |

## STANDARD CUTTING CONDITIONS

| ISO | Operation | Work condition | Chip-breaker | Grade | Depth of cut *ap* (mm) | Feed *f* (mm/rev) | Cutting speed: *Vc* (m/min) Low carbon steels, Alloy steels | Medium carbon steels, Alloy steels | High carbon steels, Alloy steels |
|---|---|---|---|---|---|---|---|---|---|
| P | Precision finishing | Continuous to light interrupted | TF | NS9530 | 0.05 - 0.5 | 0.03 - 0.15 | 150 - 250 | 100 - 250 | 100 - 200 |
| | Finishing | Continuous to light interrupted | TSF | GT9530 | 0.2 - 1.5 | 0.08 - 0.4 | 150 - 300 | 80 - 250 | 80 - 200 |
| | | Heavy interrupted | TSF | T9125 | 0.2 - 1.5 | 0.08 - 0.4 | 120 - 250 | 80 - 200 | 80 - 150 |
| | Medium cutting | Continuous to heavy interrupted | TM | T9105 | 1.0 - 5.0 | 0.2 - 0.5 | 180 - 350 | 180 - 350 | 180 - 300 |
| | | | TM | T9115 | 1.0 - 5.0 | 0.2 - 0.5 | 150 - 300 | 150 - 300 | 120 - 250 |
| | | | TM | T9125 | 1.0 - 5.0 | 0.2 - 0.5 | 120 - 250 | 80 - 200 | 80 - 150 |
| | | | TM | T9135 | 1.0 - 5.0 | 0.2 - 0.5 | 50 - 180 | 50 - 150 | 50 - 120 |
| | Medium to heavy cutting | Continuous to heavy interrupted | TH | T9105 | 3.0 - 6.0 | 0.3 - 0.6 | 180 - 350 | 180 - 350 | 180 - 300 |
| | | | TH | T9115 | 3.0 - 6.0 | 0.3 - 0.6 | 150 - 300 | 150 - 300 | 120 - 250 |
| | | | TH | T9125 | 3.0 - 6.0 | 0.3 - 0.6 | 120 - 250 | 80 - 200 | 80 - 150 |
| | | | TH | T9135 | 3.0 - 6.0 | 0.3 - 0.6 | 50 - 180 | 50 - 150 | 50 - 120 |

Low carbon steels, Alloy steels: C10, 18CrMo4, E275A, 20Cr4, etc. Medium carbon steels, Alloy steels: C45, 42CrMo4, etc.
High carbon steels, Alloy steels: 41CrNiMo2, etc.

SELECTION SYSTEM: NEGATIVE INSERTS

## P Steel







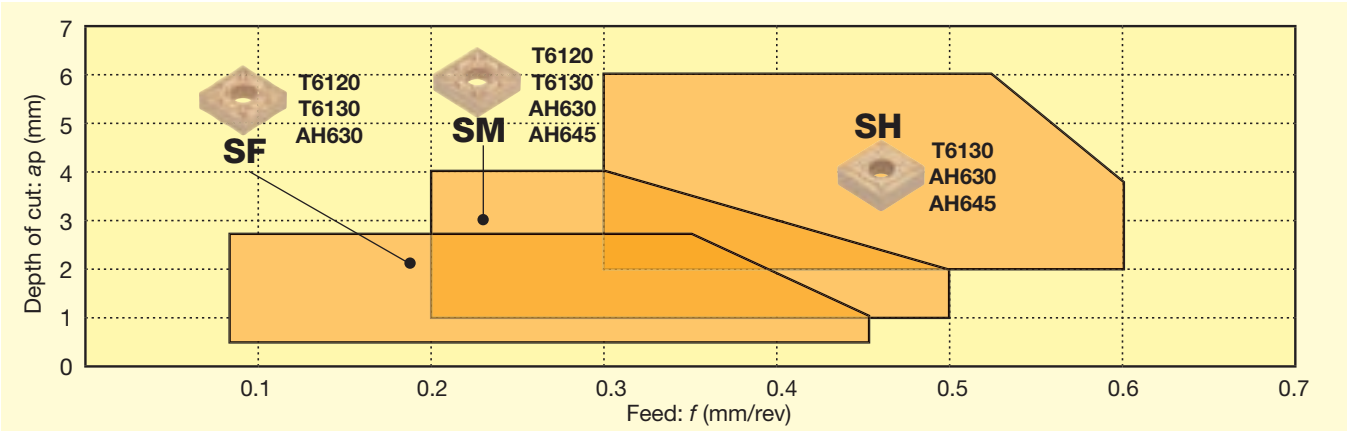
| | Continuous | Light interrupted | Heavy interrupted |
|---|---|---|---|
| Precision finishing [ $a_p$ = ~ 0.5 mm ] | Basic: TF NS9530 → Wear: 01 GT9530 | Basic: TF NS9530 → Fracture: TSF GT9530 | |
| Finishing [ $a_p$ = 0.3 ~ 1.5 mm ] | Basic: TSF GT9530 → Chip control: ZF GT9530 | Basic: TSF GT9530 → Fracture: TSF T9115 | Basic: TSF T9125 → Fracture: TSF T9135 |
| Medium cutting [ $a_p$ = 1.0 ~ 4.0 mm ] | Basic: TM T9115 → Wear: TM T9105; Chip control: ZM T9115 | Basic: TM T9125 → Fracture: TM T9135; Wear: TM T9115 | Basic: TM T9135 → Fracture: DM T9135 |
| Medium to heavy cutting [ $a_p$ = 3.0 ~ 6.0 mm ] | Basic: TH T9115 → Wear: TH T9105; Chip control: TM T9115 | Basic: TH T9125 → Fracture: TH T9135; Wear: TH T9115 | Basic: TH T9135 → Fracture: TUS T9135 |

# TurnLine - Chipbreaker Guide

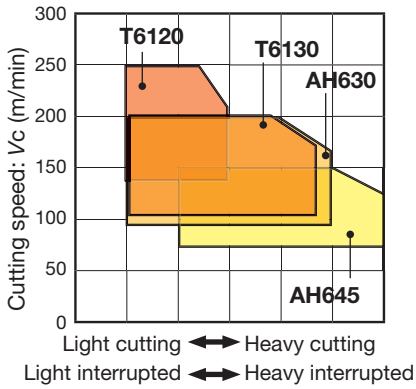
## BASIC CHIPBREAKERS: NEGATIVE INSERTS

## M Stainless Steel

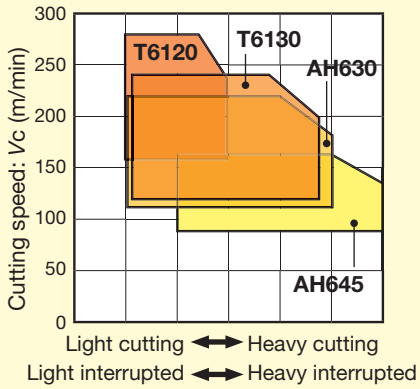
### Chipbreaker System for Turning



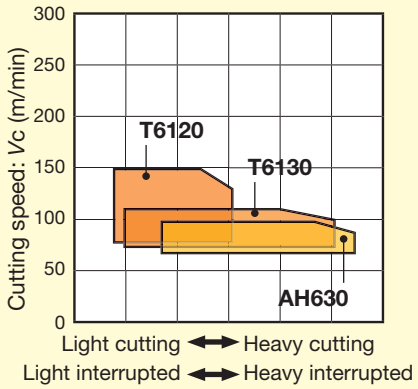

Austenitic stainless steel

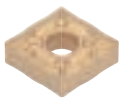
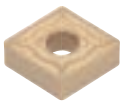



Ferritic / martensite stainless steel




Precipitation hardened stainless steel




| Chipbreaker | Appearance | Features |
|---|---|---|
| SF |  | Exellent chip control when finish cutting.<br>Outstanding chip control when high feed turning at small depth of cut. |
| SH |  | Suitable for roughing operations and interrupted machining with tough cutting edges. |

| Chipbreaker | Appearance | Features |
|---|---|---|
| SM |  | Applicable to a wide range of cutting condition with sharp edge.<br>Recommended chipbreaker for stainless steel turning. |

## STANDARD CUTTING CONDITIONS

| ISO | Operation | Work condition | Chipbreaker | Grade | Depth of cut *ap* (mm) | Feed *f* (mm/rev) | Cutting speed *Vc* (m/min) |
|---|---|---|---|---|---|---|---|
| M | Finishing | Continuous | SF | T6120 | 0.5 - 2.5 | 0.08 - 0.45 | 140 - 240 |
| | | Continuous to light interrupted | SF | T6130 | 0.5 - 2.5 | 0.08 - 0.45 | 100 - 200 |
| | | Heavy interrupted | SF | AH630 | 0.5 - 2.5 | 0.08 - 0.45 | 90 - 190 |
| | Medium cutting | Continuous | SM | T6120 | 1.0 - 4.0 | 0.2 - 0.5 | 140 - 240 |
| | | Continuous to light interrupted | SM | T6130 | 1.0 - 4.0 | 0.2 - 0.5 | 100 - 200 |
| | | Light interrupted | SM | AH630 | 1.0 - 4.0 | 0.2 - 0.5 | 90 - 190 |
| | | Heavy interrupted | SM | AH645 | 1.0 - 4.0 | 0.2 - 0.5 | 70 - 150 |
| | Medium to heavy cutting | Continuous to light interrupted | SH | T6130 | 2.0 - 6.0 | 0.3 - 0.6 | 100 - 200 |
| | | Light interrupted | SH | AH630 | 2.0 - 6.0 | 0.3 - 0.6 | 90 - 190 |
| | | Heavy interrupted | SH | AH645 | 2.0 - 6.0 | 0.3 - 0.6 | 70 - 150 |

Stainless steels: X5CrNi18-9, X5CrNiMo17-12-3, etc.

SELECTION SYSTEM: NEGATIVE INSERTS

# M Stainless Steel





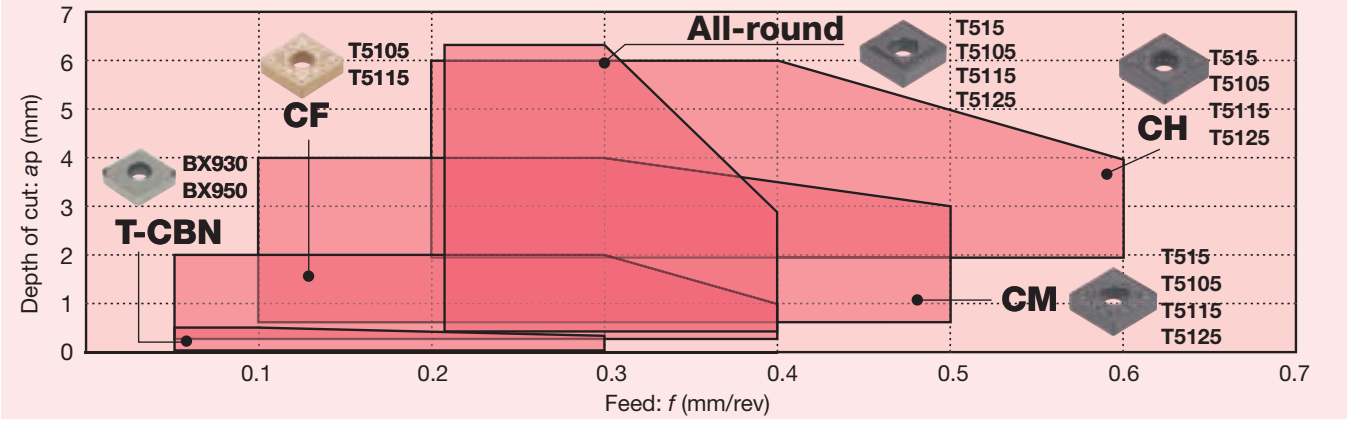


| | Continuous | Light interrupted | Heavy interrupted |
|---|---|---|---|
| **Finishing** [ $a_p$ = 0.5 ~ 1.5 mm ] | Basic: **SM T6130**<br>Wear → **SM T6120**<br>Chip control → **SF T6130** | Basic: **SM AH630**<br>Fracture → **SM AH645**<br>Wear → **SM T6130**<br>Chip control → **SF AH630** | Basic: **SM AH630**<br>Fracture → **SM AH645**<br>Chip control → **SF AH630** |
| **Medium cutting** [ $a_p$ = 1.0 ~ 4.0 mm ] | Basic: **SM T6130**<br>Wear → **SM T6120**<br>Chip control → **SF T6130** | Basic: **SM AH630**<br>Fracture → **SM AH645**<br>Wear → **SM T6130** | Basic: **SH AH630**<br>Fracture → **SH AH645** |
| **Medium to heavy cutting** [ $a_p$ = 2.0 ~ 6.0 mm ] | Basic: **SH AH630**<br>Wear → **SH T6130**<br>Chip control → **SM AH630** | Basic: **SH AH630**<br>Fracture → **SH AH645**<br>Wear → **SH T6130** | Basic: **SH AH630**<br>Fracture → **SH AH645** |

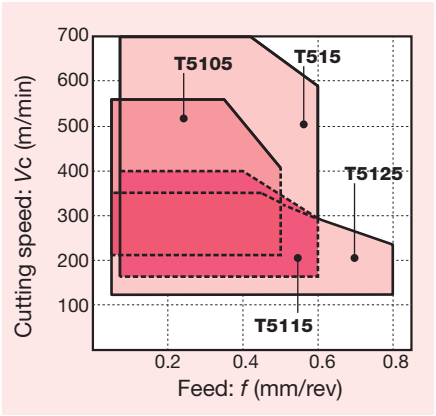
## BASIC CHIPBREAKERS: NEGATIVE INSERTS

# K Cast Iron

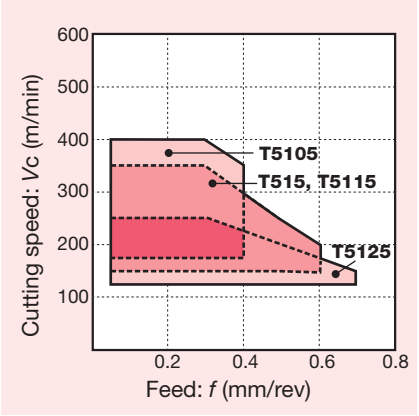
### Chipbreaker System for Turning (Negative Inserts)



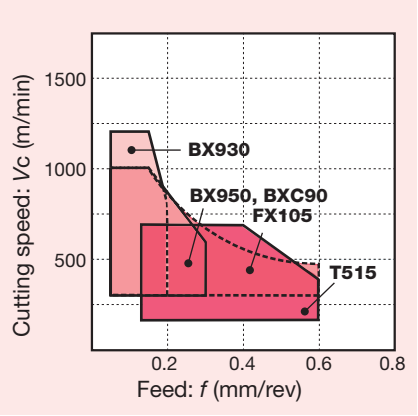

### Grey cast irons

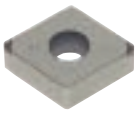
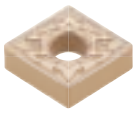
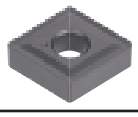


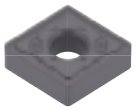

### Ductile cast irons




### High speed cutting: for grey cast irons




| Chip-breaker | Appearance | Features |
|---|---|---|
| No chip-breaker (T-CBN) |  | T-CBN inserts.<br>Performs well in high speed finishing of cast iron. |
| CF |  | Low cutting force chipbreaker for cast iron. Combined with an arc-shaped concave and a high rake (substantially 20° rake angle), allows drastically reducing cutting forces and suppressing the deformation of thin walled components and burr occurrence. |
| All-round |  | Highly reliable chipbreaker for medium cutting under a wide range of conditions from continuous to interrupted cutting. |

| Chip-breaker | Appearance | Features |
|---|---|---|
| CM |  | First choice chipbreaker for cast iron.<br>An all around chipbreaker, which is applicable for a wide range of cutting conditions from continuous to interrupted machining with the positive land and wide chip pocket |
| CH |  | Chipbreaker with reinforced cutting-edge for cast iron.<br>Utilizing the land support and negative land design, features stable insert seating and high cutting edge strength even in heavy cutting. |

## STANDARD CUTTING CONDITIONS

| ISO | Operation | Work condition | Chip-breaker | Grade | Depth of cut *ap* (mm) | Feed *f* (mm/rev) | Cutting speed: *Vc* (m/min) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Grey cast irons | Ductile cast irons |
| K | High speed cutting | Continuous | Without | BX930 | 0.05 - 0.5 | 0.05 - 0.2 | 300 - 1200 | 100 - 500 |
| | | Light interrupted | Without | BX950 | 0.05 - 0.5 | 0.05 - 0.3 | 300 - 1000 | 100 - 300 |
| | | Continuous | Without | BXC90 | 0.08 - 3.0 | 0.05 - 0.4 | 300 - 1000 | 100 - 300 |
| | Finishing | Continuous | CF | T5105 | 0.5 - 2.0 | 0.05 - 0.4 | 180 - 480 | 180 - 400 |
| | | Light interrupted | CF | T5115 | 0.5 - 2.0 | 0.05 - 0.4 | 140 - 400 | 140 - 370 |
| | Medium cutting | Continuous | CM | T5105 | 1.0 - 5.0 | 0.1 - 0.5 | 180 - 480 | 180 - 400 |
| | | Light interrupted | AR | T515 | 1.0 - 5.0 | 0.1 - 0.5 | 150 - 700 | 140 - 370 |
| | | Heavy interrupted | CM | T5125 | 1.0 - 5.0 | 0.1 - 0.5 | 120 - 300 | 120 - 250 |
| | Heavy cutting | Continuous | CH | T5105 | 3.0 - 6.0 | 0.2 - 0.6 | 180 - 480 | 180 - 400 |
| | | Light interrupted | CH | T515 | 3.0 - 6.0 | 0.2 - 0.6 | 150 - 700 | 140 - 370 |
| | | Heavy interrupted | CH | T5125 | 3.0 - 6.0 | 0.2 - 0.6 | 120 - 300 | 120 - 250 |

Grey cast irons: 250, etc.  Ductile cast irons: 450-10S, etc.

SELECTION SYSTEM: NEGATIVE INSERTS

# K Cast Iron







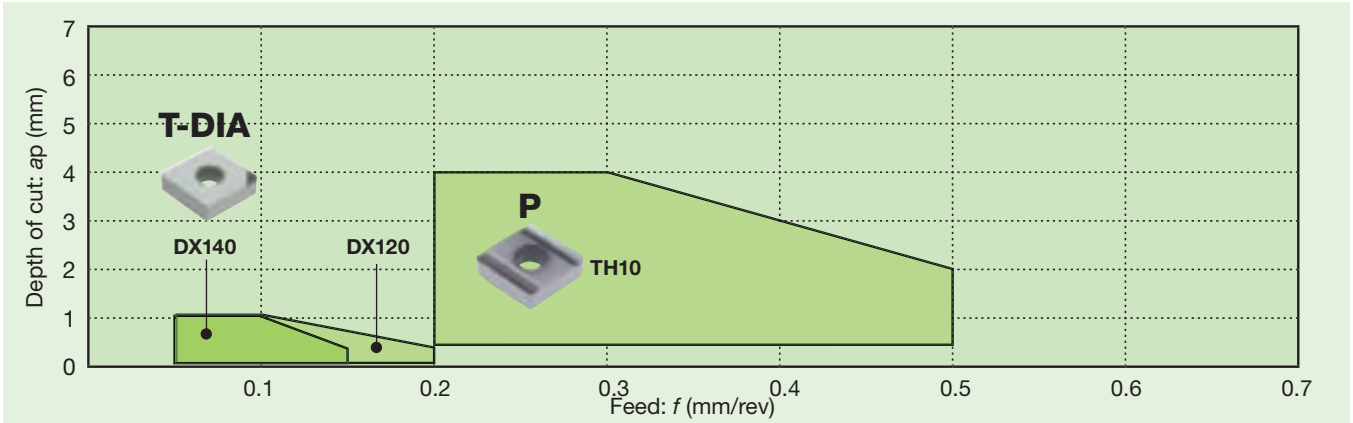
| | Continuous | Light interrupted | Heavy interrupted |
|---|---|---|---|
| Finishing [ $a_p$ = 0.5 ~ 2.0 mm ] | Basic: All-round T515 → Wear: All-round T5105; Burr occurrence: CF T5105 | Basic: All-round T515 → Wear: All-round T5105; Fracture: CH T515; Burr occurrence: CF T5115 | Basic: CH T515 → Wear: CH T5105; Fracture: CH T5125; Burr occurrence: All-round T515 |
| Medium cutting [ $a_p$ = 1.0 ~ 5.0 mm ] | Basic: All-round T515 → Wear: All-round T5105; Burr occurrence: CF T5105 | Basic: All-round T515 → Wear: All-round T5105; Fracture: CH T515; Burr occurrence: CF T5115 | Basic: CH T515 → Wear: CH T5105; Fracture: CH T5125; Burr occurrence: All-round T515 |
| Medium to heavy cutting [ $a_p$ = 3.0 ~ 6.0 mm ] | Basic: All-round T515 → Wear: All-round T5105; Burr occurrence: CF T5105 | Basic: All-round T515 → Wear: All-round T5105; Fracture: CH T515; Burr occurrence: CF T5115 | Basic: CH T515 → Wear: CH T5105; Fracture: CH T5125; Burr occurrence: All-round T515 |

# TurnLine - Chipbreaker Guide

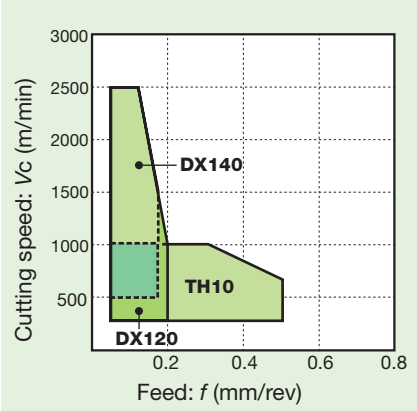
## BASIC CHIPBREAKERS: NEGATIVE INSERTS

## N Non-ferrous Metal

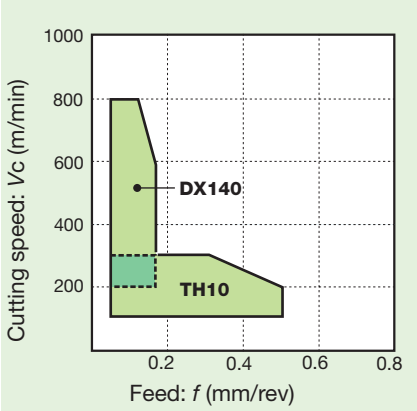
### Chipbreaker System for Turning (Negative Inserts)



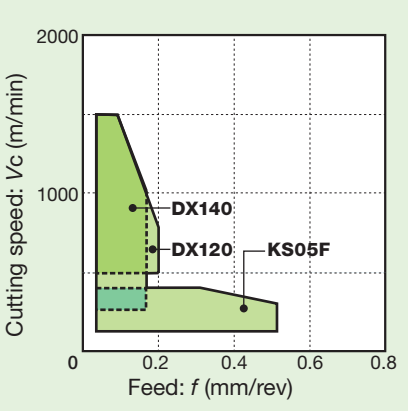

### Aluminium alloys (Si < 12%)

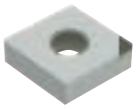
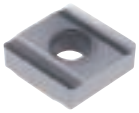


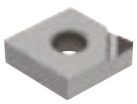

### Aluminium alloys (Si ≥ 12%)




### Copper alloys




| Chip-breaker | Appearance | Features |
|---|---|---|
| No chip-breaker (T-DIA) |  | Performs well in high speed finishing of non-ferrous materials. |
| P |  | Excels in sharpness of cutting edges and effectively used for machining non-ferrous metals such as aluminium alloys and copper alloys. |

| Chip-breaker | Appearance | Features |
|---|---|---|
| With chip-breaker (T-DIA) |  | The wide chipbreaker width contributes to excellent chip control. |

## STANDARD CUTTING CONDITIONS

| ISO | Operation | Work condition | Chip-breaker | Grade | Depth of cut *ap* (mm) | Feed *f* (mm/rev) | Cutting speed: *Vc* (m/min) Aluminium alloys (Si < 12%) | Aluminium alloys (Si > 12%) | Copper alloys |
|---|---|---|---|---|---|---|---|---|---|
| N | Precision finishing | Continuous | With | DX120 | 0.05 - 1.0 | 0.05 - 0.15 | 500 - 2500 | 400 - 800 | 500 - 1500 |
| | | Light interrupted | Without | DX140 | 0.05 - 1.0 | 0.05 - 0.20 | 300 - 2500 | - | 500 - 1500 |
| | Finishing | Continuous | Without | DX140 | 0.05 - 1.0 | 0.05 - 0.15 | 500 - 2500 | 400 - 800 | 500 - 1500 |
| | | Light interrupted | Without | DX140 | 0.05 - 1.0 | 0.05 - 0.15 | 300 - 1800 | 400 - 600 | 400 - 1200 |
| | | Heavy interrupted | P | TH10 | 0.5 - 4.0 | 0.2 - 0.5 | 100 - 500 | 100 - 200 | 100 - 200 |
| | Medium cutting | Continuous | P | TH10 | 0.5 - 4.0 | 0.2 - 0.5 | 100 - 1000 | 100 - 300 | 100 - 300 |
| | | Light interrupted | P | TH10 | 0.5 - 4.0 | 0.2 - 0.5 | 100 - 800 | 100 - 200 | 100 - 200 |
| | | Heavy interrupted | P | TH10 | 0.5 - 4.0 | 0.2 - 0.5 | 100 - 500 | 100 - 200 | 100 - 200 |

SELECTION SYSTEM: NEGATIVE INSERTS

# N Non-ferrous Metal





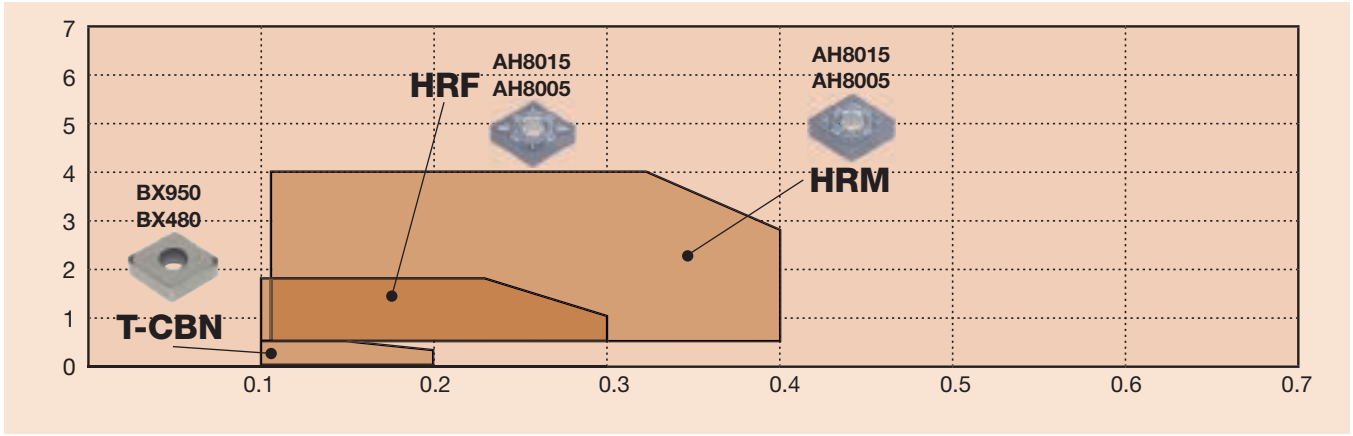


| | Continuous | Light interrupted | Heavy interrupted |
|---|---|---|---|
| Precision finishing [ $a_p$ = ~ 0.5 mm ] | Basic: T-DIA DX140 → Wear: T-DIA DX160 | Basic: T-DIA DX140 → Surface: With chipbreaker T-DIA DX120; Wear: T-DIA DX160 | |
| Finishing [ $a_p$ = 0.5 ~2.0 mm ] | Basic: T-DIA DX140 → Surface: With chipbreaker T-DIA DX120; Wear: T-DIA DX160 | Basic: T-DIA DX140 → Fracture: P TH10; Wear: T-DIA DX160 | Basic: P TH10 |
| Medium cutting [ $a_p$ = 1.0 ~ 4.0 mm ] | Basic: P TH10 → Wear: T-DIA DX140 | Basic: P TH10 → Wear: T-DIA DX140 | Basic: P TH10 |

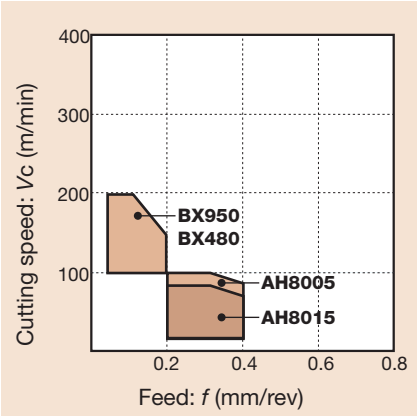
## BASIC CHIPBREAKERS: NEGATIVE INSERTS

# S Superalloys and titanium

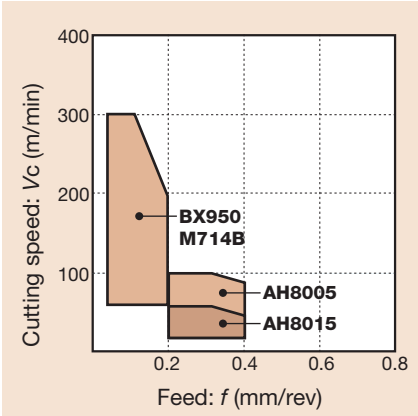
### Chipbreaker System for Turning (Negative Inserts)



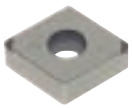

### Titanium alloys




### Ni-base alloys




| Chipbreaker | Appearance | Features |
|---|---|---|
| HRF |  | Suitable for finishing operation of superalloys. Special protrusion provides excellent chip control in lower depth of cut. |
| HRM |  | The 1st recommended chipbreaker for supperalloy turning. Optimized geometry provides stable chip control in various depth of cut. |

| Chipbreaker | Appearance | Features |
|---|---|---|
| No chip-breaker (T-CBN) |  | T-CBN inserts.<br>Performs well in finishing of heat-resistant or titanium alloys. |

## STANDARD CUTTING CONDITIONS

| ISO | Operation | Work condition | Chip-breaker | Grade | Depth of cut *ap* (mm) | Feed *f* (mm/rev) | Cutting speed: *Vc* (m/min) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Titanium alloys | Ni-base alloys |
| S | Precision finishing | Continuous | Without | BX950 | 0.1 - 0.5 | 0.05 - 0.2 | 100 - 200 | 70 - 300 |
| | | | Without | M714B | 0.1 - 0.5 | 0.05 - 0.2 | - | 70 - 400 |
| | | Light interrupted | Without | BX480 | 0.1 - 0.5 | 0.05 - 0.2 | 100 - 200 | - |
| | Finishing | Continuous | HRF | AH8005 | 0.5 - 1.5 | 0.05 - 0.25 | 20 - 100 | 20 - 100 |
| | | Light interrupted | HRF | AH8015 | 0.5 - 1.5 | 0.05 - 0.25 | 20 - 80 | 20 - 50 |
| | | Heavy interrupted | HRF | AH8015 | 0.5 - 1.5 | 0.05 - 0.25 | 10 - 60 | 10 - 40 |
| | Finishing to Medium cutting | Continuous | HRM | AH8005 | 0.5 - 4.0 | 0.1 - 0.4 | 20 - 100 | 20 - 100 |
| | | Light interrupted | HRM | AH8015 | 0.5 - 4.0 | 0.1 - 0.4 | 20 - 80 | 20 - 50 |
| | | Heavy interrupted | HRM | AH8015 | 0.5 - 4.0 | 0.1 - 0.4 | 10 - 60 | 10 - 40 |

Ni-base alloys: INCONEL718, etc.
Titanium alloys: Ti-6Al-4V, etc

SELECTION SYSTEM: NEGATIVE INSERTS

# S Superalloys and titanium





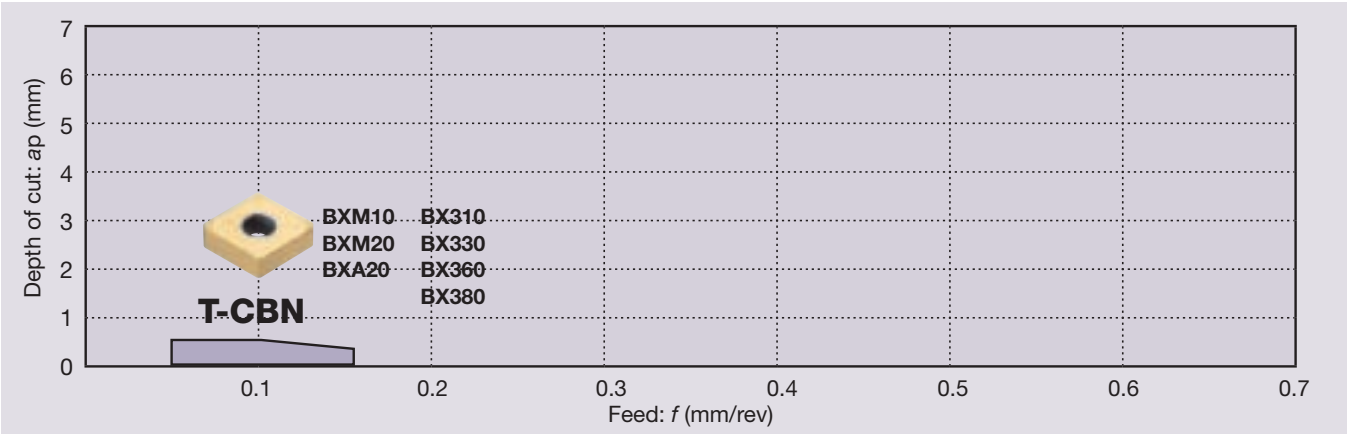


| | Continuous | Light interrupted | Heavy interrupted |
|---|---|---|---|
| **Precision finishing** [ $a_p$ = ~ 0.5 mm ] | Basic → **T-CBN BX950** | Basic → **T-CBN BX950**; Fracture → No chipbreaker **TH10** | |
| **Finishing** [ $a_p$ = 0.5 ~ 1.5 mm ] | Basic → **HRF AH8015**; Wear → **HRF AH8005** | Basic → **HRF AH8015**; Fracture → **HRM AH8015**; Wear → **HRF AH8005** | Basic → **HRF AH8015**; Fracture → **HRM AH8015**; Wear → **HRF AH8005** |
| **Medium cutting** [ $a_p$ = 0.5 ~ 4.0 mm ] | Basic → **HRM AH8015**; Wear → **HRM AH8005**; Chip control → **HRF AH8015** | Basic → **HRM AH8015**; Fracture → **SM AH630**; Wear → **HRM AH8005** | Basic → **HRM AH8015**; Fracture → **SM AH630**; Wear → **HRF AH8005** |

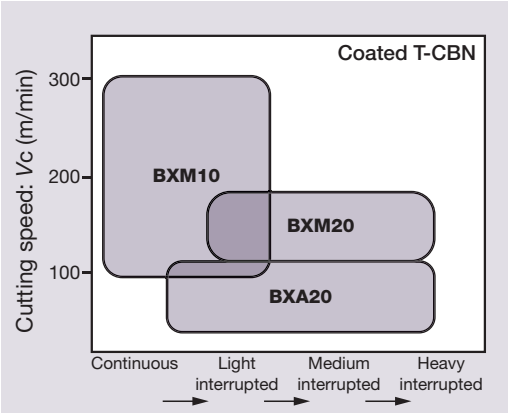
## BASIC CHIPBREAKERS: NEGATIVE INSERTS

# H Hard Materials

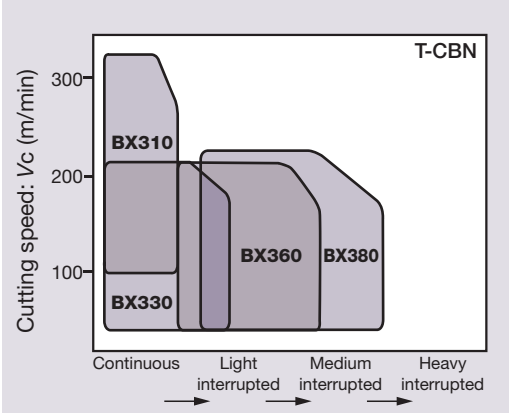
### Chipbreaker System for Turning (Negative Inserts)



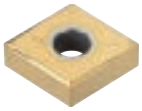

**Coated T-CBN**




**T-CBN**




| Chipbreaker | Appearance | Features |
|---|---|---|
| No chip-breaker (T-CBN) |  | Performs well in finishing of hardened steel. |

| Chipbreaker | Appearance | Features |
|---|---|---|
| HF |  | When used in removing a carburized layer, excels in chip control at small depth of cut. |
| HM |  | When used in removing a carburized layer, excels in chip control at large depth of cut. |

## STANDARD CUTTING CONDITIONS

| ISO | Operation | Work condition | Chipbreaker | Grade | Depth of cut *ap* (mm) | Feed *f* (mm/rev) | Cutting speed *Vc* (m/min) |
|---|---|---|---|---|---|---|---|
| H | Precision finishing | Continuous to light interrupted | Without | BXM10 | 0.05 - 0.3 | 0.03 - 0.18 | 150 - 350 |
| | Finishing | Continuous to heavy interrupted | Without | BXM20<br>BXA20 | 0.05 - 0.3 | 0.05 - 0.25 | 70 - 220 |
| | Removing of carburized layer | Continuous | HF | BXM20 | 0.2 - 0.75 | 0.05 - 0.2 | 70 - 200 |
| | | Continuous | HM | BXM20<br>BXA20 | 0.5 - 1.0 | 0.05 - 0.2 | 70 - 200 |

Hardened steels, Pre-hardened steels: X153CrMoV12, X40CrMoV5-1, etc.

SELECTION SYSTEM: NEGATIVE INSERTS

# H Hard Materials





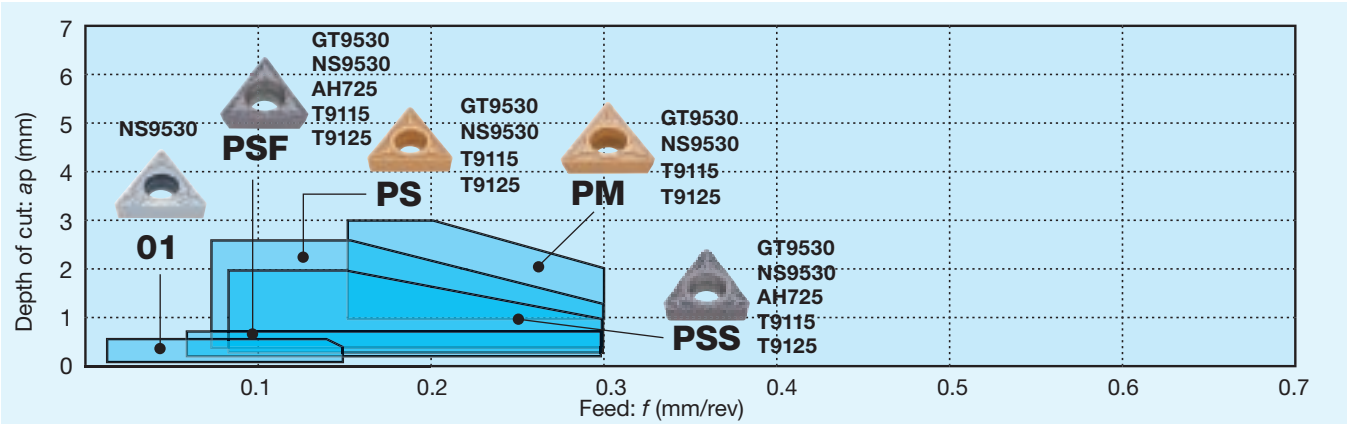


| | Continuous | Light interrupted | Heavy interrupted |
|---|---|---|---|
| Precision finishing [ $a_p$ = ~ 0.2 mm ] | Basic → T-CBN BXM10 | Basic → T-CBN BXM20<br>Fracture → T-CBN BXA20<br>For high speed Wear → T-CBN BXM10 | |
| Finishing [ $a_p$ = ~ 0.5 mm ] | Basic → T-CBN BXM10 | Basic → T-CBN BXM20<br>Fracture → -H BXM20<br>For high speed Wear → T-CBN BXM10 | Basic → T-CBN BXM20<br>Fracture → -H BXM20 |

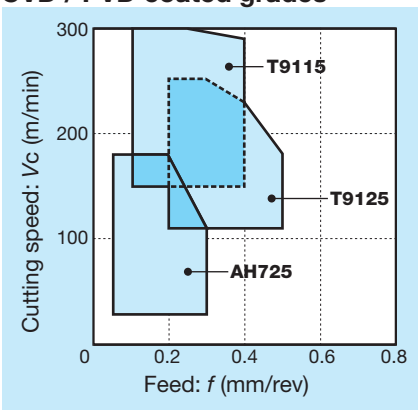
## BASIC CHIPBREAKERS: POSITIVE INSERTS

# P Steel

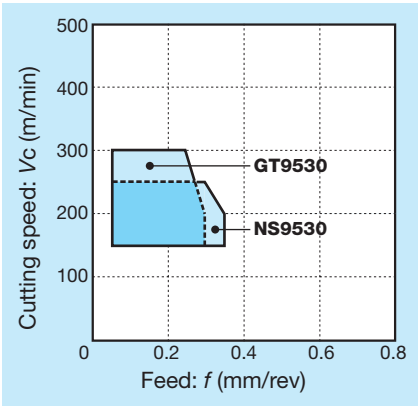
### Chipbreaker System for Turning (Positive Inserts)

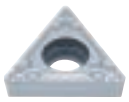



### CVD / PVD coated grades




### Coated cermets / Cermets




| Chipbreaker | Appearance | Features |
|---|---|---|
| 01 |  | The sharp cutting edge and raised projection near corner contribute to excellent chip control at very small depth of cut and low feed. |
| PSF |  | Developed chipbreaker for finishing at low cutting depths. Optimal chip control due to pre-positioned chipbreaker element. |
| PSS |  | 3-dimensional chipbreaker designed to have excellent chip control capability and low cutting force in finishing to medium cutting. Low cost, M-class positive insert used for high efficiency boring in a wide range of applications. |

| Chipbreaker | Appearance | Features |
|---|---|---|
| PS |  | 3-dimensional chipbreaker designed to have excellent chip control capability and low cutting force in finishing to medium cutting. Low cost, M-class positive insert used for high efficiency boring in a wide range of applications. |
| PM |  | Developed chipbreaker for medium cutting. Excellent chip control due to wide, positive chip flow zone. |

## STANDARD CUTTING CONDITIONS

| ISO | Operation | Work condition | Chip-breaker | Grade | Depth of cut *ap* (mm) | Feed *f* (mm/rev) | Cutting speed: *Vc* (m/min) Low carbon steels, Alloy steels | Medium carbon steels, Alloy steels | High carbon steels, Alloy steels |
|---|---|---|---|---|---|---|---|---|---|
| P | Precision finishing | Continuous | 01 | NS9530 | 0.05 - 0.5 | 0.03 - 0.15 | 150 - 250 | 80 - 220 | 80 - 180 |
| | | Light interrupted | 01 | NS9530 | 0.05 - 0.5 | 0.03 - 0.15 | 150 - 250 | 80 - 220 | 80 - 180 |
| | Finishing | Continuous | PSS | NS9530 | 0.1 - 0.5 | 0.05 - 0.3 | 150 - 250 | 80 - 220 | 80 - 180 |
| | | Light interrupted | PSS | NS9530 | 0.1 - 0.5 | 0.05 - 0.3 | 150 - 250 | 80 - 220 | 80 - 180 |
| | | Heavy interrupted | PSS | NS9530 | 0.1 - 0.5 | 0.05 - 0.3 | 150 - 250 | 80 - 220 | 80 - 180 |
| | Finishing to light cutting | Continuous | PS | NS9530 | 0.3 - 2.0 | 0.08 - 0.3 | 150 - 250 | 80 - 220 | 80 - 180 |
| | | Light interrupted | PS | NS9530 | 0.3 - 2.0 | 0.08 - 0.3 | 150 - 250 | 80 - 220 | 80 - 180 |
| | | Heavy interrupted | PS | NS9530 | 0.3 - 2.0 | 0.08 - 0.3 | 150 - 250 | 80 - 220 | 80 - 180 |
| | Finishing to Medium cutting | Continuous to Heavy interrupted | PS | T9115 | 0.5 - 2.5 | 0.08 - 0.3 | 150 - 300 | 100 - 200 | 80 - 180 |
| | | | PS | T9125 | 0.5 - 2.5 | 0.08 - 0.3 | 120 - 250 | 80 - 180 | 80 - 120 |
| | Medium cutting | Continuous to Heavy interrupted | PM | T9115 | 1.0 - 3.0 | 0.15 - 0.3 | 150 - 300 | 100 - 200 | 80 - 180 |
| | | | PM | T9125 | 1.0 - 3.0 | 0.15 - 0.3 | 120 - 250 | 80 - 180 | 80 - 120 |

Low carbon steels, Alloy steels: C10, 18CrMo4, E275A, 20Cr4, etc. Medium carbon steels, Alloy steels: C45, 42CrMo4, etc.
Hi carbon steels, Alloy steels: 41CrNiMo2, etc.

# TurnLine - Selection System

## SELECTION SYSTEM: POSITIVE INSERTS

## P Steel





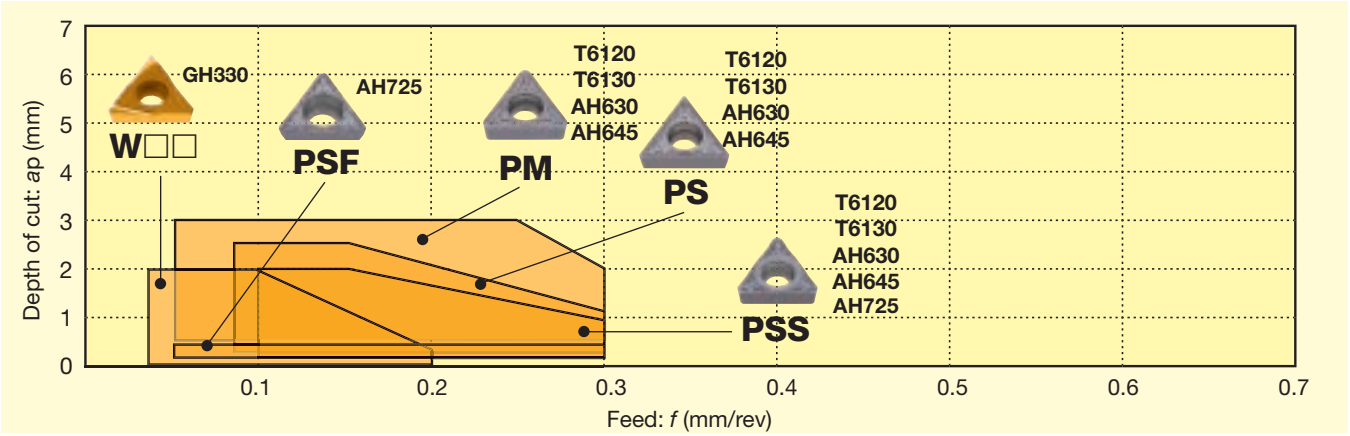
| | Continuous | Light interrupted | Heavy interrupted |
|---|---|---|---|
| **Precision finishing** [ $a_p$ = ~ 0.5 mm ] | Basic: **01 NS9530** | Basic: **01 NS9530** → Fracture: **PSF NS9530** | |
| **Finishing** [ $a_p$ = 0.1 ~ 0.5 mm ] | Basic: **PSS NS9530** → Wear: **PSS GT9530**; Fracture: **PS NS9530**; Chip control: **PSF NS9530** | Basic: **PSS NS9530** → Wear: **PSS GT9530**; Fracture: **PS NS9530**; Chip control: **PSF NS9530** | Basic: **PSS NS9530** → Wear: **PSS GT9530**; Fracture: **PS NS9530**; Chip control: **PSF NS9530** |
| **Finishing to Medium cutting** [ $a_p$ = 0.5 ~ 2.5 mm ] | Basic: **PS T9115** → Fracture: **PS T9125**; Wear: **PS NS9530** | Basic: **PS T9115** → Fracture: **PS T9125**; Wear: **PS NS9530** | Basic: **PS T9125** → Fracture: **PM T9125** |
| **Medium cutting** [ $a_p$ = 1.0 ~ 3.0 mm ] | Basic: **PM T9115** → Wear: **PM NS9530** | Basic: **PM T9115** → Fracture: **PM T9125** | Basic: **PM T9125** |

# TurnLine - Chipbreaker Guide

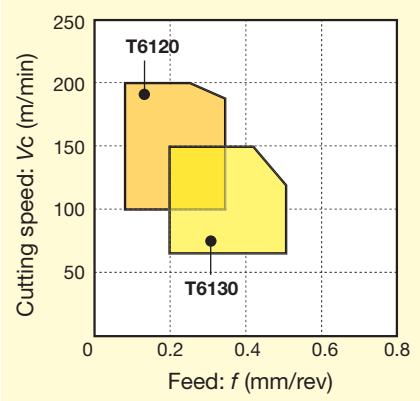
## BASIC CHIPBREAKERS: POSITIVE INSERTS

## M Stainless Steel

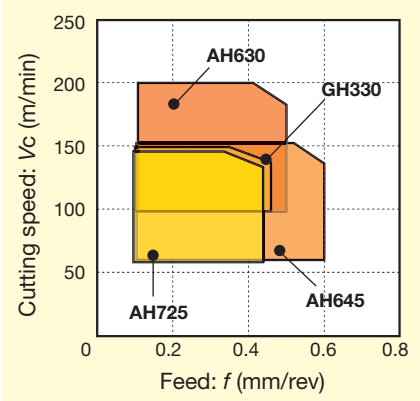
### Chipbreaker System for Turning (Positive Inserts)




### CVD coated grades




### PVD coated grades




| Chipbreaker | Appearance | Features |
|---|---|---|
| W□□ |  | Designed to control the direction of chip flow and used for precision finish boring. Provides excellent chip evacuation which is important to attain a highly accurate bore. |
| PSF |  | Developed chipbreaker for finishing at low cutting depths. Optimal chip control due to pre-positioned chipbreaker element. |

| Chipbreaker | Appearance | Features |
|---|---|---|
| PSS |  | 3-dimensional chipbreaker designed to have excellent chip control capability and low cutting force in finishing to medium cutting. Low cost, M-class positive insert used for high efficiency boring in a wide range of applications. |
| PS |  | 3-dimensional chipbreaker designed to have excellent chip control capability and low cutting force in finishing to medium cutting. Low cost, M-class positive insert used for high efficiency boring in a wide range of applications. |
| PM |  | Developed chipbreaker for medium cutting. Excellent chip control due to wide, positive chip flow zone. |

## STANDARD CUTTING CONDITIONS

| ISO | Operation | Work condition | Chipbreaker | Grade | Depth of cut *ap* (mm) | Feed *f* (mm/rev) | Cutting speed *Vc* (m/min) |
|---|---|---|---|---|---|---|---|
| M | Precision finishing | Continuous | W□□ | GH330 | 0.05 - 2.0 | 0.03 - 0.2 | 100 - 150 |
| | Finishing | Continuous | PSF | AH725 | 0.1 - 0.5 | 0.05 - 0.3 | 50 - 150 |
| | | Light interrupted | PSF | AH725 | 0.1 - 0.5 | 0.05 - 0.3 | 50 - 150 |
| | | Heavy interrupted | PSF | AH725 | 0.1 - 0.5 | 0.05 - 0.3 | 50 - 120 |
| | Finishing to light cutting | Continuous | PSS | AH630 | 0.3 - 2.0 | 0.08 - 0.3 | 90 - 190 |
| | | Light interrupted | PSS | AH630 | 0.3 - 2.0 | 0.08 - 0.3 | 90 - 190 |
| | | Heavy interrupted | PSS | AH630 | 0.3 - 2.0 | 0.08 - 0.3 | 90 - 190 |
| | Finishing to medium cutting | Continuous | PS | T6130 | 0.5 - 2.5 | 0.08 - 0.3 | 100 - 200 |
| | | Light interrupted | PS | AH630 | 0.5 - 2.5 | 0.08 - 0.3 | 90 - 190 |
| | | Heavy interrupted | PS | AH630 | 0.5 - 2.5 | 0.08 - 0.3 | 90 - 190 |
| | Medium cutting | Continuous | PM | T6130 | 1.0 - 3.0* | 0.15 - 0.3 | 100 - 200 |
| | | Light interrupted | PM | AH630 | 1.0 - 3.0* | 0.15 - 0.3 | 90 - 190 |
| | | Heavy interrupted | PM | AH630 | 1.0 - 3.0* | 0.15 - 0.3 | 90 - 190 |

* For CCMT0602 and DCMT0702 type inserts, *ap* = 0.5 - 2.5
Stainless steels: X5CrNi18-9, X5CrNiMo17-12-3, etc.

SELECTION SYSTEM: POSITIVE INSERTS

# M Stainless Steel





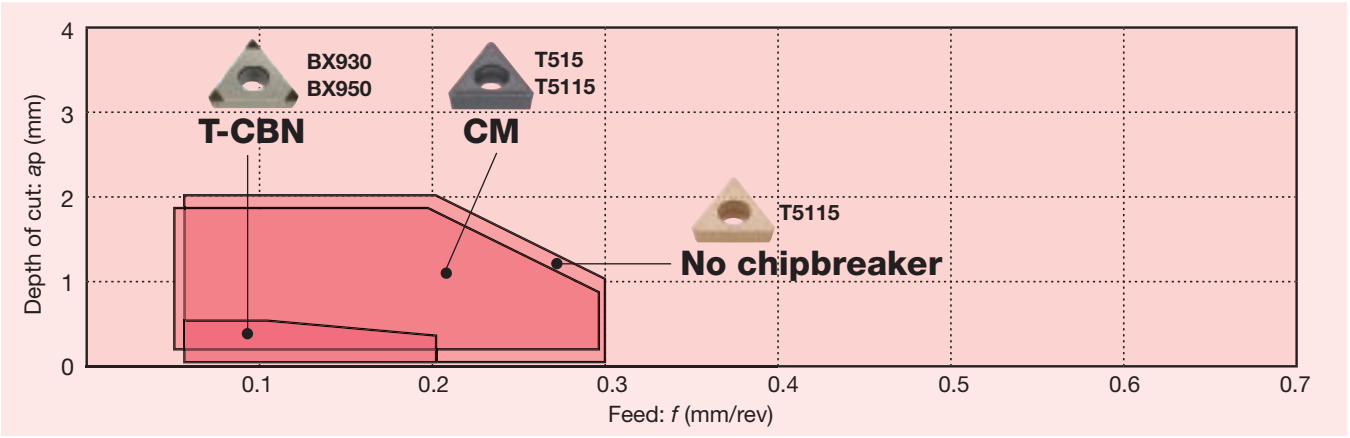


| | Continuous | Light interrupted | Heavy interrupted |
|---|---|---|---|
| Precision finishing [ $a_p$ = ~ 0.5 mm ] | Basic: W□□ GH330 | Basic: W□□ GH330 | |
| Finishing [ $a_p$ = 0.3 ~ 1.5 mm ] | Basic: PSF AH725 → Wear: PSS T6130 | Basic: PSF AH725 → Fracture: PSS AH630; Wear: PSS T6130 | Basic: PSF AH725 → Fracture: PSS AH630 |
| Finishing to Medium cutting [ $a_p$ = 0.5 ~ 2.5 mm ] | Basic: PSS AH630 → Wear: PS T6130 | Basic: PS AH630 → Fracture: PM AH645; Wear: PS T6130 | Basic: PS AH630 → Fracture: PM AH645; Wear: PS T6130 |
| Medium cutting [ $a_p$ = 1.0 ~ 3.0 mm ] | Basic: PM AH630 → Wear: PM T6130 | Basic: PM AH630 → Fracture: PM AH645; Wear: PM T6130 | Basic: PM AH630 → Fracture: PM AH645 |

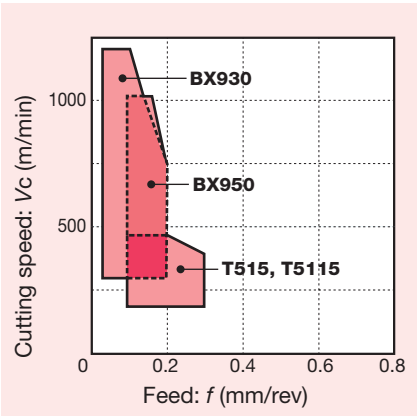
## BASIC CHIPBREAKERS: POSITIVE INSERTS

# K Cast Iron

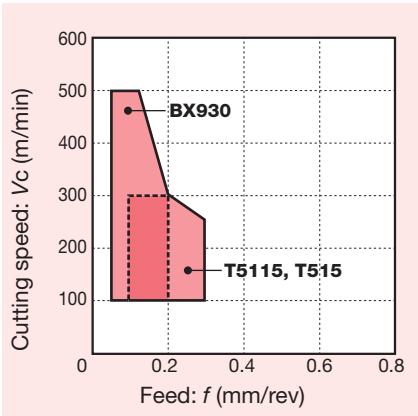
### Chipbreaker System for Turning (Positive Inserts)




### Grey cast irons




### Ductile cast irons




| Chipbreaker | Appearance | Features |
|---|---|---|
| No chip-breaker (T-CBN) |  | Performs well in high speed finishing of cast iron. |
| No chip-breaker |  | Can cover a wide range of applications from finishing to roughing of cast irons. Excels in cutting edge strength. |

| Chipbreaker | Appearance | Features |
|---|---|---|
| CM |  | All-around chipbreaker for general purpose cutting, provides low cutting forces and excellent performance in finishing to medium cutting. |

## STANDARD CUTTING CONDITIONS

| ISO | Operation | Work condition | Chip-breaker | Grade | Depth of cut *ap* (mm) | Feed *f* (mm/rev) | Cutting speed: *Vc* (m/min) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Grey cast irons | Ductile cast irons |
| K | Precision finishing | Continuous | Without | BX930 | 0.05 - 0.5 | 0.05 - 0.2 | 300 - 1200 | 100 - 500 |
| | | Light interrupted | Without | BX950 | 0.05 - 0.5 | 0.05 - 0.2 | 300 - 800 | 100 - 300 |
| | | | Without | BX470 | 0.05 - 0.5 | 0.05 - 0.2 | 300 - 800 | 100 - 300 |
| | Finishing | Continuous | CM | T515 | 0.05 - 2.0 | 0.05 - 0.3 | 150 - 700 | 150 - 300 |
| | | Heavy interrupted | CM | T515 | 0.05 - 2.0 | 0.05 - 0.3 | 100 - 200 | 100 - 200 |
| | Medium cutting | Light interrupted | CM | T515 | 0.05 - 2.0 | 0.05 - 0.3 | 100 - 300 | 100 - 250 |

Grey cast irons: 250, etc.
Ductile cast irons: 450-10S, etc.

SELECTION SYSTEM: POSITIVE INSERTS

## K Cast Iron



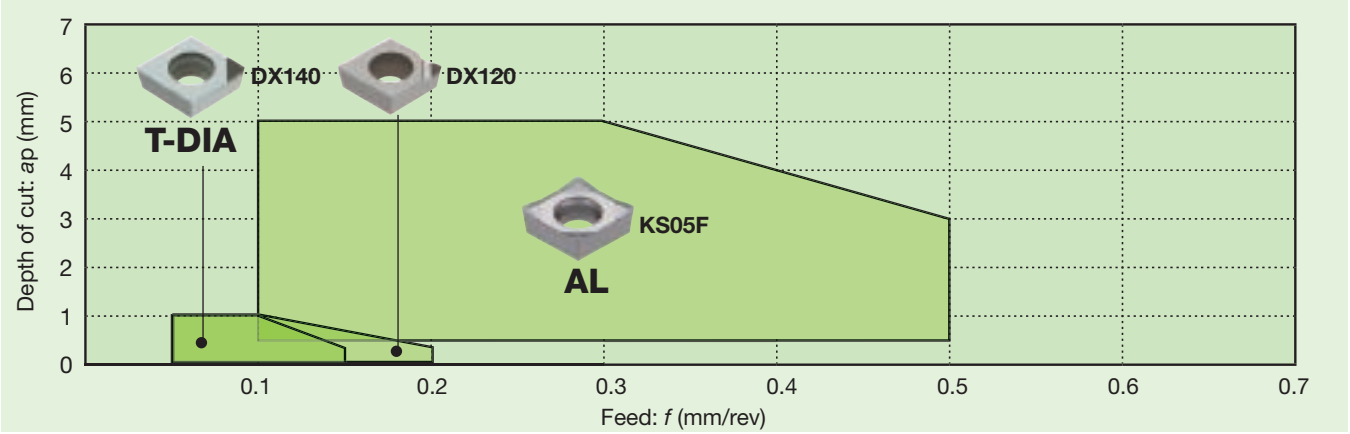


| | Continuous | Light interrupted | Heavy interrupted |
|---|---|---|---|
| Finishing to Medium cutting [ $a_p$ = 0.5 ~ 3.0 mm ] | Basic: CM T515 → Wear → T-CBN BX930 | Basic: CM T515 | Basic: CM T515 |

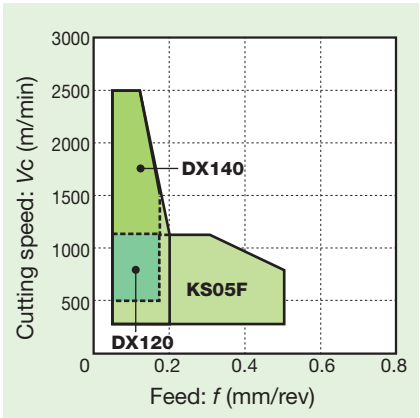
## BASIC CHIPBREAKERS: POSITIVE INSERTS

# N Non-ferrous Metal

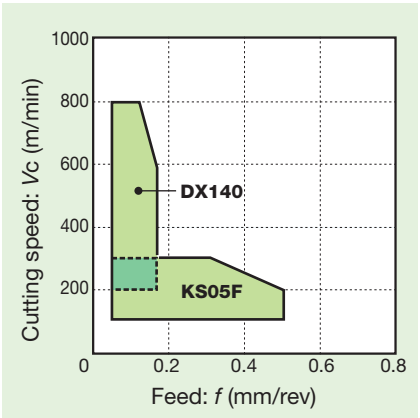
### Chipbreaker System for Turning (Positive Inserts)



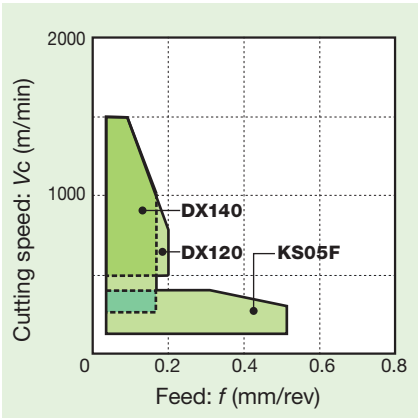

### Aluminium alloys (Si < 12%)

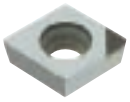
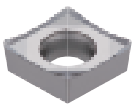



### Aluminium alloys (Si ≥ 12%)




### Copper alloys




| Chipbreaker | Appearance | Features |
|---|---|---|
| **No chip-breaker (T-DIA)** |  | Performs well in high speed finishing of non-ferrous materials. |
| **AL** |  | Extremely sharp cutting edge. Polished surface. Excellent chip forming at high cutting feeds. Low power consumption. |

| Chipbreaker | Appearance | Features |
|---|---|---|
| **With chip-breaker (T-DIA)** |  | The wide chipbreaker width contributes to excellent chip control. |

## STANDARD CUTTING CONDITIONS

| ISO | Operation | Work condition | Chip-breaker | Grade | Depth of cut *ap* (mm) | Feed *f* (mm/rev) | Cutting speed: *Vc* (m/min) Aluminium alloys (Si < 12%) | Aluminium alloys (Si > 12%) | Copper alloys |
|---|---|---|---|---|---|---|---|---|---|
| N | Precision finishing | Continuous | With | DX120 | 0.05 - 1.0 | 0.05 - 0.15 | 500 - 2500 | 400 - 800 | 500 - 1500 |
| | | Light interrupted | Without | DX140 | 0.05 - 1.0 | 0.05 - 0.2 | 300 - 2500 | - | 500 - 1500 |
| | Finishing | Continuous | Without | DX140 | 0.05 - 1.0 | 0.05 - 0.15 | 500 - 2500 | 400 - 800 | 500 - 1500 |
| | | Light interrupted | Without | DX140 | 0.05 - 1.0 | 0.05 - 0.15 | 300 - 1800 | 400 - 600 | 400 - 1200 |
| | | Heavy interrupted | AL | KS05F | 0.5 - 5.0 | 0.1 - 0.5 | 100 - 600 | 100 - 200 | - |
| | Medium cutting | Continuous | AL | KS05F | 0.5 - 5.0 | 0.1 - 0.5 | 100 - 1200 | 100 - 300 | 100 - 300 |
| | | Light interrupted | AL | KS05F | 0.5 - 5.0 | 0.1 - 0.5 | 100 - 900 | 100 - 200 | 100 - 200 |
| | | Heavy interrupted | AL | KS05F | 0.5 - 5.0 | 0.1 - 0.5 | 100 - 600 | 100 - 200 | - |

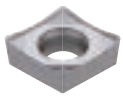
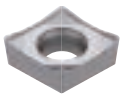
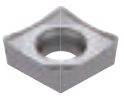
SELECTION SYSTEM: POSITIVE INSERTS

## N Non-ferrous Metal







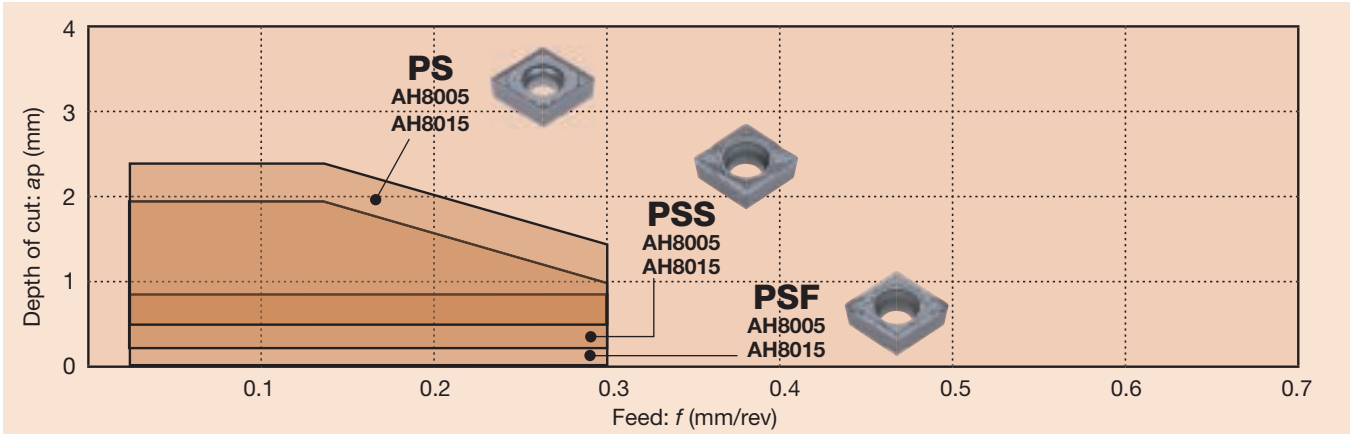
| | Continuous | Light interrupted | Heavy interrupted |
|---|---|---|---|
| Precision finishing [ $a_p$ = ~ 0.5 mm ] | Basic:  With chipbreaker DX120 → Wear → T-DIA DX140 | Basic:  With chipbreaker DX120 → Wear → T-DIA DX140 | |
| Finishing [ $a_p$ = 0.5 ~ 2.0 mm ] | Basic:  T-DIA DX140 → Wear → T-DIA DX160; Chip control → With chipbreaker T-DIA DX120 | Basic:  T-DIA DX140 → Fracture → AL KS05F; Wear → T-DIA DX160 | Basic:  AL KS05F |
| Medium cutting [ $a_p$ = 1.0 ~ 5.0 mm ] | Basic:  AL KS05F → Wear → With chipbreaker T-DIA DX120 | Basic:  AL KS05F → Wear → T-DIA DX140 | Basic:  AL KS05F |

## BASIC CHIPBREAKERS: POSITIVE INSERTS

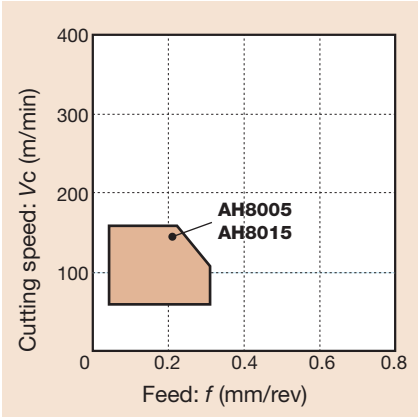
# S Superalloys and titanium



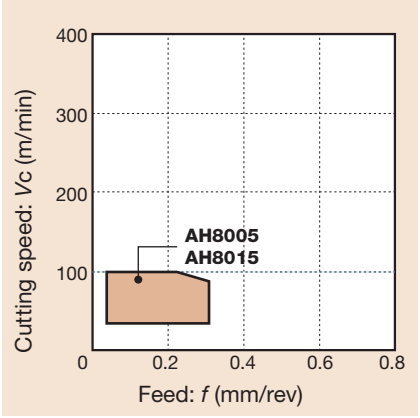
### Chipbreaker System for Turning (Positive Inserts)



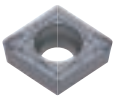

### Titanium alloys




### Ni-base alloys




| Chipbreaker | Appearance | Features |
|---|---|---|
| PS |  | 3-dimensional chipbreaker designed to have excellent chip control capability and low cutting force in finishing to medium cutting. Low cost, M-class positive insert used for high efficiency boring in a wide range of applications. |

| Chipbreaker | Appearance | Features |
|---|---|---|
| PSF |  | Developed chipbreaker for finishing at low cutting depths. Optimal chip control due to pre-positioned chipbreaker element. |
| PSS |  | 3-dimensional chipbreaker designed to have excellent chip control capability and low cutting force in finishing to medium cutting. Low cost, M-class positive insert used for high efficiency boring in a wide range of applications. |

## STANDARD CUTTING CONDITIONS

| ISO | Operation | Work condition | Chip-breaker | Grade | Depth of cut *ap* (mm) | Feed *f* (mm/rev) | Cutting speed: *Vc* (m/min) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Titanium alloys | Ni-base alloys |
| S | Finishing | Continuous | PSS | AH8015 | 0.3 - 2.0 | 0.02 - 0.3 | 20 - 150 | 20 - 100 |
| | | Light interrupted | PSS | AH8015 | 0.3 - 2.0 | 0.02 - 0.3 | 20 - 150 | 20 - 100 |
| | Finishing to medium cutting | Continuous | PS | AH8015 | 0.5 - 2.5 | 0.02 - 0.3 | 20 - 150 | 20 - 100 |
| | | Light interrupted | PS | AH8015 | 0.5 - 2.5 | 0.02 - 0.3 | 20 - 150 | 20 - 100 |

Ni-base alloys: INCONEL718 etc.
Titanium alloys: Ti - 6Al - 4V etc.

SELECTION SYSTEM: POSITIVE INSERTS

# S Superalloys and titanium







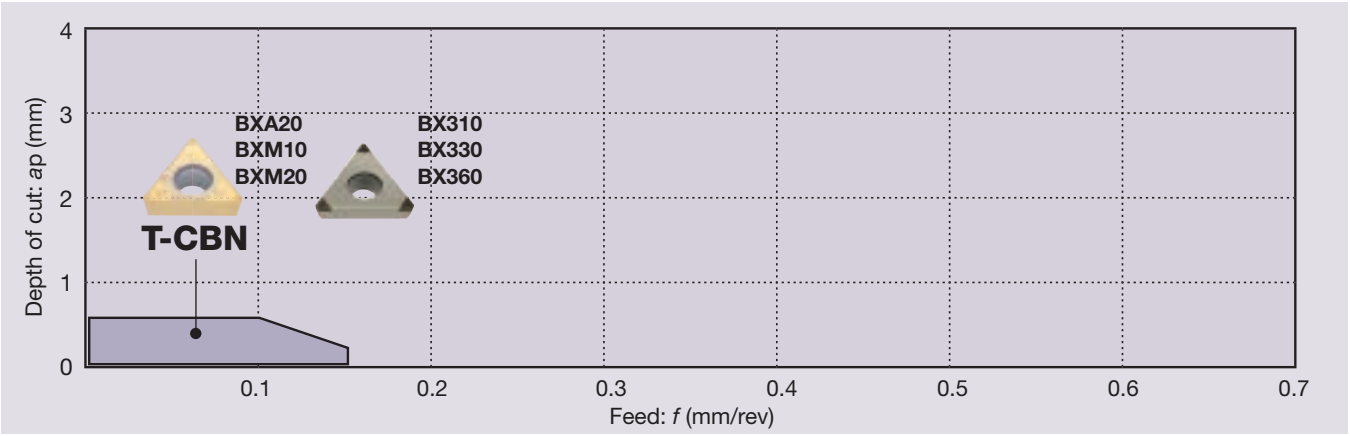
| | Continuous | Light interrupted | Heavy interrupted |
|---|---|---|---|
| Finishing [ $a_p$ = 0.3 ~ 2.0 mm ] | Basic: PSS AH8015 → Wear: PSS AH8005 | Basic: PSS AH8015 → Wear: PSS AH8005; Fracture: PS AH8015 | |
| Finishing to medium cutting [ $a_p$ = 0.5 ~ 2.5 mm ] | Basic: PS AH8015 → Wear: PSS AH8005 | Basic: PS AH8015 → Fracture: All-round AH8015 | Basic: PS AH8015 → Fracture: All-round AH8015 |

## BASIC CHIPBREAKERS: POSITIVE INSERTS

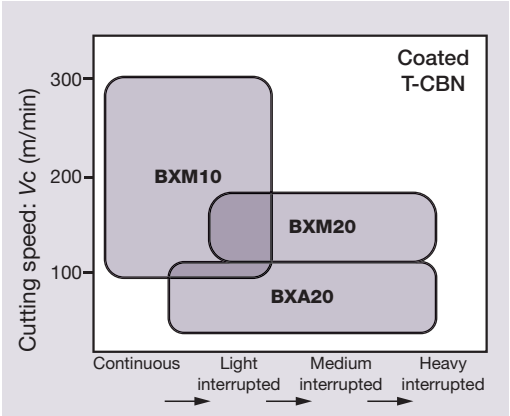
# H Hard Materials



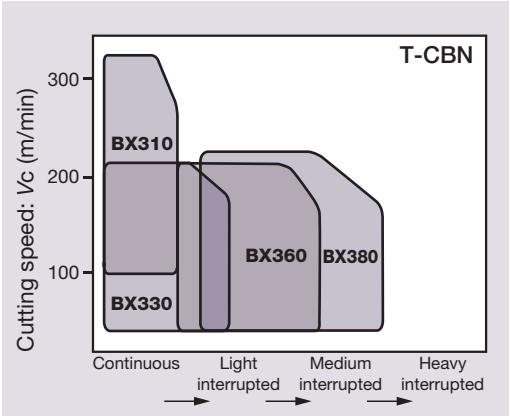
### Chipbreaker System for Turning (Positive Inserts)




**Coated T-CBN**




**T-CBN**




| Chipbreaker | Appearance | Features |
|---|---|---|
| No chip-breaker (T-CBN) |  | Performs well in finishing of hardened steel. |

## STANDARD CUTTING CONDITIONS

| ISO | Operation | Work condition | Chipbreaker | Grade | Depth of cut *ap* (mm) | Feed *f* (mm/rev) | Cutting speed *Vc* (m/min) |
|---|---|---|---|---|---|---|---|
| H | Precision finishing | Continuous | No chipbreaker (T-CBN) | BXM10 | 0.05 - 0.3 | 0.03 - 0.15 | 150 - 350 |
| | | Light interrupted | No chipbreaker (T-CBN) | BXM20 BXA20 | 0.05 - 0.3 | 0.03 - 0.15 | 70 - 220 |
| | Finishing | Continuous ~ interrupted | No chipbreaker (T-CBN) | BXM20 BXA20 | 0.07 - 0.5 | 0.05 - 0.3 | 70 - 220 |

Hardened steels, Pre-hardened steels: X153CrMoV12, X40CrMoV5-1, etc.

SELECTION SYSTEM: POSITIVE INSERTS

# H Hard Materials

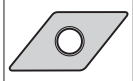
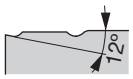
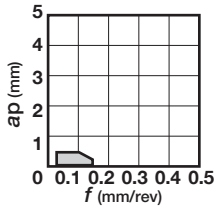
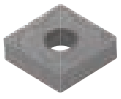
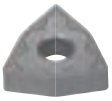
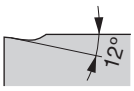
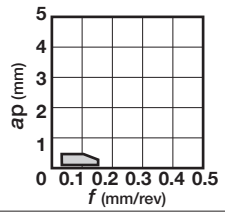
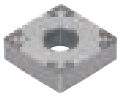
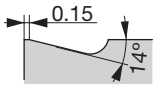
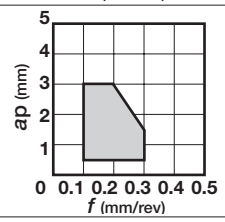
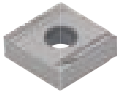
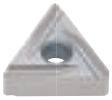
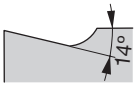
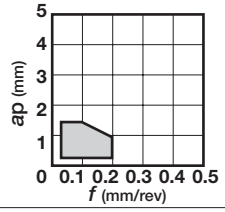
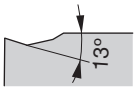
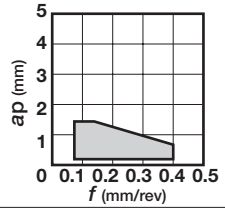
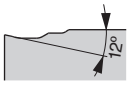
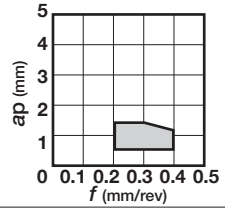
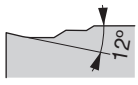
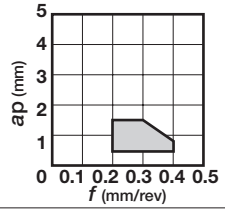
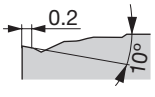
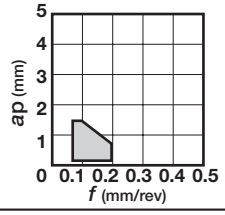


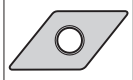
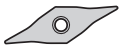
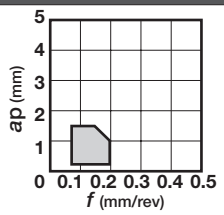
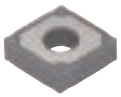
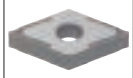
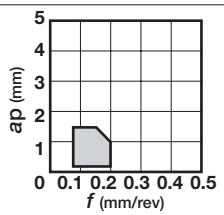
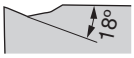
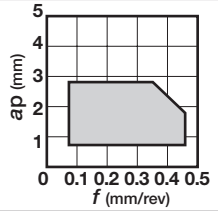
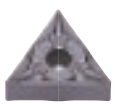
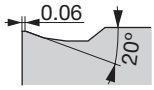
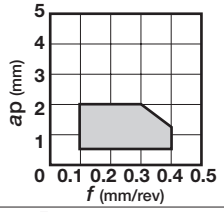
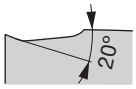
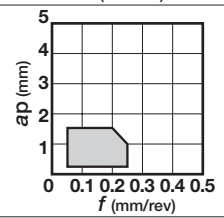
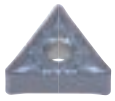
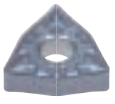
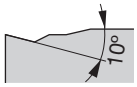
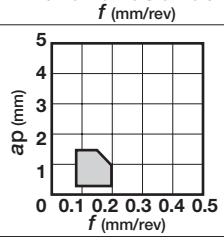
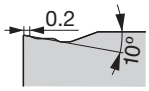
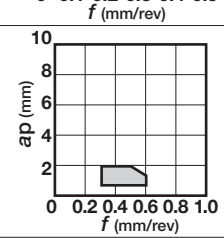
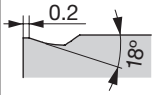
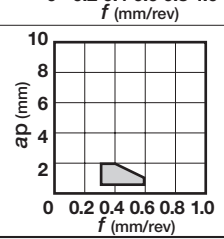




| | Continuous | Light interrupted | Heavy interrupted |
|---|---|---|---|
| Finishing [ $a_p$ = ~ 0.3 mm ] | Basic → T-CBN BXM10 | Basic → T-CBN BXM20<br>Fracture → T-CBN BXA20<br>For high speed Wear → T-CBN BXM10 | |
| Finishing [ $a_p$ = ~ 0.3 mm ] | Basic → T-CBN BXM10 | Basic → T-CBN BXM20<br>Fracture → T-CBN BXA20<br>For high speed Wear → T-CBN BXM10 | Basic → T-CBN BXM20<br>Fracture → T-CBN BXA20 |

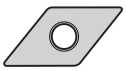
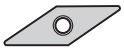
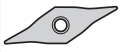
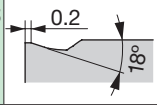
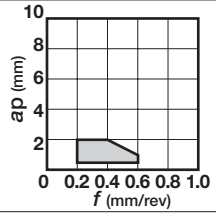
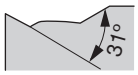
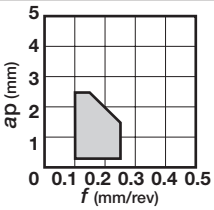
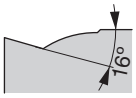
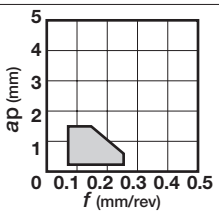
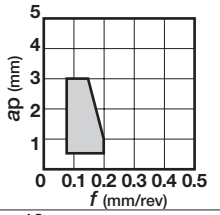
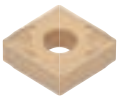
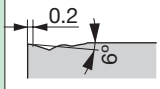
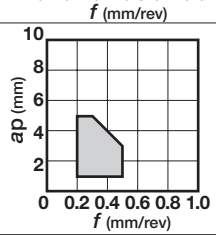
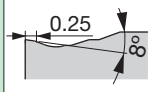
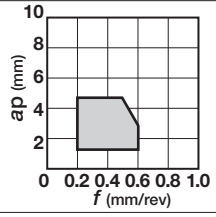
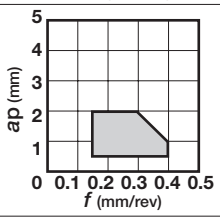
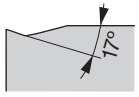
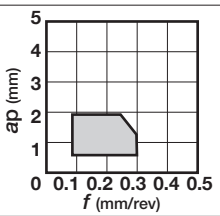
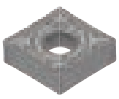
# TurnLine - Chipbreaker Overview

| Application | Negative type with hole | C | D | S | T | W | V | Y |
|---|---|---|---|---|---|---|---|---|
| | |  |  |  |  |  |  |  |
| | | 80° | 55° | 90° | 60° | 80° | 35° | 25° |
| Precision finishing | TF     |  B050 |  B061 |  B070 |  B079 |  B090 |  B097 | |
| | 01     |  B050 |  B061 |  B070 |  B079 |  B090 |  B097 | |
| | A~D     |  B050 | |  B070 |  B079 | | | |
| | W     | | | |  B080 | | | |
| Finishing | TSF     |  B050 |  B061 |  B070 |  B080 |  B090 |  B097 | |
| Finishing (Wiper) | FW     |  B050 |  B061 | |  B080 |  B090 | | |
| | AFW     |  B050 | | | |  B090 | | |
| Finishing | ZF     |  B051 |  B061 | |  B080 |  B090 |  B097 |  B101 |

| Application | Negative type with hole | | C | D | S | T | W | V | Y |
|---|---|---|---|---|---|---|---|---|---|
| | | |  |  |  |  |  |  |  |
| | | | 80° | 55° | 90° | 60° | 80° | 35° | 25° |
| Finishing | **11** |   |  B051 |  B062 |  B071 |  B081 |  B091 |  B097 | |
| Finishing of mild steels | **17** |   |  B051 |  B062 |  B071 |  B081 |  B091 | | |
| Finishing | **SF** |   |  B051 |  B062 |  B071 |  B081 |  B091 |  B097 | |
| | **CF** |   |  B051 |  B062 |  B071 |  B081 |  B091 |  B098 | |
| | **HRF** |   |  B051 |  B062 |  B071 |  B081 |  B091 |  B098 | |
| | **TS** |   |  B052 |  B063 |  B072 |  B082 |  B091 |  B098 | |
| Finishing to medium cutting (Wiper) | **SW** |   |  B052 |  B063 | |  B082 |  B092 | | |
| | **ASW** |   |  B052 | | | |  B092 | | |

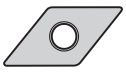
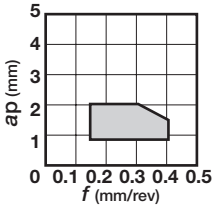
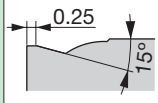
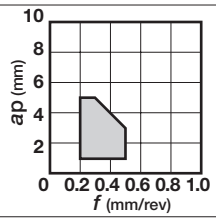
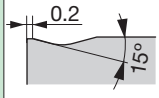
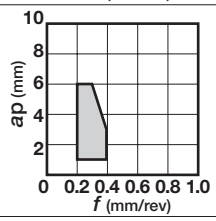
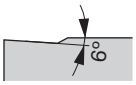
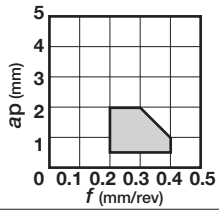
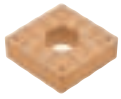
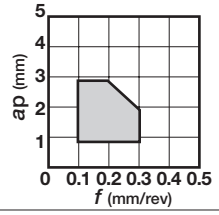
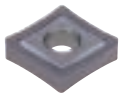
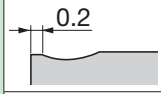
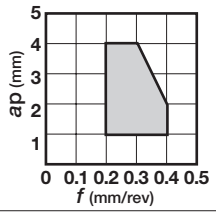
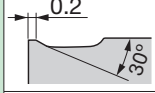
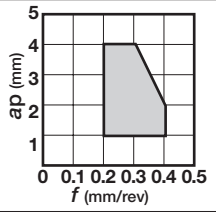
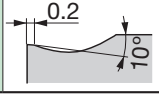
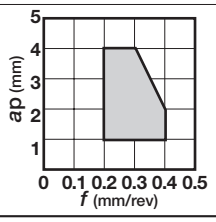
# TurnLine - Chipbreaker Overview



| Application | Negative type with hole | C | D | S | T | W | V | Y |
|---|---|---|---|---|---|---|---|---|
| | |  |  |  |  |  |  |  |
| | | 80° | 55° | 90° | 60° | 80° | 35° | 25° |
| High feed, small depth of cut | **AS**     |  B052 |  B063 |  B072 |  B082 |  B092 | | |
| Boring (Double sided) | **CB**     |  B052 |  B063 | |  B082 |  B092 | | |
| Finishing | **NS**     |  B053 |  B063 |  B072 |  B082 |  B092 | | |
| | **SS**    |  B053 |  B064 |  B072 |  B083 |  B092 |  B098 | |
| Medium cutting | **TM**     |  B053 |  B064 |  B072 |  B083 |  B093 |  B098 | |
| Finishing to medium cutting | **AM**     |  B053 |  B064 | |  B083 |  B093 | | |
| | **NM**     |  B053 |  B064 | |  B083 |  B093 | | |
| | **TQ**     |  B054 |  B065 | |  B083 |  B093 |  B099 | |

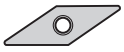
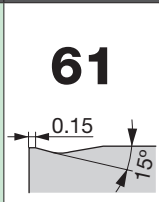
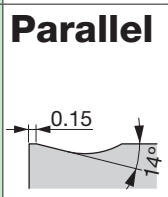
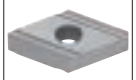
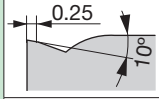
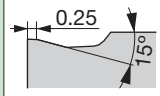
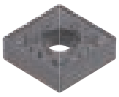
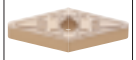
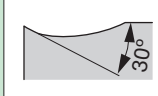
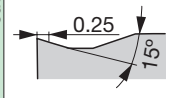
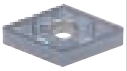
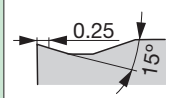
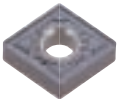
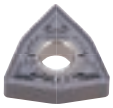
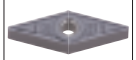
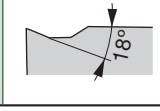
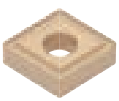
# TurnLine - Chipbreaker Overview



| Application | Negative type with hole | | C | D | S | T | W | V | Y |
|---|---|---|---|---|---|---|---|---|---|
| | | |  |  |  |  |  |  |  |
| | | | 80° | 55° | 90° | 60° | 80° | 35° | 25° |
| Finishing to medium cutting | **ZM** |     |  B054 |  B065 |  B073 |  B084 |  B093 |  B099 |  B101 |
| Medium cutting | **DM** |     |  B054 |  B065 |  B073 |  B084 |  B094 |  B099 | |
| | **All-round** |     |  B054 |  B065 |  B073 |  B084 |  B094 |  B099 | |
| Finishing to medium cutting | **27** |     |  B055 |  B065 |  B073 |  B084 |  B094 | | |
| Medium cutting | **28** |    |  B055 |  B066 | |  B085 | |  B099 | |
| | **33** |     |  B055 |  B066 | |  B085 |  B094 |  B099 | |
| | **37** |     |  B055 |  B066 |  B074 |  B085 |  B094 | | |
| | **38** |     |  B055 | | |  B085 | | | |

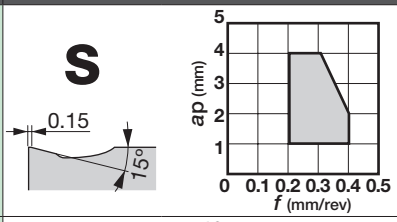
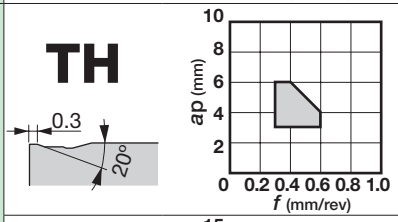
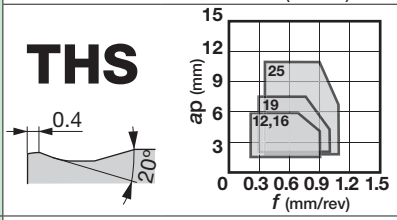
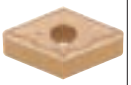
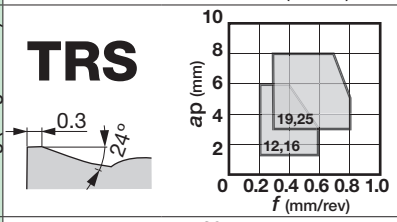
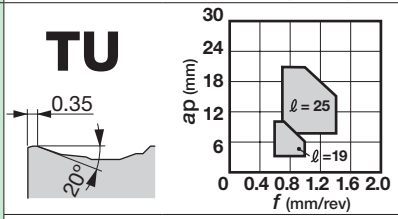
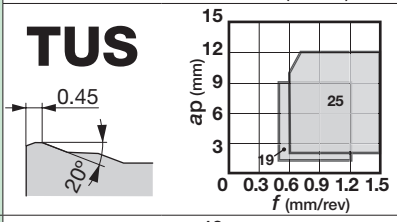
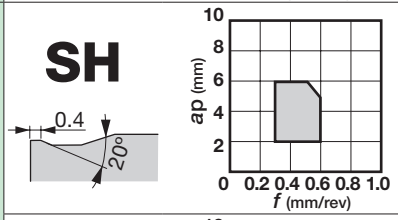
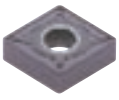
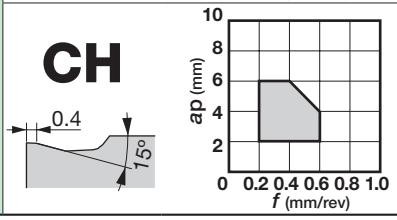
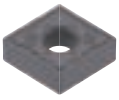
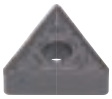
# TurnLine - Chipbreaker Overview



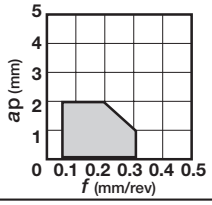
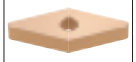
| Application | Negative type with hole | | C | D | S | T | W | V | R |
|---|---|---|---|---|---|---|---|---|---|
| | | |  |  |  |  |  |  |  |
| | | | 80° | 55° | 90° | 60° | 80° | 35° | |
| Heavy cutting (Single sided) | **61** |   | | | | | | |  B102 |
| Medium cutting | **Parallel** |   | |  B066 | | | | | |
| | **SM** |   |  B056 |  B066 |  B074 |  B085 |  B095 |  B100 | |
| | **CM** |   |  B056 |  B067 |  B074 |  B085 |  B095 |  B100 | |
| | **P** |   |  B056 |  B067 |  B074 |  B086 | | | |
| Finishing to medium cutting | **HRM** |   |  B056 |  B067 |  B074 |  B086 |  B095 |  B100 | |
| Medium cutting | **HMM** |   |  B056 |  B067 |  B075 |  B086 |  B095 |  B100 | |
| | **SA** |   |  B057 |  B067 |  B075 |  B086 |  B095 | | |

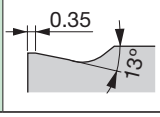
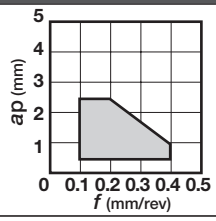
# TurnLine - Chipbreaker Overview



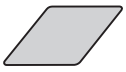
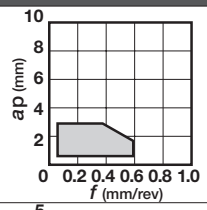
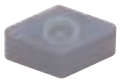
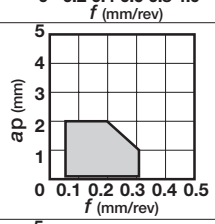
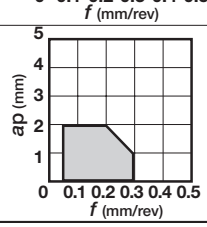
| Application | Negative type with hole | | C | D | S | T | W | V | R |
|---|---|---|---|---|---|---|---|---|---|
| | | | 80° | 55° | 90° | 60° | 80° | 35° | |
| Medium cutting | **S** |   |  B057 |  B067 |  B075 |  B087 | | | |
| Medium to heavy cutting | **TH** |   |  B057 |  B068 |  B075 |  B087 |  B096 | | |
| | **THS** |   |  B057 |  B068 |  B075 |  B087 |  B096 | | |
| Medium to heavy cutting (Single sided) | **TRS** |   |  B058 | |  B076 | | | | |
| Heavy cutting (Single sided) | **TU** |   |  B058 | |  B076 | | | | |
| | **TUS** |   |  B058 | |  B076 | | | | |
| Medium to heavy cutting | **SH** |   |  B058 |  B068 |  B076 | |  B096 | | |
| | **CH** |   |  B058 |  B068 |  B076 |  B087 |  B096 | | |

# TurnLine - Chipbreaker Overview

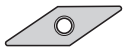
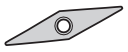
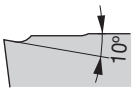
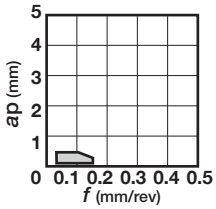
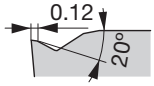
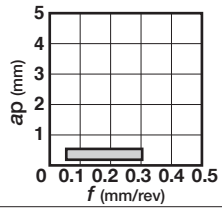
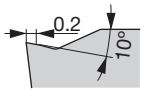
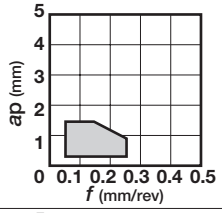
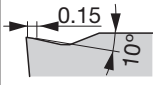
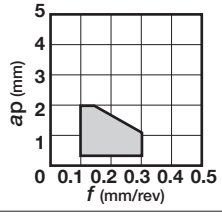
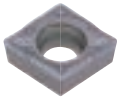
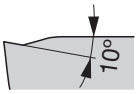
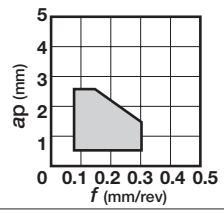
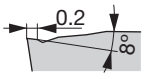
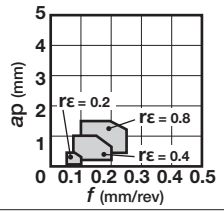
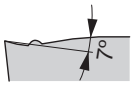
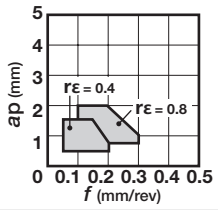
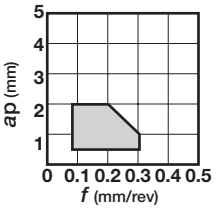
| Application | Negative type with hole | C | D | S | T | W | V | R |
|---|---|---|---|---|---|---|---|---|
| | |  |  |  |  |  |  |  |
| | | 80° | 55° | 90° | 60° | 80° | 35° | |
| Finishing to medium cutting | M,G-class    |  |  |  |  |  |  |  |
| | | B059 | B068 | B077 | B088 | B096 | B100 | B102 |

| Application | Negative type with hole | C | D | S | T | R | KNMX | LNGN |
|---|---|---|---|---|---|---|---|---|
| | |  |  |  |  |  |  |  |
| | | 80° | 55° | 90° | 60° | | 55° | 90° |
| Finishing | S1     | | | | | |  | |
| | | | | | | | B103 | |

# **Turn**Line - Chipbreaker Overview

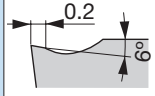
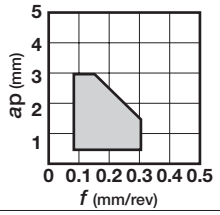
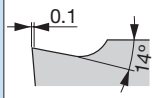
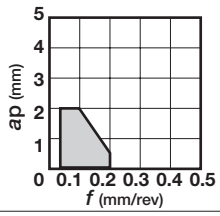
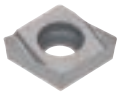
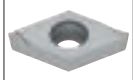
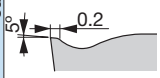
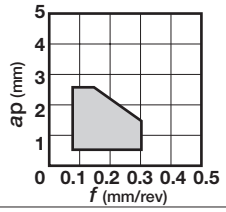
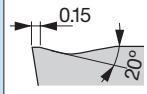
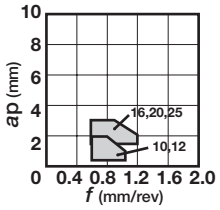
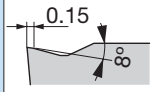
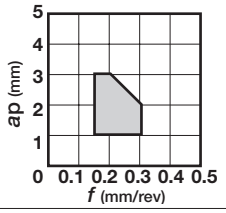
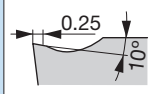
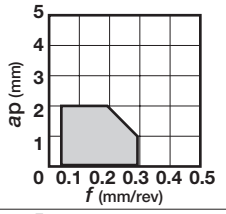
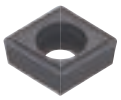
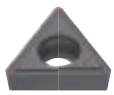
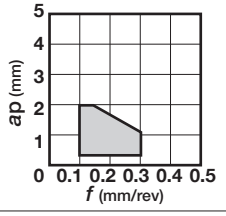
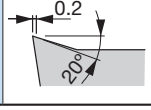
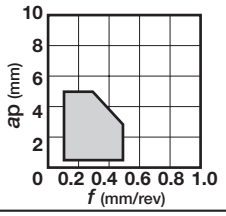
| Application | Negative type without hole | | C | D | S | T | V | R | H |
|---|---|---|---|---|---|---|---|---|---|
| | | |  |  |  |  |  |  |  |
| | | | 80° | 55° | 90° | 60° | 35° | | 120° |
| Finishing to medium cutting | — G-class |  |  B060 |  B069 |  B078 | |  B101 | |  B103 |
| | — M,G-class |  |  B060 |  B069 |  B078 |  B089 | |  B102 | |
| Finishing to roughing | — M,G-class |  |  B060 |  B069 |  B078 | | | | |

# TurnLine - Chipbreaker Overview

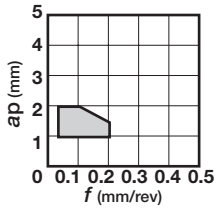
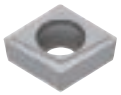
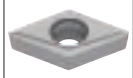
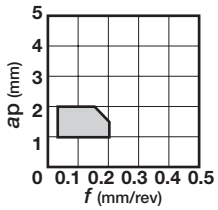
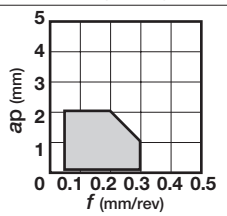
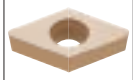
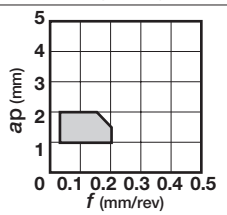
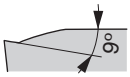
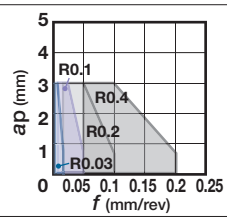
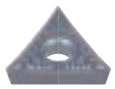
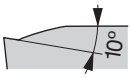
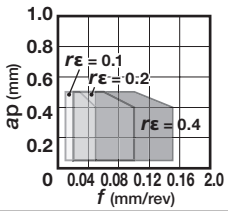
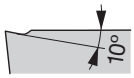
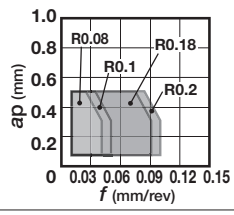
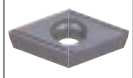
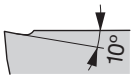
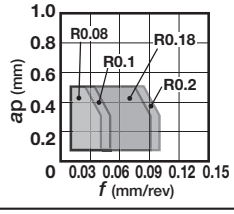
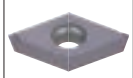
| Application | Positive 7° with hole | C | D | S | T | V | Y | R |
|---|---|---|---|---|---|---|---|---|
| | |  |  |  |  |  |  |  |
| | | 80° | 55° | 90° | 60° | 35° | 25° | |
| Precision finishing | 01     |  B104 |  B114 | |  B126 | | | |
| Finishing | PSF     |  B104 |  B114 | |  B126 |  B145 | | |
| | PF     |  B104 |  B114 | | |  B145 | | |
| Finishing to light cutting | PSS     |  B105 |  B115 | |  B126 |  B145 | | |
| Finishing to medium cutting | PS     |  B105 |  B115 |  B122 |  B127 |  B145 | | |
| | ZF     | | | | | |  B148 | |
| | ZM     | | | | | |  B148 | |
| | 23    |  B105 |  B115 |  B122 |  B127 | | | |

# TurnLine - Chipbreaker Overview

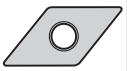
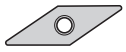
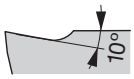
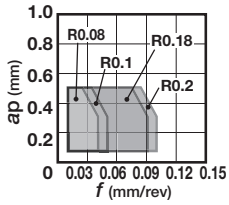
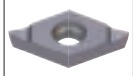
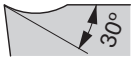
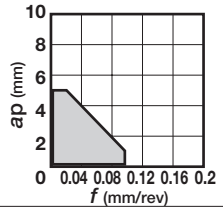
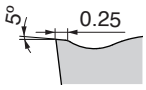
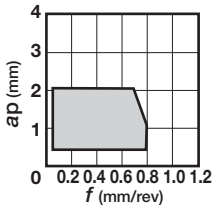
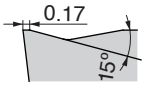
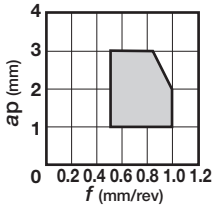


| Application | Positive 7° with hole | C | D | S | T | V | Y | R |
|---|---|---|---|---|---|---|---|---|
| | | 80° | 55° | 90° | 60° | 35° | 25° | |
| Medium cutting | **24**     |  B105 |  B115 |  B122 |  B127 |  B146 | | |
| Finishing | **W****     |  B106 |  B116 | |  B127 | | | |
| Finishing to medium cutting | **RS**     | | | | | | |  B152 |
| Heavy cutting | **61**     | | | | | | |  B153 |
| Medium cutting | **PM**     |  B107 |  B116 |  B122 |  B128 | | | |
| Finishing to medium cutting | **CM**     |  B107 |  B116 |  B122 |  B128 |  B146 | |  B152 |
| | **SS**    | | | |  B128 | | | |
| | **AL**     |  B108 |  B117 | |  B128 |  B146 | |  B152 |

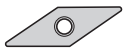
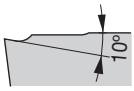
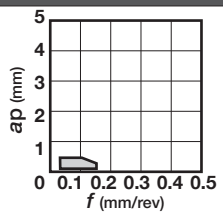
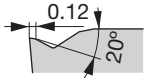
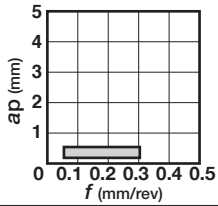
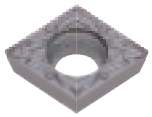
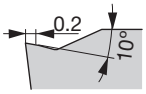
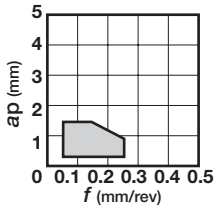
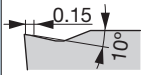
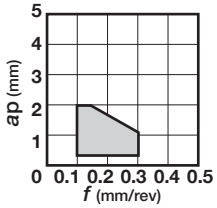
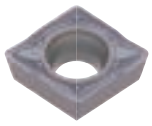
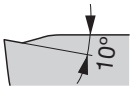
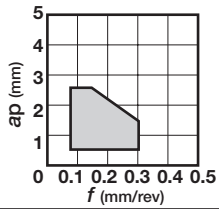
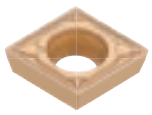
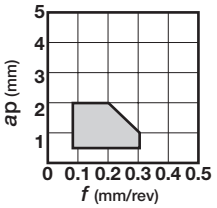
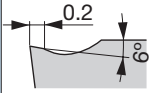
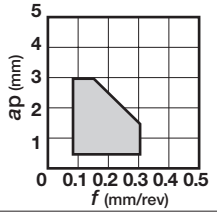
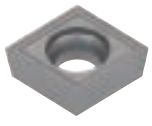
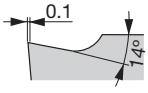
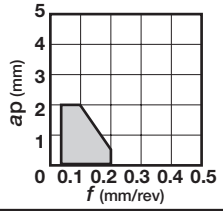
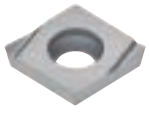
# TurnLine - Chipbreaker Overview

| Application | Positive 7° with hole | C | D | S | T | V | Y | R |
|---|---|---|---|---|---|---|---|---|
| | | 80° | 55° | 90° | 60° | 35° | 25° | |
| Finishing to medium cutting | **All-round**    |  B108 |  B117 | | |  B146 | | |
| | **Angular**     |  B108 |  B117 | | | | | |
| | — **M,G-class**    |  B108 |  B117 | | | | | |
| | — (with hand)     | | | |  B129 | | | |
| For external turning on small lathes (Sharp edge) | **JS**     |  B109 |  B118 | |  B129 | | | |
| For internal turning on small lathes | **JS**     |  B109 | | | | | | |
| For external turning on small lathes (Sharp edge) | **JPP**     | |  B118 | | | | | |
| | **JRP**     | |  B119 | | | | | |

# TurnLine - Chipbreaker Overview

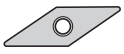
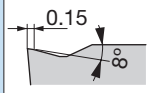
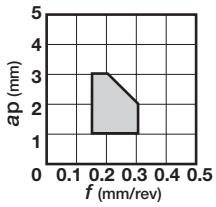
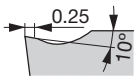
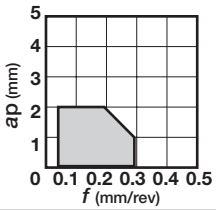
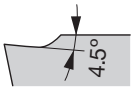
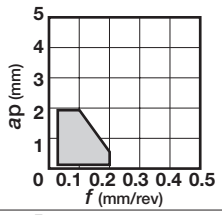
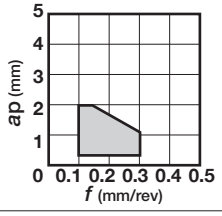
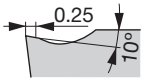
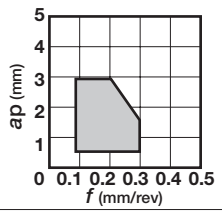
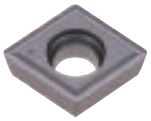
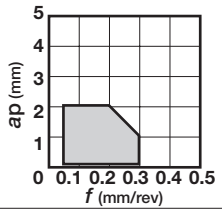
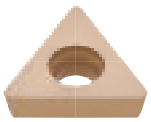
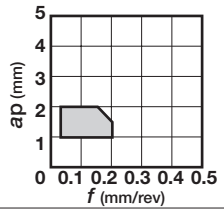
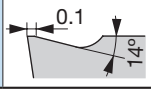
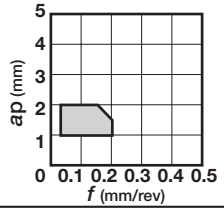
| Application | Positive 7° with hole | C | D | S | T | V | Y | R |
|---|---|---|---|---|---|---|---|---|
| | |  |  |  |  |  |  |  |
| | | 80° | 55° | 90° | 60° | 35° | 25° | |
| For external turning on small lathes (Sharp edge) | **JSP**     | |  B119 | | | | | |
| | **J□□**     |  B110 |  B119 | |  B129 | | | |
| Low cutting force | **6RS**     | | | | | | |  B253 |
| General use | **6RM**     | | | | | | |  B253 |

# TurnLine - Chipbreaker Overview

| Application | Positive 11° with hole | C | S | T | E | V |
|---|---|---|---|---|---|---|
| | |  |  |  |  |  |
| | | 80° | 90° | 60° | 75° | 35° |
| Precision finishing | **01**     | | |  B131 | | |
| Finishing | **PSF**     |  B111 | |  B131 | | |
| | **PF**     |  B111 | |  B131 | | |
| Finishing to light cutting | **PSS**     |  B111 | |  B132 | | |
| Finishing to medium cutting | **PS**     |  B111 |  B123 |  B132 | | |
| | **23**    | |  B123 |  B132 | | |
| Medium cutting | **24**     |  B112 |  B123 |  B133 | | |
| Finishing | **W****     |  B112 |  B123 |  B133 |  B120 | |

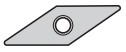
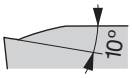
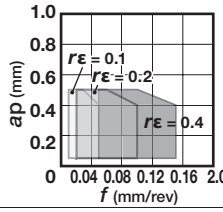
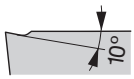
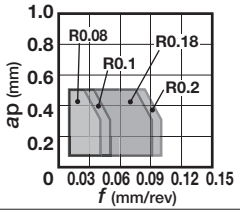
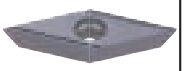
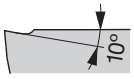
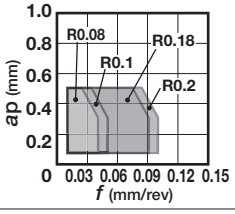
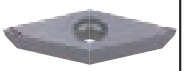
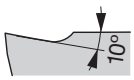
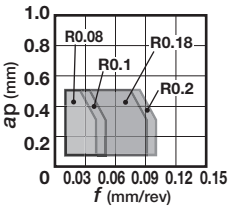
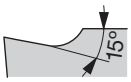
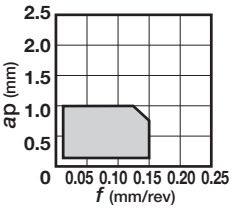
# TurnLine - Chipbreaker Overview

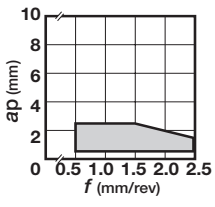


| Application | Positive 11° with hole | C | S | T | E | V |
|---|---|---|---|---|---|---|
| | |  |  |  |  |  |
| | | 80° | 90° | 60° | 75° | 35° |
| Medium cutting | **PM**     |  B113 | |  B135 | | |
| Finishing to medium cutting | **CM**     |  B113 |  B124 |  B135 | | |
| | **H****     | | |  B136 | | |
| | **SS**    | | |  B135 | | |
| Medium cutting | **All-round**     |  B113 | | | | |
| Finishing to medium cutting | — **M,G-class**    |  B113 |  B124 |  B136 | | |
| Finishing | — (with hand)     | |  Former Tungaloy-standard hole Not ISO B124 | | | |
| | — (with hand)     | | |  Former Tungaloy-standard hole Not ISO B136 | | |

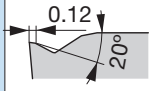
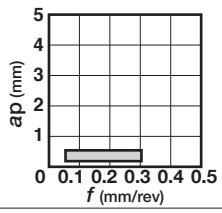
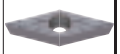
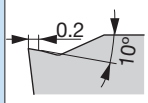
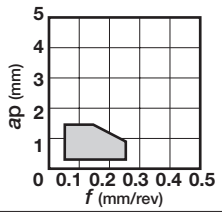
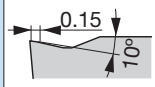
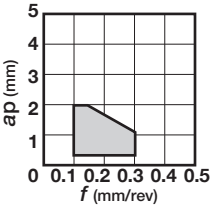
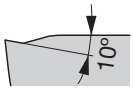
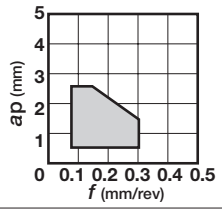
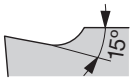
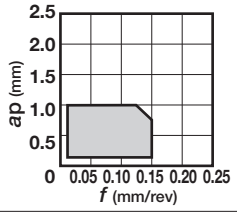
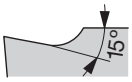
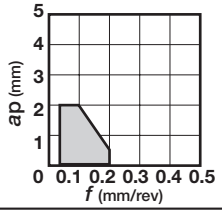
# TurnLine - Chipbreaker Overview

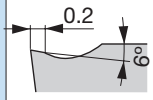
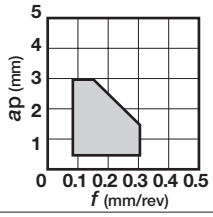
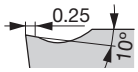
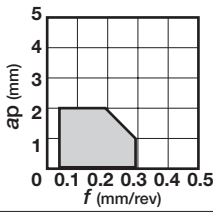
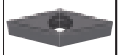
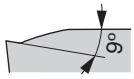
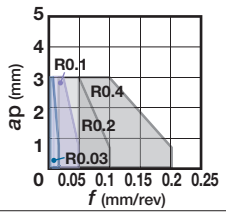
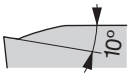
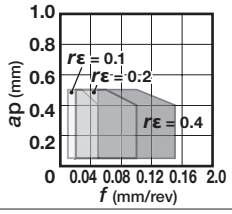
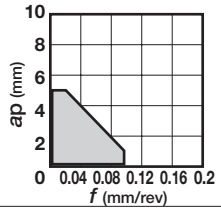
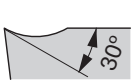
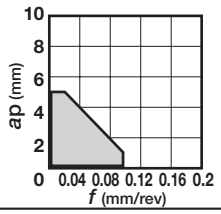


| Application | Positive 11° with hole | C | S | T | E | V |
|---|---|---|---|---|---|---|
| | |  |  |  |  |  |
| | | 80° | 90° | 60° | 75° | 35° |
| For intemal turning on small lathes | **JS**     | | |  B138 |  B121 | |
| For external turning on small lathes (Sharp edge) | **JPP**     | | | | |  B147 |
| | **JRP**     | | | | |  B147 |
| | **JSP**     | | | | |  B147 |
| Finishing | **J08**     | | | |  B121 | |

| Application | Positive 11° with hole | W |
|---|---|---|
| | |  |
| | | 80° |
| Heavy cutting | **ML**     |  B142 |

# TurnLine - Chipbreaker Overview

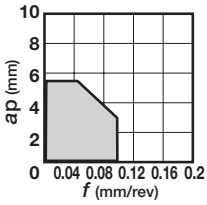
| Application | Positive 5° with hole | W 80° | V 35° |
|---|---|---|---|
| Finishing | **PSF**     | |  B142 |
| Finishing | **PF**     | |  B142 |
| Finishing to light cutting | **PSS**     | |  B143 |
| Finishing to medium cutting | **PS**     | |  B143 |
| Finishing | **W08**     |  B141 | |
| Finishing | **W11**     |  B141 | |

| Application | Positive 5° with hole | W 80° | V 35° |
|---|---|---|---|
| Medium cutting | **24**     | |  B143 |
| Finishing to medium cutting | **CM**     | |  B143 |
| For external turning on small lathes (Sharp edge) | **JS**     | |  B144 |
| For internal turning on small lathes | **JS**     |  B141 | |
| For external turning on small lathes (Sharp edge) | **J10**     | |  B144 |
| For external turning on small lathes (Honed edge) | **J10**     | |  B144 |

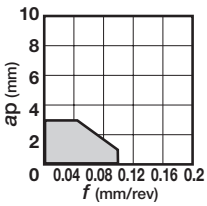
Insert

# TurnLine - Chipbreaker Overview

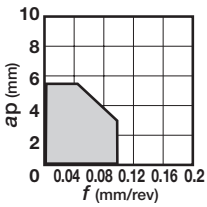
| Application | Positive with hole | JXF□ |
|---|---|---|
| Front-turning Insert | — |  B155 |



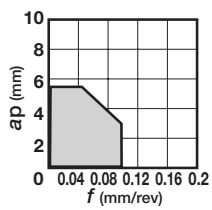

| Application | Positive with hole | J10E□ |
|---|---|---|
| Back-turning Insert | — |  B156 |



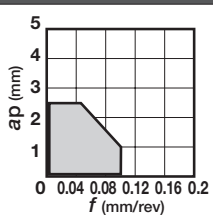

| Application | Positive with hole | JXB□ |
|---|---|---|
| Back-turning Insert | — |  B155 |



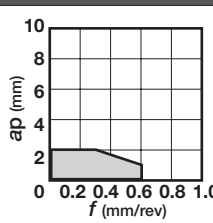

| Application | Positive with hole | JXR□ |
|---|---|---|
| Reverse-turning Insert | — |  B155 |



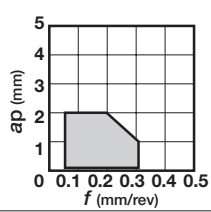

| Application | Positive with hole | JTB□ |
|---|---|---|
| Back-turning Insert | — |  B156 |



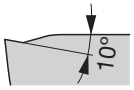
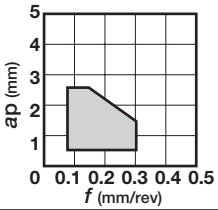
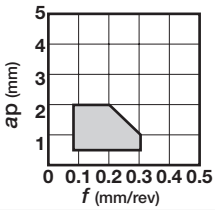
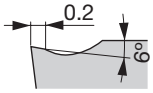
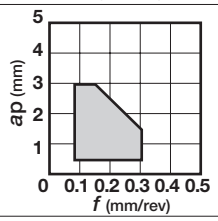
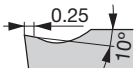
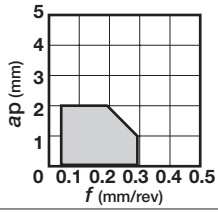
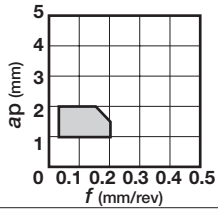
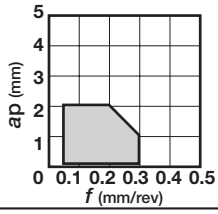
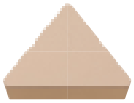

| Application | Positive without hole | RT□ |
|---|---|---|
| Medium cutting | — | Special round insert  B153 |




| Application | Positive without hole | RCGX□ |
|---|---|---|
| Medium cutting | — | Special round insert  B154 |

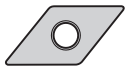
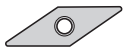
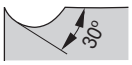
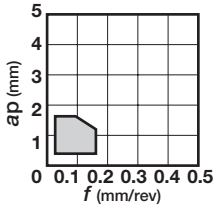
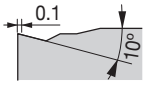
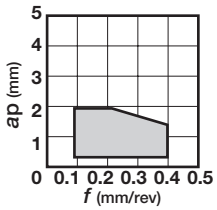
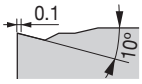
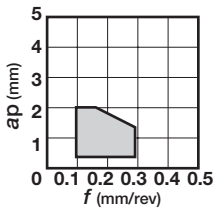
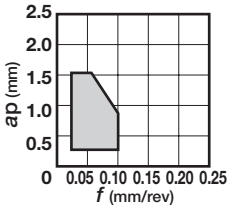
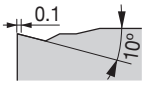
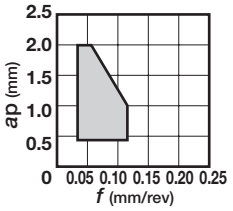
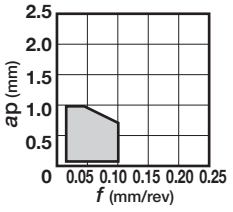


# TurnLine - Chipbreaker Overview

| Application | Positive 11° without hole | | S | T |
|---|---|---|---|---|
| | | |  |  |
| | | | 90° | 60° |
| Finishing to medium cutting | **PS**   |   | |  B139 |
| | **23**  |   |  B125 |  B139 |
| | **24**   |   | |  B139 |
| | **CM**   |   |  B125 |  B139 |
| | — (with hand)   |   |  B125 |  B140 |
| | — M,G-class  |   |  B125 |  B140 |

Insert

# TurnLine - Chipbreaker Overview

| Application | Chipbreaker Positive, double-sided | | D | W | V |
|---|---|---|---|---|---|
| | | |  |  |  |
| | | | 55° | 80° | 35° |
| Finishing (Low cutting force) | SS  |  |  B151 |  B149 | |
| Finishing (Wiper) | TSW  |  | |  B149 | |
| Finishing to medium cutting | TS  |  |  B151 |  B149 | |
| Finishing (Low cutting force) (sharp edge) | JSS  |  |  B150 |  B149 | |
| Finishing to medium cutting (sharp edge) | JTS  |  |  B150 |  B149 | |
| Finishing (sharp edge) | JRP  |  |  B150 | |  B151 |

MEMO

# TurnLine - Insert

● : Continuous cutting
ⓒ : Light interrupted cutting
✣ : Heavy interrupted cutting

## NEGATIVE TYPE



**Rhombic, 80° with hole**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ● | ●ⓒ | ●ⓒ | ✣ | ✣ | ●ⓒ | ● | | | ●ⓒ | | | | | ●ⓒ | ●ⓒ | | | ● | | | | | | | | | | | |
| M | Stainless | | | | | | ●ⓒ | ● | | | | | | | | | | | | ● | | | | | | | | | | | |
| K | Cast iron | ●ⓒ | ●ⓒ | ●ⓒ | | | ●ⓒ | ● | | | ●ⓒ | | | | | ●ⓒ | ●ⓒ | | | ● | | | | | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | | ● | | | | | | | | | | | |
| S | Superalloys | | | | | | ●ⓒ | ● | | | | | | | | | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | | Coated cermet | | Cermet | | Uncoated | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9105 | T9115 | T9125 | T9135 | AH120 | GH110 | GT9530 | | NS9530 | NS520 | TH10 | | | | | | | | | | | | | | | | | |
| Precision finishing | TF | CNMG120404-TF | 0.4 | | | | | | | | | ● | | ● | | | | | | | | | | | | | | | | | |
| | | CNMG120408-TF | 0.8 | | | | | | | | | ● | | | | | | | | | | | | | | | | | | | |
| | 01 | CNGG090302-01 | 0.2 | | | | | | | | | ● | | | | | | | | | | | | | | | | | | | |
| | | CNGG090304-01 | 0.4 | | | | | | | | | ● | | | | | | | | | | | | | | | | | | | |
| | | CNGG090308-01 | 0.8 | | | | | | | | | ● | | | | | | | | | | | | | | | | | | | |
| | | CNGG120402-01 | 0.2 | | | | | | | | | ● | ● | ● | | | | | | | | | | | | | | | | | |
| | | CNGG120404-01 | 0.4 | | | | | | | | | ● | ● | ● | | | | | | | | | | | | | | | | | |
| | | CNGG120408-01 | 0.8 | | | | | | | | | ● | ● | ● | | | | | | | | | | | | | | | | | |
| | C | CNGG120404R-C | 0.4 | | | | | | ● | | | ● | | | | | | | | | | | | | | | | | | | |
| | | CNGG120404L-C | 0.4 | | | | | | | | | ● | | | | | | | | | | | | | | | | | | | |
| | | CNGG120408R-C | 0.8 | | | | | | | | | ● | | | | | | | | | | | | | | | | | | | |
| | | CNGG120408L-C | 0.8 | | | | | | | | | ● | | | | | | | | | | | | | | | | | | | |
| Finishing | TSF | CNMG090404E-TSF | 0.4 | | ● | ● | | | | ● | | ● | | | | | | | | | | | | | | | | | | | |
| | | CNMG090408E-TSF | 0.8 | | ● | ● | | | | ● | | ● | | | | | | | | | | | | | | | | | | | |
| | | CNMG120404-TSF | 0.4 | ● | ● | ● | | ● | | ● | | ● | | | | | | | | | | | | | | | | | | | |
| | | CNMG120408-TSF | 0.8 | ● | ● | ● | ● | ● | | ● | | ● | | | | | | | | | | | | | | | | | | | |
| | | CNMG120412-TSF | 1.2 | | ● | ● | | ● | | | | | | | | | | | | | | | | | | | | | | | |
| Finishing (Wiper) | FW | CNMG090404E-FW | 0.4 | ● | ● | ● | | | | ● | | ● | | | | | | | | | | | | | | | | | | | |
| | | CNMG090408E-FW | 0.8 | ● | ● | ● | | | | ● | | ● | | | | | | | | | | | | | | | | | | | |
| | | CNMG120404-FW | 0.4 | | ● | | | | | ● | | ● | | | | | | | | | | | | | | | | | | | |
| | | CNMG120408-FW | 0.8 | ● | ● | ● | | | | ● | | ● | | | | | | | | | | | | | | | | | | | |
| | AFW | CNMG120404-AFW | 0.4 | | ● | ● | | | | ● | | ● | | | | | | | | | | | | | | | | | | | |
| | | CNMG120408-AFW | 0.8 | ● | ● | ● | ● | | | ● | | | | | | | | | | | | | | | | | | | | | |

● : Line-up

External toolholders → B200 -
J series toolholders → B342
PINZBOHR® → F136 - F151
Internal toolholders → B274 -
TungCap → B215, F046 -
Cartridges → F152 -

● : Continuous cutting
ɔ : Light interrupted cutting
✣ : Heavy interrupted cutting

## NEGATIVE TYPE



**Rhombic, 80° with hole**

| | | Coating | | | | | | | | | | Coated cermet | | | | Cermet | | | | Uncoated | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | T9115 | T9125 | T9135 | T6120 | T6130 | AH630 | T5105 | T5115 | AH8005 | AH8015 | GT9530 | GT720 | | | NS9530 | | | | TH10 | | | |
| P | Steel | ●ɔ | ɔ✣ | ✣ | ɔ | ✣ | ɔ✣ | | | | | ●ɔ | ●ɔ | | | ●ɔ | | | | ● | | | |
| M | Stainless | | | | ● | ɔ | ɔ | | | ● | ɔ | | | | | | | | | ● | | | |
| K | Cast iron | ●ɔ | | | | | | ● | ɔ | | | ●ɔ | ●ɔ | | | ●ɔ | | | | ● | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | | ● | | | |
| S | Superalloys | | | | | | | | | ● | ɔ | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9115 | T9125 | T9135 | T6120 | T6130 | AH630 | T5105 | T5115 | AH8005 | AH8015 | GT9530 | GT720 | NS9530 | TH10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Finishing | **ZF** | **CNMG090404E-ZF** | 0.4 | ● | ● | | | | | | | | | | | | |
| | | **CNMG120404-ZF** | 0.4 | ● | ● | | | | | | | | | ● | | ● | |
| | | **CNMG120408-ZF** | 0.8 | ● | ● | ● | | | | | | | | ● | | ● | |
| | **11** | **CNMG120404-11** | 0.4 | | | | | | | | | | | ● | | ● | ● |
| | | **CNMG120408-11** | 0.8 | | | | | | | | | | | ● | ● | ● | ● |
| Finishing of mild steels | **17** | **CNMG120404-17** | 0.4 | | | | | | | | | | | | | ● | |
| | | **CNMG120408-17** | 0.8 | | | | | | | | | | | | | ● | |
| Finishing | **SF** | **CNMG090304-SF** | 0.4 | | | | ● | ● | ● | | | | | | | | |
| | | **CNMG090308-SF** | 0.8 | | | | ● | ● | ● | | | | | | | | |
| | | **CNMG120404-SF** | 0.4 | | | | ● | ● | ● | | | | | | | | |
| | | **CNMG120408-SF** | 0.8 | | | | ● | ● | ● | | | | | | | | |
| | | **CNMG120412-SF** | 1.2 | | | | ● | ● | ● | | | | | | | | |
| | **CF** | **CNMG120404-CF** | 0.4 | | | | | | | ● | ● | | | | | | |
| | | **CNMG120408-CF** | 0.8 | | | | | | | ● | ● | | | | | | |
| | | **CNMG120412-CF** | 1.2 | | | | | | | ● | ● | | | | | | |
| | **HRF** | **CNMG120404-HRF** | 0.4 | | | | | | | | | ● | ● | | | | |
| | | **CNMG120408-HRF** | 0.8 | | | | | | | | | ● | ● | | | | |
| | | **CNMG120412-HRF** | 1.2 | | | | | | | | | ● | ● | | | | |

● : Line-up

| | | | |
|---|---|---|---|
| External toolholders | → **B200 -** | Internal toolholders | → **B274 -** |
| J series toolholders | → **B342** | TungCap | → **B215, F046 -** |
| PINZBOHR® | → **F136 - F151** | Cartridges | → **F152 -** |

# TurnLine - Insert

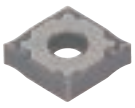
● : Continuous cutting
ɔ : Light interrupted cutting
✣ : Heavy interrupted cutting

## NEGATIVE TYPE



**Rhombic, 80° with hole**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ● | ●ɔ | ɔ✣ | ✣ | ✣ | | | | | | ●ɔ | | | | ●ɔ | ●ɔ | | | | | | | | | | | | | | | | |
| M | Stainless | | | | | ɔ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| K | Cast iron | ●ɔ | ●ɔ | | | | | ●ɔ | ɔ | | | ●ɔ | | | | ●ɔ | ●ɔ | | | | | | | | | | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S | Superalloys | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | | | | Coated cermet | | | | Cermet | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9105 | T9115 | T9125 | T9135 | T6130 | T515 | T5115 | | GT9530 | | | | NS9530 | NS520 | | | | | | | | | | | | | | | | |
| Finishing | TS | CNMG120404-TS | 0.4 | | ● | ● | ● | | | | | ● | | | | ● | ● | | | | | | | | | | | | | | | | |
| |  | CNMG120408-TS | 0.8 | ● | ● | ● | ● | ● | | | | ● | | | | ● | ● | | | | | | | | | | | | | | | | |
| | | CNMG120412-TS | 1.2 | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Finishing to medium cutting (Wiper) | SW | CNMG090408E-SW | 0.8 | ● | ● | ● | | | | ● | | | | | | | | | | | | | | | | | | | | | | | |
| |  | CNMG090412E-SW | 1.2 | ● | ● | ● | | | | ● | | | | | | | | | | | | | | | | | | | | | | | |
| | | CNMG120408-SW | 0.8 | ● | ● | ● | | | ● | ● | | | | | | | | | | | | | | | | | | | | | | | |
| | | CNMG120412-SW | 1.2 | ● | ● | ● | | | ● | ● | | | | | | | | | | | | | | | | | | | | | | | |
| | ASW | CNMG120408-ASW | 0.8 | ● | ● | ● | | | | | | | | | | ● | | | | | | | | | | | | | | | | | |
| |  | CNMG120412-ASW | 1.2 | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| High feed, small depth of cutting | AS | CNMG120404-AS | 0.4 | ● | ● | ● | | | | | | | | | | ● | | | | | | | | | | | | | | | | | |
| |  | CNMG120408-AS | 0.8 | ● | ● | ● | ● | | | | | | | | | ● | | | | | | | | | | | | | | | | | |
| | | CNMG120412-AS | 1.2 | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Boring (Double sided) | CB | CNMG090304-CB | 0.4 | | | | | | | | | | | | | ● | | | | | | | | | | | | | | | | | |
| |  | CNMG090308-CB | 0.8 | | | | | | | | | | | | | ● | | | | | | | | | | | | | | | | | |

● : Line-up

| | | | |
|---|---|---|---|
| External toolholders | → B200 - | Internal toolholders | → B274 - |
| J series toolholders | → B342 | TungCap | → B215, F046 - |
| PINZBOHR® | → F136 - F151 | Cartridges | → F152 - |

● : Continuous cutting
ɔ : Light interrupted cutting
✣ : Heavy interrupted cutting

## NEGATIVE TYPE



**Rhombic, 80° with hole**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ● | ●ɔ | ɔ✣ | ✣ | ɔ | ✣ | ɔ✣ | ✣ | | ● | ●ɔ | ɔ | | ●ɔ | | | | ●ɔ | | | | | | | | | | |
| M | Stainless | | | | | ● | ɔ | ɔ | ✣ | | ● | ●ɔ | ɔ | ɔ | ●ɔ | | | | | | | | | | | | | | |
| K | Cast iron | ●ɔ | ●ɔ | | | | | | | ●ɔ | ● | ●ɔ | ɔ | | ●ɔ | | | | ●ɔ | | | | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S | Superalloys | | | | | | | | | | ● | ●ɔ | ● | ɔ | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | | | | | | | | | | Cermet | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9105 | T9115 | T9125 | T9135 | T6120 | T6130 | AH630 | AH645 | T515 | AH110 | AH120 | AH725 | AH8015 | GH330 | NS9530 | | | | | | | | | | | |
| Finishing | NS | CNMG120404-NS | 0.4 | | | | | | | | | | | | | | | ● | | | | | | | | | | | |
| | | CNMG120408-NS | 0.8 | | ● | ● | | | | | | | | | | | | ● | | | | | | | | | | | |
| | SS | CNMG090404E-SS | 0.4 | | | | | | | ● | ● | | | | | | | | | | | | | | | | | | |
| | | CNMG090408E-SS | 0.8 | | | | | | | ● | ● | | | | | | | | | | | | | | | | | | |
| | | CNMG120404-SS | 0.4 | | | | | ● | ● | ● | ● | | | | | | ● | | | | | | | | | | | | |
| | | CNMG120408-SS | 0.8 | | | | | ● | ● | ● | ● | | | ● | | | ● | | | | | | | | | | | | |
| | | CNMG120412-SS | 1.2 | | | | | ● | ● | ● | ● | | | | | | ● | | | | | | | | | | | | |
| Medium cutting | TM | CNMG090304-TM | 0.4 | | ● | ● | | | | | | | | | | | | | | | | | | | | | | | |
| | | CNMG090308-TM | 0.8 | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | CNMG090404E-TM | 0.4 | | ● | ● | | ● | ● | ● | | ● | | ● | | ● | | | | | | | | | | | | | |
| | | CNMG090408E-TM | 0.8 | | ● | ● | | ● | ● | ● | | ● | | ● | | ● | | | | | | | | | | | | | |
| | | CNMG090412E-TM | 1.2 | | ● | ● | | ● | ● | ● | | ● | | ● | | ● | | | | | | | | | | | | | |
| | | CNMG120404-TM | 0.4 | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | | ● | | | | | | | | | | | | | |
| | | CNMG120408-TM | 0.8 | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | ● | ● | | | | | | | | | | | | | |
| | | CNMG120412-TM | 1.2 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | | | | | | | | | | | | | |
| | | CNMG120416-TM | 1.6 | | ● | ● | ● | ● | ● | ● | ● | ● | | ● | | ● | | | | | | | | | | | | | |
| | | CNMG160612-TM | 1.2 | ● | ● | ● | ● | | | | | | | ● | | | | | | | | | | | | | | | |
| | | CNMG190608-TM | 0.8 | ● | ● | ● | ● | | | | | | | ● | | | | | | | | | | | | | | | |
| | | CNMG190612-TM | 1.2 | ● | ● | ● | ● | | | | | | | ● | | | | | | | | | | | | | | | |
| Finishing to medium cutting | AM | CNMG120408-AM | 0.8 | | ● | ● | | | | | | | | | | | | | | | | | | | | | | | |
| | | CNMG120412-AM | 1.2 | | ● | ● | | | | | | | | | | | | | | | | | | | | | | | |
| | | CNMG120416-AM | 1.6 | | ● | ● | | | | | | | | | | | | | | | | | | | | | | | |
| | NM | CNMG120408-NM | 0.8 | ● | ● | ● | ● | | | | | | | | | | | ● | | | | | | | | | | | |
| | | CNMG120412-NM | 1.2 | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | |

● : Line-up

| | | | |
|---|---|---|---|
| External toolholders | → B200 - | Internal toolholders | → B274 - |
| J series toolholders | → B342 | TungCap | → B215, F046 - |
| PINZBOHR® | → F136 - F151 | Cartridges | → F152 - |

# TurnLine - Insert

● : Continuous cutting
ɔ : Light interrupted cutting
✣ : Heavy interrupted cutting

## NEGATIVE TYPE



**Rhombic, 80° with hole**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ● | ●ɔ | ɔ✣ | ✣ | | | | | ● | ●ɔ | | | | ●ɔ | ●ɔ | | | ●ɔ | ●ɔ | | | ● | | | | | | |
| M | Stainless | | | | | | | | | ● | ●ɔ | | | | | | | | | | | | ● | | | | | | |
| K | Cast iron | ●ɔ | ●ɔ | | | ●ɔ | ● | ɔ | ✣ | ● | ●ɔ | | | | ●ɔ | ●ɔ | | | ●ɔ | ●ɔ | | | ● | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | | | | | ● | | | | | | |
| S | Superalloys | | | | | | | | | ● | ●ɔ | | | | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | | | | | | Coated cermet | | | | Cermet | | | | Uncoated | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9105 | T9115 | T9125 | T9135 | T515 | T5105 | T5115 | T5125 | AH110 | AH120 | | | | | GT9530 | GT720 | | | NS9530 | NS520 | | | TH10 | | | |
| Finishing to medium cutting | **TQ** | **CNMG120404-TQ** | 0.4 | | | | | | | | | | | | | | | ● | | | | ● | | | | | | | |
| | | **CNMG120408-TQ** | 0.8 | | | | | | | | | | | | | | | ● | | | | ● | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | **ZM** | **CNMG090408E-ZM** | 0.8 | | ● | ● | | | | | | | | | | | | | | | | | | | | | | | |
| | | **CNMG120408-ZM** | 0.8 | | ● | ● | ● | | | | | | | | | | | ● | | | | ● | | | | | | | |
| | | **CNMG120412-ZM** | 1.2 | | ● | ● | ● | | | | | | | | | | | ● | | | | | | | | | | | |
| | | **CNMG120416-ZM** | 1.6 | | ● | ● | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Medium cutting | **DM** | **CNMG120404-DM** | 0.4 | | ● | ● | | | | | | | | | | | | | | | | | | | | | | | |
| | | **CNMG120408-DM** | 0.8 | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | **CNMG120412-DM** | 1.2 | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | **All-round** | **CNMG090304** | 0.4 | | ● | ● | | | | | | | | | | | | | | | | ● | | | | | | | |
| | | **CNMG090308** | 0.8 | ● | ● | ● | ● | | | | | | | | | | | | ● | | | ● | | | | | | | |
| | | **CNMG120404** | 0.4 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | ● | | | | ● | | | | ● | | | |
| | | **CNMG120408** | 0.8 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | ● | | | | ● | ● | | | ● | | | |
| | | **CNMG120412** | 1.2 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | | ● | | | ● | | | |
| | | **CNMG120416** | 1.6 | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | |
| | | **CNMG160608** | 0.8 | ● | ● | ● | ● | | ● | ● | ● | | ● | | | | | | | | | | | | | | | | |
| | | **CNMG160612** | 1.2 | ● | ● | ● | ● | ● | ● | ● | ● | | ● | | | | | | | | | | | | | | | | |
| | | **CNMG160616** | 1.6 | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | |
| | | **CNMG190608** | 0.8 | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | **CNMG190612** | 1.2 | ● | ● | ● | ● | ● | ● | ● | ● | | ● | | | | | | | | | | | | | | | | |
| | | **CNMG190616** | 1.6 | | ● | ● | ● | ● | ● | ● | ● | | ● | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

● : Line-up

| | | | |
|---|---|---|---|
| External toolholders | → **B200 -** | Internal toolholders | → **B274 -** |
| J series toolholders | → **B342** | TungCap | → **B215, F046 -** |
| PINZBOHR® | → **F136 - F151** | Cartridges | → **F152 -** |

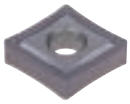
● : Continuous cutting
ɔ : Light interrupted cutting
✣ : Heavy interrupted cutting

## NEGATIVE TYPE



**Rhombic, 80° with hole**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ●ɔ | ɔ✣ | ✣ | ● | ●ɔ | ɔ | ●ɔ | | | | ●ɔ | | | | ●ɔ | | | | ● | | | | | | | | | |
| M | Stainless | | | | ● | ●ɔ | ɔ | ●ɔ | | | | | | | | | | | | ● | | | | | | | | | |
| K | Cast iron | ●ɔ | | | ● | ●ɔ | ɔ | ●ɔ | | | | ●ɔ | | | | ●ɔ | | | | ● | | | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | | ● | | | | | | | | | |
| S | Superalloys | | | | ● | ●ɔ | ● | | | | | | | | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | | | | Coated cermet | | | Cermet | | | Uncoated | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9115 | T9125 | T9135 | AH110 | AH120 | AH725 | GH330 | | GT720 | | | NS9530 | | | TH10 | | | | | | | | | | | |
| Finishing to medium cutting | 27 | CNMG120404-27 | 0.4 | ● | ● | | | | | | | | | | ● | | | | | | | | | | | | | | |
| |  | CNMG120408-27 | 0.8 | ● | ● | ● | | | | | | | | | ● | | | | | | | | | | | | | | |
| Medium cutting | 28 | CNMG120404-28 | 0.4 | | ● | | ● | ● | | | | | | | | | | | | | | | | | | | | | |
| |  | CNMG120408-28 | 0.8 | | | | ● | ● | | | | | | | | | | | | | | | | | | | | | |
| | 33 | CNMG120408-33 | 0.8 | | | | ● | | | | | ● | | | | | | | | | | | | | | | | | |
| |  | CNMG120416-33 | 1.6 | ● | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | CNMG160612-33 | 1.2 | ● | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | CNMG190612-33 | 1.2 | ● | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 37 | CNMG120404-37 | 0.4 | ● | | | | | | | | | | | ● | | | | | | | | | | | | | | |
| |  | CNMG120408-37 | 0.8 | ● | | | | | | ● | | | | | ● | | | ● | | | | | | | | | | | |
| | | CNMG120412-37 | 1.2 | ● | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 38 | CNMG120404-38 | 0.4 | | | | | | | ● | | | | | | | | | | | | | | | | | | | |
| |  | CNMG120408-38 | 0.8 | ● | | | | | ● | ● | | | | | | | | | | | | | | | | | | | |

● : Line-up

| | | | |
|---|---|---|---|
| External toolholders | → **B206 -** | Internal toolholders | → **B292 -** |
| J series toolholders | → **B342** | TungCap | → **B215, F046 -** |
| PINZBOHR® | → **F136 - F151** | Cartridges | → **F152 -** |

# TurnLine - Insert

● : Continuous cutting
ɔ : Light interrupted cutting
✣ : Heavy interrupted cutting

## NEGATIVE TYPE



**Rhombic, 80° with hole**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ɔ | ✣ | ɔ✣ | ✣ | | | | | ɔ | | | | ● | | | | | | ●ɔ | | | | ● | | | |
| M | Stainless | ● | ɔ | ɔ | ✣ | | | | | ɔ | ● | ɔ | | ● | | | | | | | | | | ● | | | |
| K | Cast iron | | | | | ●ɔ | ● | ɔ | ✣ | ɔ | | | | ● | | | | | | ●ɔ | | | | ● | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | | | | | | ● | | | |
| S | Superalloys | | | | | | | | | ● | ● | ɔ | ɔ | ● | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | | | | | | | | | | Cermet | | | | Uncoated | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T6120 | T6130 | AH630 | AH645 | T515 | T5105 | T5115 | T5125 | AH725 | AH8005 | AH8015 | AH905 | GH110 | | | | | | TH10 | | | | |
| Medium cutting | SM | CNMG090404E-SM | 0.4 | ● | ● | ● | | | | | | | | | | | | | | | | | | | | |
| | | CNMG090408E-SM | 0.8 | ● | ● | ● | | | | | | | | | | | | | | | | | | | | |
| | | CNMG090412E-SM | 1.2 | ● | ● | ● | | | | | | | | | | | | | | | | | | | | |
| | | CNMG120404-SM | 0.4 | ● | ● | ● | ● | | | | | ● | | | | | | | | | | | | | | |
| | | CNMG120408-SM | 0.8 | ● | ● | ● | ● | | | | | ● | | | ● | | | | | | | | | | | |
| | | CNMG120412-SM | 1.2 | ● | ● | ● | ● | | | | | ● | | | | | | | | | | | | | | |
| | CM | CNMG120404-CM | 0.4 | | | | | | ● | ● | ● | | | | | | | | | | | | | | | |
| | | CNMG120408-CM | 0.8 | | | | | ● | ● | ● | ● | | | | | | | | | | | | | | | |
| | | CNMG120412-CM | 1.2 | | | | | ● | ● | ● | ● | | | | | | | | | | | | | | | |
| | | CNMG160608-CM | 0.8 | | | | | | ● | ● | ● | | | | | | | | | | | | | | | |
| | | CNMG160612-CM | 1.2 | | | | | | ● | ● | ● | | | | | | | | | | | | | | | |
| | P | CNGG120404R-P | 0.4 | | | | | | | | | | | | | ● | | | | | | ● | | | | |
| | | CNGG120404L-P | 0.4 | | | | | | | | | | | | | ● | | | | | | ● | | | | |
| | | CNGG120408R-P | 0.8 | | | | | | | | | | | | | ● | | | | | | ● | | | | |
| | | CNGG120408L-P | 0.8 | | | | | | | | | | | | | ● | | | | | | ● | | | | |
| Finishing to medium cutting | HRM | CNMG120404-HRM | 0.4 | | | | | | | | | | ● | ● | | | | | | | | | | | | |
| | | CNMG120408-HRM | 0.8 | | | | | | | | | | ● | ● | | | | | | | | | | | | |
| | | CNMG120412-HRM | 1.2 | | | | | | | | | | ● | ● | | | | | | | | | | | | |
| | | CNMG160608-HRM | 0.8 | | | | | | | | | | ● | ● | | | | | | | | | | | | |
| | | CNMG160612-HRM | 1.2 | | | | | | | | | | ● | ● | | | | | | | | | | | | |
| | | CNMG190612-HRM | 1.2 | | | | | | | | | | ● | ● | | | | | | | | | | | | |
| | | CNMG190616-HRM | 1.6 | | | | | | | | | | ● | ● | | | | | | | | | | | | |
| Medium cutting | HMM | CNMG120404-HMM | 0.4 | | | | | | | | | | | | ● | | | | | | | | | | | |
| | | CNMG120408-HMM | 0.8 | | | | | | | | | | | | ● | | | | | | | | | | | |
| | | CNMG120412-HMM | 1.2 | | | | | | | | | | | | ● | | | | | | | | | | | |
| | | CNMG160608-HMM | 0.8 | | | | | | | | | | | | ● | | | | | | | | | | | |
| | | CNMG160612-HMM | 1.2 | | | | | | | | | | | | ● | | | | | | | | | | | |
| | | CNMG160616-HMM | 1.6 | | | | | | | | | | | | ● | | | | | | | | | | | |

● : Line-up

External toolholders → B200 -
J series toolholders → B342
PINZBOHR® → F136 - F151
Internal toolholders → B274 -
TungCap → B215, F046 -
Cartridges → F152 -

● : Continuous cutting
c : Light interrupted cutting
✣ : Heavy interrupted cutting

## NEGATIVE TYPE



**Rhombic, 80° with hole**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ● | ●c | c✣ | ✣ | c | ✣ | c✣ | ✣ | ● | ●c | ●c | | | ●c | | | | ●c | | | | | | | | | | |
| M | Stainless | | | | | ● | c | c | ✣ | ● | ●c | ●c | | | | | | | | | | | | | | | | | |
| K | Cast iron | ●c | ●c | | | | | | | ● | ●c | ●c | | | ●c | | | | ●c | | | | c✣ | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | | | | | c✣ | | | | | | |
| S | Superalloys | | | | | | | | | ● | ●c | | | | | | | | | | | | c✣ | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | | | | | | | Coated cermet | | | | Cermet | | | | Uncoated | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9105 | T9115 | T9125 | T9135 | T6120 | T6130 | AH630 | AH645 | AH110 | AH120 | GH330 | GT720 | | | | NS9530 | | | | KS20 | | | | | | |
| Medium cutting | SA | CNMG120404-SA | 0.4 | | | | | ● | ● | ● | ● | | ● | | | | | | | | | | | | | | | | |
| | | CNMG120408-SA | 0.8 | | | | | ● | ● | ● | ● | ● | ● | | | | | | | | | | ● | | | | | | |
| | | CNMG120412-SA | 1.2 | | | | | ● | ● | ● | ● | | ● | | | | | | | | | | ● | | | | | | |
| | | CNMG190612-SA | 1.2 | | | | | | | | | | ● | | | | | | | | | | ● | | | | | | |
| | | CNMG190616-SA | 1.6 | | | | | | | | | | | | | | | | | | | | ● | | | | | | |
| | S | CNMG120404R-S | 0.4 | | | ● | ● | | ● | ● | ● | | | ● | ● | | | | ● | | | | | | | | | | |
| | | CNMG120404L-S | 0.4 | | | ● | ● | | ● | ● | ● | | | ● | | | | | ● | | | | | | | | | | |
| | | CNMG120408R-S | 0.8 | | | ● | ● | | ● | ● | ● | | | ● | ● | | | | ● | | | | | | | | | | |
| | | CNMG120408L-S | 0.8 | | | ● | ● | | ● | ● | ● | | | ● | | | | | ● | | | | | | | | | | |
| Medium to heavy cutting | TH | CNMG120408-TH | 0.8 | ● | ● | ● | ● | | ● | | | | ● | | | | | | | | | | | | | | | | |
| | | CNMG120412-TH | 1.2 | ● | ● | ● | ● | | ● | | | | ● | | | | | | | | | | | | | | | | |
| | | CNMG120416-TH | 1.6 | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | CNMG160612-TH | 1.2 | ● | ● | ● | ● | | | | | | ● | | | | | | | | | | | | | | | | |
| | | CNMG160616-TH | 1.6 | ● | ● | ● | ● | | | | | | ● | | | | | | | | | | | | | | | | |
| | | CNMG190612-TH | 1.2 | ● | ● | ● | ● | | | | | | ● | | | | | | | | | | | | | | | | |
| | | CNMG190616-TH | 1.6 | ● | ● | ● | ● | | | | | | ● | | | | | | | | | | | | | | | | |
| | THS | CNMG120408-THS | 0.8 | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | CNMG120412-THS | 1.2 | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | CNMG120416-THS | 1.6 | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | CNMG160612-THS | 1.2 | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | CNMG160616-THS | 1.6 | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | CNMG190612-THS | 1.2 | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | CNMG190616-THS | 1.6 | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | CNMG190624-THS | 2.4 | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | CNMG250924-THS | 2.4 | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | |

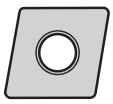
● : Line-up


External toolholders → B206 -
J series toolholders → B342
PINZBOHR® → F136 - F151
Internal toolholders → B292 -
TungCap → B215, F046 -
Cartridges → F152 -

# TurnLine - Insert

● : Continuous cutting
◐ : Light interrupted cutting
✣ : Heavy interrupted cutting

## NEGATIVE TYPE



**Rhombic, 80° with hole**

| | | |

● : Continuous cutting
ⓒ : Light interrupted cutting
✣ : Heavy interrupted cutting

## NEGATIVE TYPE



**Rhombic, 80° with hole**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ● | | | | | | | | ●ⓒ | | | | ● | | | | | | | | | | | | | | | |
| M | Stainless | | | | | | | | | | | | | ● | | | | | | | | | | | | | | | |
| K | Cast iron | ●ⓒ | ●ⓒ | ● | ⓒ | ✣ | | | | ●ⓒ | | | | ● | | | | ●ⓒ | ● | | | | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | ● | | | | | | | | | | | | | | | |
| S | Superalloys | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | ● | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | | | Cermet | | | Uncoated | | | Ceramics | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9105 | T515 | T5105 | T5115 | T5125 | | | NS520 | | | TH10 | | | FX105 | LX21 | LX11 | | | | | | | | | | |
| Finishing to medium cutting | - | CNMA120404 | 0.4 | | | ● | ● | ● | | | | | | ● | | | | | | | | | | | | | | | |
| | | CNMA120408 | 0.8 | ● | ● | ● | ● | ● | | | ● | | | ● | | | ● | | | | | | | | | | | | |
| | | CNMA120412 | 1.2 | ● | ● | ● | ● | ● | | | | | | ● | | | ● | | | | | | | | | | | | |
| | | CNMA120416 | 1.6 | ● | | ● | ● | ● | | | | | | ● | | | ● | | | | | | | | | | | | |
| | | CNMA160608 | 0.8 | | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | |
| | | CNMA160612 | 1.2 | | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | |
| | | CNMA160616 | 1.6 | | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | |
| | | CNMA190612 | 1.2 | | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | |
| | | CNMA190616 | 1.6 | | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | |
| | Wiper | CNMA120408W | 0.8 | | | | | | | | | | | | | | ● | | | | | | | | | | | | |
| | | CNMA120412W | 1.2 | | | | | | | | | | | | | | ● | | ● | | | | | | | | | | |
| | | CNMA120416W | 1.6 | | | | | | | | | | | | | | ● | | | | | | | | | | | | |
| | - | CNGA120404 | 0.4 | | | | | | | | | | | | | | | ● | ● | | | | | | | | | | |
| | | CNGA120408 | 0.8 | | | | | | | | ● | | | | | | ● | ● | ● | | | | | | | | | | |
| | | CNGA120412 | 1.2 | | | | | | | | | | | | | | ● | ● | ● | | | | | | | | | | |
| | | CNGA120416 | 1.6 | | | | | | | | | | | | | | ● | | ● | | | | | | | | | | |
| | | CNGA120420 | 2.0 | | | | | | | | | | | | | | | | ● | | | | | | | | | | |

● : Line-up

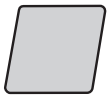
Insert
Negative
C

| | | | |
|---|---|---|---|
| External toolholders | → **B206 -** | Internal toolholders | → **B292 -** |
| TungCap | → **B215, F046 -** | PINZBOHR® | → **F136 - F151** |
| Cartridges | → **F152 -** | | |

# TurnLine - Insert

● : Continuous cutting
◐ : Light interrupted cutting
✣ : Heavy interrupted cutting

## NEGATIVE TYPE



**Rhombic, 80° without hole**

| | | FX105 | LX21 | LX11 | CX710 |
|---|---|---|---|---|---|
| P | Steel | | | | |
| M | Stainless | | | | |
| K | Cast iron | ●◐ | ● | | ●◐ |
| N | Non-ferrous | | | | |
| S | Superalloys | | | | |
| H | Hard materials | | | ● | |

| Application | Chipbreaker | Designation | Corner radius | Ceramics FX105 | LX21 | LX11 | CX710 |
|---|---|---|---|---|---|---|---|
| Finishing to medium cutting | - | CNGD120712 | 1.2 | ● | | | |
| | | CNGD120716 | 1.6 | ● | | | |
| | - | CNMN120408 | 0.8 | ● | | | |
| | | CNMN120412 | 1.2 | ● | | | |
| | - | CNGN120404 | 0.4 | | | ● | |
| | | CNGN120408 | 0.8 | ● | | ● | |
| | | CNGN120412 | 1.2 | ● | | ● | |
| | | CNGN120416 | 1.6 | ● | ● | ● | |
| | | CNGN120420 | 2.0 | ● | | | |
| | | CNGN120708 | 0.8 | ● | | ● | |
| | | CNGN120712 | 1.2 | ● | | ● | |
| | | CNGN120716 | 1.6 | ● | | ● | |
| | | CNGN120720 | 2.0 | | | ● | |
| | - | CNGX120712 | 1.2 | ● | | | |
| | | CNGX120716 | 1.6 | ● | | | ● |
| | | CNMX120716 | 1.6 | ● | | | |

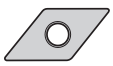
● : Line-up

CNGD... : External toolholders → **B254**

CNMN..., CNGN... : External toolholders → **B233**, Internal toolholders → **B311**

● : Continuous cutting
ɔ : Light interrupted cutting
✣ : Heavy interrupted cutting

## NEGATIVE TYPE



**Rhombic, 55° with hole**

| | | Coating | | | | | | | | | Coated cermet | | | | Cermet | | | | Uncoated | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | T9105 | T9115 | T9125 | T9135 | AH120 | GH110 | | | | GT9530 | GT720 | | | NS9530 | NS520 | | | TH10 | | | | | | | |
| P | Steel | ● | ●ɔ | ɔ✣ | ✣ | ●ɔ | ● | | | | ●ɔ | ●ɔ | | | ●ɔ | ●ɔ | | | ● | | | | | | | |
| M | Stainless | | | | | ●ɔ | ● | | | | | | | | | | | | ● | | | | | | | |
| K | Cast iron | ●ɔ | ●ɔ | | | ●ɔ | ● | | | | ●ɔ | ●ɔ | | | ●ɔ | ●ɔ | | | ● | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | ● | | | | | | | |
| S | Superalloys | | | | | ●ɔ | ● | | | | | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | |

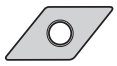
| Application | Chipbreaker | Designation | Corner radius | T9105 | T9115 | T9125 | T9135 | AH120 | GH110 | GT9530 | GT720 | NS9530 | NS520 | TH10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Precision finishing | **TF** | **DNMG150404-TF** | 0.4 | | | | | | | | | ● | | ● |
| | | **DNMG150408-TF** | 0.8 | | | | | | | | | ● | | |
| | **01** | **DNGG110402-01** | 0.2 | | | | | | | | | ● | | |
| | | **DNGG110404-01** | 0.4 | | | | | | | | | ● | ● | |
| | | **DNGG110408-01** | 0.8 | | | | | | | | ● | ● | | |
| | | **DNGG150402-01** | 0.2 | | | | | | | | | ● | ● | ● |
| | | **DNGG150404-01** | 0.4 | | | | | | ● | | | ● | ● | ● |
| | | **DNGG150408-01** | 0.8 | | | | | | ● | | | ● | ● | ● |
| Finishing | **TSF** | **DNMG110404E-TSF** | 0.4 | | ● | ● | | | | ● | | ● | | |
| | | **DNMG110408E-TSF** | 0.8 | | ● | ● | | | | ● | | ● | | |
| | | **DNMG110412E-TSF** | 1.2 | | ● | ● | | | | ● | | ● | | |
| | | **DNMG150404-TSF** | 0.4 | ● | ● | ● | ● | ● | | ● | | ● | | |
| | | **DNMG150408-TSF** | 0.8 | ● | ● | ● | ● | ● | | ● | | ● | | |
| | | **DNMG150412-TSF** | 1.2 | ● | ● | ● | ● | ● | | | | | | |
| | | **DNMG150604-TSF** | 0.4 | | ● | ● | | | | ● | | ● | | |
| | | **DNMG150608-TSF** | 0.8 | ● | ● | ● | ● | | | ● | | ● | | |
| | | **DNMG150612-TSF** | 1.2 | ● | ● | ● | ● | | | | | | | |
| Finishing (Wiper) | **FW** | **DNMG110404E-FW** | 0.4 | | ● | | | | | | | | | |
| | | **DNMG110408E-FW** | 0.8 | | ● | | | | | | | | | |
| | | **DNMG150404-FW** | 0.4 | | ● | | | | | | | | | |
| | | **DNMG150408-FW** | 0.8 | | ● | | | | | | | | | |
| | | **DNMG150604-FW** | 0.4 | | ● | | | | | | | | | |
| | | **DNMG150608-FW** | 0.8 | | ● | | | | | | | | | |
| Finishing | **ZF** | **DNMG110404E-ZF** | 0.4 | | ● | ● | | | | | | | | |
| | | **DNMG150404-ZF** | 0.4 | | ● | ● | ● | | | ● | | ● | | |
| | | **DNMG150408-ZF** | 0.8 | | ● | ● | ● | | | ● | | ● | | |
| | | **DNMG150412-ZF** | 1.2 | | ● | ● | ● | | | | | | | |
| | | **DNMG150604-ZF** | 0.4 | | ● | ● | | | | | | | | |
| | | **DNMG150608-ZF** | 0.8 | | ● | ● | ● | | | | | | | |
| | | **DNMG150612-ZF** | 1.2 | | ● | ● | | | | | | | | |

● : Line-up


External toolholders → **B201 -**
J series toolholders → **B342**
Internal toolholders → **B276 -**
TungCap → **B215, F046 -**

● : Continuous cutting
ⓒ : Light interrupted cutting
✣ : Heavy interrupted cutting

## NEGATIVE TYPE



**Rhombic, 55° with hole**

| | | |
|---|---|---|
| P | Steel | ●ⓒ ⓒ ✣ ⓒ✣ ● ● ● ●ⓒ ● ● ● ●ⓒ ● ● ● ● ● ● ● ● |
| M | Stainless | ● ⓒ ✣ ⓒ ● ● ● ●ⓒ ● ● ● ● ● ● ● ● |
| K | Cast iron | ●ⓒ ● ● ● ⓒ ● ●ⓒ ● ● ● ●ⓒ ● ● ● ● ● ● ● ● |
| N | Non-ferrous | ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● |
| S | Superalloys | ● ⓒ ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● |
| H | Hard materials | ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● |

| Application | Chipbreaker | Designation | Corner radius | Coating T9115 | T6120 | T6130 | AH630 | T5105 | T5115 | AH8005 | AH8015 | GH330 | Cermet NS9530 | Uncoated TH10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Finishing | 11 | DNMG110404-11 | 0.4 | | | | | | | | | | ● | |
| | | DNMG110408-11 | 0.8 | | | | | | | | | | ● | |
| | | DNMG150404-11 | 0.4 | | | | | | | | | ● | ● | ● |
| | | DNMG150408-11 | 0.8 | ● | | | | | | | | | ● | |
| Finishing of mild steels | 17 | DNMG150404-17 | 0.4 | | | | | | | | | | ● | |
| | | DNMG150408-17 | 0.8 | | | | | | | | | | ● | |
| Finishing | SF | DNMG150404-SF | 0.4 | | ● | ● | ● | | | | | | | |
| | | DNMG150408-SF | 0.8 | | ● | ● | ● | | | | | | | |
| | | DNMG150604-SF | 0.4 | | ● | ● | ● | | | | | | | |
| | | DNMG150608-SF | 0.8 | | ● | ● | ● | | | | | | | |
| | CF | DNMG150404-CF | 0.4 | | | | | ● | ● | | | | | |
| | | DNMG150408-CF | 0.8 | | | | | ● | ● | | | | | |
| | | DNMG150412-CF | 1.2 | | | | | ● | ● | | | | | |
| | | DNMG150604-CF | 0.4 | | | | | ● | ● | | | | | |
| | | DNMG150608-CF | 0.8 | | | | | ● | ● | | | | | |
| | | DNMG150612-CF | 1.2 | | | | | ● | ● | | | | | |
| | HRF | DNMG150404-HRF | 0.4 | | | | | | | ● | ● | | | |
| | | DNMG150408-HRF | 0.8 | | | | | | | ● | ● | | | |
| | | DNMG150604-HRF | 0.4 | | | | | | | ● | ● | | | |
| | | DNMG150608-HRF | 0.8 | | | | | | | ● | ● | | | |

● : Line-up

External toolholders → B201 -
J series toolholders → B342
Internal toolholders → B276 -
TungCap → B215, F046 -

● : Continuous cutting
◐ : Light interrupted cutting
✣ : Heavy interrupted cutting

## NEGATIVE TYPE



**Rhombic, 55° with hole**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ● | ●◐ | ◐✣ | ✣ | | | | | ●◐ | | | | | ●◐ | ●◐ | | | | | | | | | | | | | | | | |
| M | Stainless | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| K | Cast iron | ●◐ | ●◐ | | | | | | | ●◐ | | | | | ●◐ | ●◐ | | | | | | | | | | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S | Superalloys | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | | | Coated cermet | | | | Cermet | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9105 | T9115 | T9125 | T9135 | | | | GT9530 | | | | NS9530 | NS520 | | | | | | | | | | | | | | | | |
| Finishing | **TS** | **DNMG150404-TS** | 0.4 | | ● | ● | ● | | | | ● | | | | ● | ● | | | | | | | | | | | | | | | | |
| |  | **DNMG150408-TS** | 0.8 | ● | ● | ● | ● | | | | ● | | | | ● | ● | | | | | | | | | | | | | | | | |
| | | **DNMG150412-TS** | 1.2 | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | **DNMG150604-TS** | 0.4 | | | | | | | | ● | | | | ● | ● | | | | | | | | | | | | | | | | |
| | | **DNMG150608-TS** | 0.8 | | ● | ● | | | | | ● | | | | ● | ● | | | | | | | | | | | | | | | | |
| | | **DNMG150612-TS** | 1.2 | | ● | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Finishing to medium cutting (Wiper) | **SW** | **DNMG110408E-SW** | 0.8 | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| |  | **DNMG110412E-SW** | 1.2 | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | **DNMG150408-SW** | 0.8 | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | **DNMG150412-SW** | 1.2 | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | **DNMG150608-SW** | 0.8 | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | **DNMG150612-SW** | 1.2 | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| High feed, small depth of cutting | **AS** | **DNMG150404-AS** | 0.4 | | ● | | ● | | | | | | | | ● | | | | | | | | | | | | | | | | | |
| |  | **DNMG150408-AS** | 0.8 | | ● | ● | ● | | | | | | | | ● | | | | | | | | | | | | | | | | | |
| | | **DNMG150412-AS** | 1.2 | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | **DNMG150604-AS** | 0.4 | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | **DNMG150608-AS** | 0.8 | | ● | ● | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | **DNMG150612-AS** | 1.2 | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Boring (Double sided) | **CB** | **DNMG110404-CB** | 0.4 | | | | | | | | ● | | | | ● | | | | | | | | | | | | | | | | | |
| |  | **DNMG110408-CB** | 0.8 | | ● | | | | | | ● | | | | ● | | | | | | | | | | | | | | | | | |
| Finishing | **NS** | **DNMG150404-NS** | 0.4 | | | ● | | | | | | | | | ● | | | | | | | | | | | | | | | | | |
| |  | **DNMG150408-NS** | 0.8 | ● | ● | ● | | | | | | | | | ● | | | | | | | | | | | | | | | | | |

● : Line-up

External toolholders → **B201 -**
J series toolholders → **B342**
Internal toolholders → **B276 -**
TungCap → **B215, F046 -**

● : Continuous cutting
c : Light interrupted cutting
✣ : Heavy interrupted cutting

## NEGATIVE TYPE



**Rhombic, 55° with hole**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ● | ●c | c✣ | ✣ | c | ✣ | c✣ | ✣ | ● | ●c | ●c | | | ●c | | | | | ●c | | | | | | | | | |
| M | Stainless | | | | | ● | c | c | ✣ | ● | ●c | ●c | | | | | | | | | | | | | | | | | |
| K | Cast iron | ●c | ●c | | | | | | | ● | ●c | ●c | | | ●c | | | | | ●c | | | | | | | c✣ | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | | | | | | | | | c✣ | | |
| S | Superalloys | | | | | | | | | ● | ●c | | | | | | | | | | | | | | | | c✣ | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | | | | | | | Coated cermet | | | | Cermet | | | | Uncoated | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9105 | T9115 | T9125 | T9135 | T6120 | T6130 | AH630 | AH645 | AH110 | AH120 | GH330 | GT9530 | | | | NS9530 | | | | KS20 | | | | | |
| Finishing | SS | DNMG110404E-SS | 0.4 | | | | | | | ● | ● | | | | | | | | | | | | | | | | | |
| | | DNMG110408E-SS | 0.8 | | | | | | | ● | ● | | | | | | | | | | | | | | | | | |
| | | DNMG150404-SS | 0.4 | | | | | ● | ● | ● | ● | | | ● | | | | | | | | | | | | | | |
| | | DNMG150408-SS | 0.8 | | | | | ● | ● | ● | ● | | | ● | | | | | | | | | ● | | | | | |
| | | DNMG150412-SS | 1.2 | | | | | ● | ● | ● | ● | | | | | | | | | | | | | | | | | |
| | | DNMG150604-SS | 0.4 | | | | | ● | ● | ● | ● | | | ● | | | | | | | | | | | | | | |
| | | DNMG150608-SS | 0.8 | | | | | ● | ● | ● | ● | | | ● | | | | | | | | | | | | | | |
| | | DNMG150612-SS | 1.2 | | | | | ● | ● | ● | ● | | | | | | | | | | | | | | | | | |
| Medium cutting | TM | DNMG110404E-TM | 0.4 | | ● | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | DNMG110408E-TM | 0.8 | | ● | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | DNMG110412E-TM | 1.2 | | ● | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | DNMG110404-TM | 0.4 | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | |
| | | DNMG110408-TM | 0.8 | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | |
| | | DNMG150404-TM | 0.4 | ● | ● | ● | ● | | | | | | ● | | | | | | | | | | | | | | | |
| | | DNMG150408-TM | 0.8 | ● | ● | ● | ● | | | | | | ● | | | | | | | | | | | | | | | |
| | | DNMG150412-TM | 1.2 | ● | ● | ● | ● | | | | | ● | ● | | | | | | | | | | | | | | | |
| | | DNMG150416-TM | 1.6 | | ● | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | DNMG150604-TM | 0.4 | ● | ● | ● | ● | | | | | | ● | | | | | | | | | | | | | | | |
| | | DNMG150608-TM | 0.8 | ● | ● | ● | ● | | | | | | ● | | | | | | | | | | | | | | | |
| | | DNMG150612-TM | 1.2 | ● | ● | ● | ● | | | | | | ● | | | | | | | | | | | | | | | |
| | | DNMG150616-TM | 1.6 | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | |
| Finishing to medium cutting | AM | DNMG150408-AM | 0.8 | | ● | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | DNMG150412-AM | 1.2 | | ● | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | DNMG150416-AM | 1.6 | | ● | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | DNMG150608-AM | 0.8 | | ● | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | DNMG150612-AM | 1.2 | | ● | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | DNMG150616-AM | 1.6 | | ● | ● | | | | | | | | | | | | | | | | | | | | | | |
| | NM | DNMG150408-NM | 0.8 | | ● | ● | ● | | | | | | | | ● | | | | ● | | | | | | | | | |
| | | DNMG150412-NM | 1.2 | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | |
| | | DNMG150608-NM | 0.8 | | | | | | | | | | | | ● | | | | ● | | | | | | | | | |

● : Line-up

External toolholders → B201 -
J series toolholders → B342
Internal toolholders → B276 -
TungCap → B215, F046 -

● : Continuous cutting
c : Light interrupted cutting
✣ : Heavy interrupted cutting

## NEGATIVE TYPE



**Rhombic, 55° with hole**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ● | ●c | c✣ | ✣ | | | | | ● | ●c | | | | ●c | | | | ●c | ●c | | | ● | | | | |
| M | Stainless | | | | | | | | | ● | ●c | | | | | | | | | | | | ● | | | | |
| K | Cast iron | ●c | ●c | | | ●c | ● | c | ✣ | ● | ●c | | | | ●c | | | | ●c | ●c | | | ● | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | | | | | ● | | | | |
| S | Superalloys | | | | | | | | | ● | ●c | | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | | | | | | | Coated cermet | | | | Cermet | | | | Uncoated | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9105 | T9115 | T9125 | T9135 | T515 | T5105 | T5115 | T5125 | AH110 | AH120 | | GT9530 | | | | NS9530 | NS520 | | | TH10 | | | | |
| Finishing to medium cutting | **TQ** | **DNMG150404-TQ** | 0.4 | | | | | | | | | | | | ● | | | | ● | | | | | | | | |
| | | **DNMG150408-TQ** | 0.8 | | | | | | | | | | | | ● | | | | ● | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | **ZM** | **DNMG110408E-ZM** | 0.8 | | ● | ● | | | | | | | | | | | | | | | | | | | | | |
| | | **DNMG150408-ZM** | 0.8 | | ● | ● | ● | | | | | | | | ● | | | | ● | | | | | | | | |
| | | **DNMG150412-ZM** | 1.2 | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | |
| | | **DNMG150608-ZM** | 0.8 | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | |
| | | **DNMG150612-ZM** | 1.2 | | ● | ● | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Medium cutting | **DM** | **DNMG150408-DM** | 0.8 | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | |
| | | **DNMG150412-DM** | 1.2 | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | | | |
| | | **DNMG150604-DM** | 0.4 | | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | **DNMG150608-DM** | 0.8 | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | |
| | | **DNMG150612-DM** | 1.2 | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | | | |
| | | **DNMG150616-DM** | 1.6 | ● | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | **All-round** | **DNMG110404** | 0.4 | | ● | ● | | | ● | ● | ● | | | | ● | | | | ● | | | | | | | | |
| | | **DNMG110408** | 0.8 | ● | ● | ● | ● | | ● | ● | ● | | | | ● | | | | ● | | | | | | | | |
| | | **DNMG150404** | 0.4 | | ● | ● | ● | | ● | ● | ● | ● | ● | | ● | | | | ● | ● | | | ● | | | | |
| | | **DNMG150408** | 0.8 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | | | | ● | ● | | | ● | | | | |
| | | **DNMG150412** | 1.2 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | ● | ● | | | ● | | | | |
| | | **DNMG150416** | 1.6 | | ● | ● | | | ● | ● | ● | | | | | | | | | | | | | | | | |
| | | **DNMG150604** | 0.4 | | ● | ● | | | ● | ● | ● | | | | | | | | | | | | ● | | | | |
| | | **DNMG150608** | 0.8 | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | | | | ● | | | | |
| | | **DNMG150612** | 1.2 | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | | | | ● | | | | |
| | | **DNMG150616** | 1.6 | | ● | ● | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Finishing to medium cutting | **27** | **DNMG150404-27** | 0.4 | | | ● | | | | | | | | | | | | | ● | | | | | | | | |
| | | **DNMG150408-27** | 0.8 | | ● | ● | | | | | | | | | | | | | ● | | | | | | | | |
| | | **DNMG150412-27** | 1.2 | | | ● | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |

● : Line-up


External toolholders → B201 -
J series toolholders → B342, B343
Internal toolholders → B276 -
TungCap → B215, F046 -

# TurnLine - Insert

● : Continuous cutting
ɔ : Light interrupted cutting
✣ : Heavy interrupted cutting

## NEGATIVE TYPE



**Rhombic, 55° with hole**

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ɔ | ✣ | ●ɔ | ✣ | ● | ●ɔ | ●ɔ | | | | ●ɔ | | | | ●ɔ | | | | ●ɔ | | | | | |
| M | Stainless | ● | ɔ | ɔ | ✣ | ● | ●ɔ | ●ɔ | | | | | | | | | | | | | | | | | |
| K | Cast iron | | | | | ● | ●ɔ | ●ɔ | | | | ●ɔ | | | | ●ɔ | | | | ●ɔ | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | | | | | | | |
| S | Superalloys | | | | | ● | ●ɔ | | | | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | |

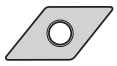
| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | | | | Coated cermet | | | Cermet | | | | Uncoated | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T6120 | T6130 | AH630 | AH645 | AH110 | AH120 | GH330 | | GT9530 | | | NS9530 | | | | TH10 | | | | | |
| Medium cutting | 28 | DNMG150404-28 | 0.4 | | | | | | ● | | | | | | | | | | | | | | | |
| | | DNMG150408-28 | 0.8 | | | | | | ● | | | | | | | | | | | | | | | |
| | 33 | DNMG150404-33 | 0.4 | | | | | ● | | | | | | | | | | | | | | | | |
| | | DNMG150408-33 | 0.8 | | | | | ● | | | | | | | | | | | ● | | | | | |
| | 37 | DNMG150404-37 | 0.4 | | | | | | | | | | | | ● | | | | | | | | | |
| | | DNMG150408-37 | 0.8 | | | | | | | ● | | | | | ● | | | | | | | | | |
| | Parallel | DNGG150404R | 0.4 | | | | | | | | | ● | | | ● | | | | | | | | | |
| | | DNGG150404L | 0.4 | | | | | | | | | ● | | | ● | | | | | | | | | |
| | | DNGG150408R | 0.8 | | | | | | | | | | | | ● | | | | | | | | | |
| | | DNGG150408L | 0.8 | | | | | | | | | | | | ● | | | | | | | | | |
| | SM | DNMG110404E-SM | 0.4 | ● | ● | ● | | | | | | | | | | | | | | | | | | |
| | | DNMG110408E-SM | 0.8 | ● | ● | ● | | | | | | | | | | | | | | | | | | |
| | | DNMG150404-SM | 0.4 | ● | ● | ● | ● | | | | | | | | | | | | | | | | | |
| | | DNMG150408-SM | 0.8 | ● | ● | ● | ● | | | | | | | | | | | | | | | | | |
| | | DNMG150412-SM | 1.2 | ● | ● | ● | ● | | | | | | | | | | | | | | | | | |
| | | DNMG150604-SM | 0.4 | ● | ● | ● | ● | | | | | | | | | | | | | | | | | |
| | | DNMG150608-SM | 0.8 | ● | ● | ● | ● | | | | | | | | | | | | | | | | | |
| | | DNMG150612-SM | 1.2 | ● | ● | ● | ● | | | | | | | | | | | | | | | | | |

● : Line-up

External toolholders → B201 -
J series toolholders → B342
Internal toolholders → B276 -
TungCap → B215, F046 -

● : Continuous cutting
◐ : Light interrupted cutting
✣ : Heavy interrupted cutting

## NEGATIVE TYPE



**Rhombic, 55° with hole**

| | | T9125 | T9135 | T6130 | AH630 | AH645 | T515 | T5105 | T5115 | T5125 | AH120 | AH8005 | AH8015 | AH905 | GH110 | GH330 | NS9530 | TH10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ◐✣ | ✣ | ✣ | ◐✣ | ✣ | | | | | ●◐ | | | | ● | ●◐ | | ● |
| M | Stainless | | | ◐ | ◐ | ✣ | | | | | ●◐ | ● | ◐ | | ● | ●◐ | | ● |
| K | Cast iron | | | | | | ●◐ | ● | ◐ | ✣ | ●◐ | | | | ● | ●◐ | ●◐ | ● |
| N | Non-ferrous | | | | | | | | | | | | | | | | | ● |
| S | Superalloys | | | | | | | | | | ●◐ | ● | ◐ | ◐ | ● | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | | | | | | | | | | Cermet | Uncoated |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9125 | T9135 | T6130 | AH630 | AH645 | T515 | T5105 | T5115 | T5125 | AH120 | AH8005 | AH8015 | AH905 | GH110 | GH330 | NS9530 | TH10 |
| Medium cutting | **CM** | **DNMG150404-CM** | 0.4 | | | | | | | ● | ● | ● | | | | | | | |
| | | **DNMG150408-CM** | 0.8 | | | | | | ● | ● | ● | ● | | | | | | | |
| | | **DNMG150412-CM** | 1.2 | | | | | | ● | ● | ● | ● | | | | | | | |
| | | **DNMG150604-CM** | 0.4 | | | | | | | ● | ● | ● | | | | | | | |
| | | **DNMG150608-CM** | 0.8 | | | | | | | ● | ● | ● | | | | | | | |
| | | **DNMG150612-CM** | 1.2 | | | | | | | ● | ● | ● | | | | | | | |
| | **P** | **DNGG150402R-P** | 0.2 | | | | | | | | | | | | | | ● | | ● |
| | | **DNGG150402L-P** | 0.2 | | | | | | | | | | | | | | ● | | ● |
| | | **DNGG150404R-P** | 0.4 | | | | | | | | | | | | | | ● | | ● |
| | | **DNGG150404L-P** | 0.4 | | | | | | | | | | | | | | ● | | ● |
| | | **DNGG150408R-P** | 0.8 | | | | | | | | | | | | | | | | ● |
| | | **DNGG150408L-P** | 0.8 | | | | | | | | | | | | | | | | ● |
| Finishing to medium cutting | **HRM** | **DNMG150404-HRM** | 0.4 | | | | | | | | | | | ● | ● | | | | |
| | | **DNMG150408-HRM** | 0.8 | | | | | | | | | | | ● | ● | | | | |
| | | **DNMG150412-HRM** | 1.2 | | | | | | | | | | | ● | ● | | | | |
| | | **DNMG150604-HRM** | 0.4 | | | | | | | | | | | ● | ● | | | | |
| | | **DNMG150608-HRM** | 0.8 | | | | | | | | | | | ● | ● | | | | |
| | | **DNMG150612-HRM** | 1.2 | | | | | | | | | | | ● | ● | | | | |
| Medium cutting | **HMM** | **DNMG150404-HMM** | 0.4 | | | | | | | | | | | | | ● | | | |
| | | **DNMG150408-HMM** | 0.8 | | | | | | | | | | | | | ● | | | |
| | | **DNMG150412-HMM** | 1.2 | | | | | | | | | | | | | ● | | | |
| | **SA** | **DNMG150404-SA** | 0.4 | | | | | | | | | | ● | | | | | | |
| | | **DNMG150408-SA** | 0.8 | | | | | | | | | | ● | | | | | | |
| | | **DNMG150604-SA** | 0.4 | | | | | | | | | | ● | | | | | | |
| | | **DNMG150608-SA** | 0.8 | | | | | | | | | | ● | | | | | | |
| | **S** | **DNMG150404R-S** | 0.4 | ● | ● | ● | ● | ● | | | | | | | | | | ● | |
| | | **DNMG150404L-S** | 0.4 | ● | ● | ● | ● | ● | | | | | | | | | | ● | |
| | | **DNMG150408R-S** | 0.8 | ● | ● | ● | ● | ● | | | | | | | | | | ● | |
| | | **DNMG150408L-S** | 0.8 | ● | ● | ● | ● | ● | | | | | | | | | | ● | |
| | | **DNMG150604R-S** | 0.4 | ● | ● | ● | ● | ● | | | | | | | | | | | |
| | | **DNMG150604L-S** | 0.4 | ● | ● | ● | ● | ● | | | | | | | | | | | |
| | | **DNMG150608R-S** | 0.8 | ● | ● | ● | ● | ● | | | | | | | | | | | |
| | | **DNMG150608L-S** | 0.8 | ● | ● | ● | ● | ● | | | | | | | | | | | |

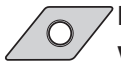
● : Line-up

External toolholders → **B207 -**
J series toolholders → **B342**
Internal toolholders → **B295 -**
TungCap → **B215, F046 -**

# TurnLine - Insert

● : Continuous cutting
ⓒ : Light interrupted cutting
✣ : Heavy interrupted cutting

## NEGATIVE TYPE



**Rhombic, 55° with hole**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ●ⓒ | ⓒ✣ | ✣ | ✣ | ⓒ✣ | ✣ | | | | | ●ⓒ | | ●ⓒ | | | | ●ⓒ | | | ● | | | | | | |
| M | Stainless | | | | ⓒ | ⓒ | ✣ | | | | | ●ⓒ | | | | | | | | | ● | | | | | | |
| K | Cast iron | ●ⓒ | | | | | | ●ⓒ | ● | ⓒ | ✣ | ●ⓒ | | ●ⓒ | | | | ●ⓒ | | | ● | | | ●ⓒ | ● | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | | | ● | | | | | | |
| S | Superalloys | | | | | | | | | | | ●ⓒ | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | | ● |

| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | | | | | | | Coated cermet | | | | Cermet | | | | Uncoated | | | Ceramics | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9115 | T9125 | T9135 | T6130 | AH630 | AH645 | T515 | T5105 | T5115 | T5125 | AH120 | GT720 | | | | NS520 | | | | TH10 | | | FX105 | LX21 | LX11 |
| Medium to heavy cutting | TH | DNMG150408-TH | 0.8 | ● | ● | ● | | | | | | | | ● | | | | | | | | | | | | | | |
| | | DNMG150412-TH | 1.2 | ● | ● | ● | | | | | | | | ● | | | | | | | | | | | | | | |
| | | DNMG150416-TH | 1.6 | ● | ● | | | | | | | | | | | | | | | | | | | | | | | |
| | | DNMG150608-TH | 0.8 | ● | ● | ● | | | | | | | | ● | | | | | | | | | | | | | | |
| | | DNMG150612-TH | 1.2 | ● | ● | ● | | | | | | | | ● | | | | | | | | | | | | | | |
| | | DNMG150616-TH | 1.6 | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | |
| | THS | DNMG150408-THS | 0.8 | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | DNMG150412-THS | 1.2 | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | DNMG150416-THS | 1.6 | ● | ● | | | | | | | | | | | | | | | | | | | | | | | |
| | | DNMG150608-THS | 0.8 | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | DNMG150612-THS | 1.2 | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | DNMG150616-THS | 1.6 | ● | ● | | | | | | | | | | | | | | | | | | | | | | | |
| | SH | DNMG150408-SH | 0.8 | | | | ● | ● | ● | | | | | | | | | | | | | | | | | | | |
| | | DNMG150412-SH | 1.2 | | | | ● | ● | ● | | | | | | | | | | | | | | | | | | | |
| | | DNMG150416-SH | 1.6 | | | | ● | ● | ● | | | | | | | | | | | | | | | | | | | |
| | | DNMG150608-SH | 0.8 | | | | ● | ● | ● | | | | | | | | | | | | | | | | | | | |
| | | DNMG150612-SH | 1.2 | | | | ● | ● | ● | | | | | | | | | | | | | | | | | | | |
| | CH | DNMG150404-CH | 0.4 | | | | | | | | ● | ● | ● | | | | | | | | | | | | | | | |
| | | DNMG150408-CH | 0.8 | | | | | | | ● | ● | ● | ● | | | | | | | | | | | | | | | |
| | | DNMG150412-CH | 1.2 | | | | | | | ● | ● | ● | ● | | | | | | | | | | | | | | | |
| | | DNMG150604-CH | 0.4 | | | | | | | | ● | ● | ● | | | | | | | | | | | | | | | |
| | | DNMG150608-CH | 0.8 | | | | | | | | ● | ● | ● | | | | | | | | | | | | | | | |
| | | DNMG150612-CH | 1.2 | | | | | | | | ● | ● | ● | | | | | | | | | | | | | | | |
| Finishing to medium cutting | - | DNMA150404 | 0.4 | | | | | | | ● | ● | ● | ● | | ● | | | | ● | | | | ● | | | | | |
| | | DNMA150408 | 0.8 | | | | | | | ● | ● | ● | ● | | | | | | | | | | ● | | | | | |
| | | DNMA150412 | 1.2 | | | | | | | | ● | ● | ● | | | | | | | | | | | | | | | |
| | | DNMA150604 | 0.4 | | | | | | | ● | ● | ● | ● | | | | | | | | | | | | | | | |
| | | DNMA150608 | 0.8 | | | | | | | ● | ● | ● | ● | | | | | | | | | | | | | | | |
| | | DNMA150612 | 1.2 | | | | | | | | ● | ● | ● | | | | | | | | | | | | | | | |
| | - | DNGA150404 | 0.4 | | | | | | | | | | | | | | | | ● | | | | ● | | | | ● | ● |
| | | DNGA150408 | 0.8 | | | | | | | | | | | | | | | | ● | | | | ● | | | ● | ● | ● |
| | | DNGA150412 | 1.2 | | | | | | | | | | | | | | | | | | | | | | | ● | ● | ● |
| | | DNGA150416 | 1.6 | | | | | | | | | | | | | | | | | | | | | | | ● | | |
| | | DNGA150608 | 0.8 | | | | | | | | | | | | | | | | | | | | | | | | | ● |
| | | DNGA150612 | 1.2 | | | | | | | | | | | | | | | | | | | | | | | | | ● |
| | | DNGA150616 | 1.6 | | | | | | | | | | | | | | | | | | | | | | | | | ● |
| | | DNGA150620 | 2.0 | | | | | | | | | | | | | | | | | | | | | | | | | ● |

● : Line-up

● : Continuous cutting
ⓒ : Light interrupted cutting
✣ : Heavy interrupted cutting

## NEGATIVE TYPE

**Rhombic, 55° without hole**

| | |
|---|---|
| P | Steel |
| M | Stainless |
| K | Cast iron |
| N | Non-ferrous |
| S | Superalloys |
| H | Hard materials |

| Application | Chipbreaker | Designation | Corner radius | Ceramics FX105 | Ceramics LX11 |
|---|---|---|---|---|---|
| Finishing to medium cutting | - | **DNGD150708** | 0.8 | ● | |
| | | **DNGD150712** | 1.2 | ● | |
| | | **DNGD150716** | 1.6 | ● | |
| | - | **DNGN150404** | 0.4 | | ● |
| | | **DNGN150408** | 0.8 | | ● |
| | | **DNGN150412** | 1.2 | ● | ● |
| | | **DNGN150416** | 1.6 | ● | |
| | | **DNGN150708** | 0.8 | | ● |
| | | **DNGN150712** | 1.2 | | ● |
| | | **DNGN150716** | 1.6 | | ● |
| | - | **DNGX150712** | 1.2 | ● | |
| | | **DNMX150716** | 1.6 | ● | |

● : Line-up

External toolholders → **B207 -** Internal toolholders → **B295 -**
J series toolholders → **B342** TungCap → **B215, F046 -**

DNGD... : External toolholders → **B254, B255**

DNGN... : External toolholders → **B234**, Internal toolholders → **B313**

# TurnLine - Insert

● : Continuous cutting
ɔ : Light interrupted cutting
✣ : Heavy interrupted cutting

## NEGATIVE TYPE



**Square, 90° with hole**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ●ɔ | ɔ✣ | | | | | ●ɔ | | | | | | ●ɔ | ●ɔ | ● | | | | | | | | | | | | | | | | | | |
| M | Stainless | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| K | Cast iron | ●ɔ | | | | | | ●ɔ | | | | | | ●ɔ | ●ɔ | ● | | | | | | | | | | | | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S | Superalloys | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | Coated cermet | | | | | Cermet | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9115 | T9125 | | | | GT9530 | | | | | NS9530 | NS520 | X407 | | | | | | | | | | | | | | | | | | |
| Precision finishing | TF | SNMG120404-TF | 0.4 | | | | | | | | | | | ● | | | | | | | | | | | | | | | | | | | | |
| |  | SNMG120408-TF | 0.8 | | | | | | | | | | | ● | | | | | | | | | | | | | | | | | | | | |
| | 01 | SNGG090302-01 | 0.2 | | | | | | | | | | | ● | ● | | | | | | | | | | | | | | | | | | | | |
| | | SNGG090304-01 | 0.4 | | | | | | | | | | | ● | | | | | | | | | | | | | | | | | | | | |
| |  | SNGG090308-01 | 0.8 | | | | | | | | | | | ● | ● | | | | | | | | | | | | | | | | | | | | |
| | | SNGG120402-01 | 0.2 | | | | | | | | | | | ● | | | | | | | | | | | | | | | | | | | | |
| | | SNGG120404-01 | 0.4 | | | | | | | | | | | ● | | | | | | | | | | | | | | | | | | | | |
| | | SNGG120408-01 | 0.8 | | | | | | | | | | | ● | ● | | | | | | | | | | | | | | | | | | | | |
| | B ~ D | SNGG090304R-B | 0.4 | | | | | | ● | | | | | ● | | ● | | | | | | | | | | | | | | | | | | |
| | | SNGG090304L-B | 0.4 | | | | | | ● | | | | | ● | | ● | | | | | | | | | | | | | | | | | | |
| | | SNGG090308R-B | 0.8 | | | | | | | | | | | ● | | ● | | | | | | | | | | | | | | | | | | |
| | | SNGG090308L-B | 0.8 | | | | | | | | | | | ● | | ● | | | | | | | | | | | | | | | | | | |
| |  | SNGG120404R-C | 0.4 | | | | | | ● | | | | | ● | | | | | | | | | | | | | | | | | | | | |
| | | SNGG120404L-C | 0.4 | | | | | | ● | | | | | ● | | ● | | | | | | | | | | | | | | | | | | |
| | | SNGG120408R-C | 0.8 | | | | | | | | | | | ● | | | | | | | | | | | | | | | | | | | | |
| | | SNGG120408L-C | 0.8 | | | | | | | | | | | ● | | ● | | | | | | | | | | | | | | | | | | |
| | | SNGG120408R-D | 0.8 | | | | | | | | | | | ● | | | | | | | | | | | | | | | | | | | | |
| | | SNGG120408L-D | 0.8 | | | | | | | | | | | ● | | | | | | | | | | | | | | | | | | | | |
| Finishing | TSF | SNMG120404-TSF | 0.4 | ● | ● | | | | ● | | | | | ● | | | | | | | | | | | | | | | | | | | | |
| |  | SNMG120408-TSF | 0.8 | ● | ● | | | | ● | | | | | ● | | | | | | | | | | | | | | | | | | | | |
| | | SNMG120412-TSF | 1.2 | ● | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

● : Line-up

External toolholders → **B209 -** Internal toolholders → **B293 -**

● : Continuous cutting
ⓒ : Light interrupted cutting
✣ : Heavy interrupted cutting

## NEGATIVE TYPE



**Square, 90° with hole**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ⓒ | ✣ | ⓒ✣ | | | | | | | | ●ⓒ | | | | ● | | | | | | | | | | | | | |
| M | Stainless | ● | ⓒ | ⓒ | | | ● | ⓒ | | | | | | | | ● | | | | | | | | | | | | | |
| K | Cast iron | | | | ● | ⓒ | | | | | | ●ⓒ | | | | ● | | | | | | | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | ● | | | | | | | | | | | | | |
| S | Superalloys | | | | | | ● | ⓒ | | | | | | | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | | | | Cermet | | | Uncoated | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T6120 | T6130 | AH630 | T5105 | T5115 | AH8005 | AH8015 | | NS9530 | | | TH10 | | | | | | | | | | | | | | |
| Finishing | 11 | SNMG120404-11 | 0.4 | | | | | | | | | ● | | | | | | | | | | | | | | | | | |
| | | SNMG120408-11 | 0.8 | | | | | | | | | ● | | | ● | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Finishing of mild steels | 17 | SNMG120408-17 | 0.8 | | | | | | | | | ● | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Finishing | SF | SNMG120404-SF | 0.4 | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | | |
| | | SNMG120408-SF | 0.8 | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | CF | SNMG120408-CF | 0.8 | | | | ● | ● | | | | | | | | | | | | | | | | | | | | | |
| | | SNMG120412-CF | 1.2 | | | | ● | ● | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | HRF | SNMG120408-HRF | 0.8 | | | | | | ● | ● | | | | | | | | | | | | | | | | | | | |
| | | SNMG120412-HRF | 1.2 | | | | | | ● | ● | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

● : Line-up

External toolholders → **B209 -** Internal toolholders → **B293 -**

# TurnLine - Insert

● : Continuous cutting
ɔ : Light interrupted cutting
✣ : Heavy interrupted cutting

## NEGATIVE TYPE



**Square, 90° with hole**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ● | ●ɔ | ɔ✣ | ✣ | ɔ | ✣ | ɔ✣ | ✣ | ●ɔ | ●ɔ | | | | ●ɔ | | | | ●ɔ | | | | | | | | | | |
| M | Stainless | | | | | ● | ɔ | ɔ | ✣ | ●ɔ | ●ɔ | | | | | | | | | | | | | | | | | | |
| K | Cast iron | ●ɔ | ●ɔ | | | | | | | ●ɔ | ●ɔ | | | | ●ɔ | | | | ●ɔ | | | | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S | Superalloys | | | | | | | | | ●ɔ | | | | | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | | | | | | Coated cermet | | | | Cermet | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9105 | T9115 | T9125 | T9135 | T6120 | T6130 | AH630 | AH645 | AH120 | GH330 | GT9530 | | | | NS9530 | | | | |
| Finishing | TS | SNMG120404-TS | 0.4 | | ● | ● | | | | | | | | ● | | | | ● | | | | |
| |  | SNMG120408-TS | 0.8 | ● | ● | ● | ● | | | | | | | ● | | | | ● | | | | |
| | | SNMG120412-TS | 1.2 | | ● | ● | ● | | | | | | | | | | | | | | | |
| High feed, small depth of cutting | AS | SNMG120404-AS | 0.4 | | | | | | | | | | | | | | | ● | | | | |
| |  | SNMG120408-AS | 0.8 | ● | ● | | | | | | | | | | | | | ● | | | | |
| Finishing | NS | SNMG120408-NS | 0.8 | | ● | ● | | | | | | | | | | | | | | | | |
| |  | | | | | | | | | | | | | | | | | | | | | |
| | SS | SNMG120404-SS | 0.4 | | | | | ● | ● | ● | ● | | ● | | | | | | | | | |
| |  | SNMG120408-SS | 0.8 | | | | | ● | ● | ● | ● | | ● | | | | | | | | | |
| | | SNMG120412-SS | 1.2 | | | | | ● | ● | ● | ● | | | | | | | | | | | |
| Medium cutting | TM | SNMG090304-TM | 0.4 | | ● | ● | ● | | | | | | | | | | | | | | | |
| |  | SNMG090308-TM | 0.8 | | ● | ● | ● | | | | | | | | | | | | | | | |
| | | SNMG120404-TM | 0.4 | | ● | ● | | | | | | ● | | | | | | | | | | |
| | | SNMG120408-TM | 0.8 | ● | ● | ● | ● | | | | | ● | | | | | | | | | | |
| | | SNMG120412-TM | 1.2 | ● | ● | ● | ● | | | | | ● | | | | | | | | | | |
| | | SNMG120416-TM | 1.6 | | ● | ● | ● | | | | | | | | | | | | | | | |
| | | SNMG150608-TM | 0.8 | | ● | | | | | | | | | | | | | | | | | |
| | | SNMG150612-TM | 1.2 | | ● | | | | | | | ● | | | | | | | | | | |
| | | SNMG190608-TM | 0.8 | | ● | | | | | | | | | | | | | | | | | |
| | | SNMG190612-TM | 1.2 | | ● | | | | | | | ● | | | | | | | | | | |

● : Line-up

External toolholders → **B209 -**  Internal toolholders → **B293 -**

● : Continuous cutting
◐ : Light interrupted cutting
✣ : Heavy interrupted cutting

## NEGATIVE TYPE



**Square, 90° with hole**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ● | ●◐ | ◐✣ | ✣ | ✣ | | | | | | ● | ●◐ | | | ●◐ | | | | ●◐ | ●◐ | | | ● | | | | | | | |
| M | Stainless | | | | | ◐ | | | | | | ● | ●◐ | | | | | | | | | | | ● | | | | | | | |
| K | Cast iron | ●◐ | ●◐ | | | | ●◐ | ● | ◐ | ✣ | | ● | ●◐ | | | ●◐ | | | | ●◐ | ●◐ | | | ● | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | | | | | | ● | | | | | | | |
| S | Superalloys | | | | | | | | | | | ● | ●◐ | | | | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | | | | | | | | Coated cermet | | | | Cermet | | | | Uncoated | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9105 | T9115 | T9125 | T9135 | T6130 | T515 | T5105 | T5115 | T5125 | AH110 | AH120 | | GT720 | | | | NS9530 | NS520 | | | TH10 | | | | | | | |
| Finishing to medium cutting | ZM | SNMG120408-ZM | 0.8 | | ● | ● | ● | | | | | | | | | | | | | | | | | ● | | | | | | | |
| |  | SNMG120412-ZM | 1.2 | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | | | |
| Medium cutting | DM | SNMG120408-DM | 0.8 | | ● | ● | | | | | | | | | | | | | | | | | | | | | | | | | |
| |  | SNMG120412-DM | 1.2 | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | | | |
| | All-round | SNMG090304 | 0.4 | | ● | ● | | | | | | | | | | | | | | | ● | | | ● | | | | | | | |
| | | SNMG090308 | 0.8 | | ● | ● | ● | | | | | | | | | | | | | | ● | | | ● | | | | | | | |
| | | SNMG120404 | 0.4 | | ● | ● | ● | | | ● | ● | ● | ● | ● | | | | | | | ● | ● | | ● | | | | | | | |
| | | SNMG120408 | 0.8 | ● | ● | ● | ● | | ● | ● | ● | ● | ● | ● | | ● | | | | | ● | ● | | ● | | | | | | | |
| | | SNMG120412 | 1.2 | ● | ● | ● | ● | | ● | ● | ● | ● | ● | ● | | | | | | | | | | ● | | | | | | | |
| |  | SNMG120416 | 1.6 | ● | ● | ● | ● | | | ● | ● | ● | | | | | | | | | | | | | | | | | | | |
| | | SNMG120420 | 2.0 | | ● | ● | ● | | | ● | ● | ● | | | | | | | | | | | | | | | | | | | |
| | | SNMG150612 | 1.2 | | ● | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | SNMG150616 | 1.6 | | ● | ● | | | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | SNMG190612 | 1.2 | | ● | ● | ● | ● | ● | ● | ● | ● | | ● | | | | | | | | | | | | | | | | | |
| | | SNMG190616 | 1.6 | | ● | ● | ● | | ● | ● | ● | ● | | ● | | | | | | | | | | | | | | | | | |
| | | SNMG250724 | 2.4 | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | | | |
| Finishing to medium cutting | 27 | SNMG120408-27 | 0.8 | | | ● | | | | | | | | | | | | | | | ● | | | | | | | | | | |
| |  | SNMG120412-27 | 1.2 | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | |

● : Line-up

External toolholders → **B209 -** Internal toolholders → **B293 -**

● : Continuous cutting
◐ : Light interrupted cutting
✣ : Heavy interrupted cutting

## NEGATIVE TYPE



**Square, 90° with hole**

| | | |
|---|---|---|
| P | Steel | ●◐ ◐ ✣ ◐✣ ✣ |
| M | Stainless | ● ◐ ◐ ✣ |
| K | Cast iron | ●◐ ● ◐ ✣ |
| N | Non-ferrous | ● |
| S | Superalloys | ● ● ◐ ● |
| H | Hard materials | |

| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | | | | | | | | Cermet | | | | Uncoated | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9115 | T6120 | T6130 | AH630 | AH645 | T5105 | T5115 | T5125 | AH725 | AH8005 | AH8015 | GH110 | GH330 | NS9530 | | | | TH10 | | | | |
| Medium cutting | 37 | SNMG120408-37 | 0.8 | ● | | | | | | | | | | | | ● | ● | | | | | | | |
| | SM | SNMG120408-SM | 0.8 | | ● | ● | ● | ● | | | | ● | | | | | | | | | | | | |
| | | SNMG120412-SM | 1.2 | | ● | ● | ● | ● | | | | | | | | | | | | | | | | |
| | CM | SNMG120408-CM | 0.8 | | | | | | ● | ● | ● | | | | | | | | | | | | | |
| | | SNMG120412-CM | 1.2 | | | | | | ● | ● | ● | | | | | | | | | | | | | |
| | P | SNGG090304R-P | 0.4 | | | | | | | | | | | | ● | | | | | | ● | | | |
| | | SNGG090304L-P | 0.4 | | | | | | | | | | | | ● | | | | | | ● | | | |
| | | SNGG090308R-P | 0.8 | | | | | | | | | | | | ● | ● | | | | | ● | | | |
| | | SNGG090308L-P | 0.8 | | | | | | | | | | | | | | | | | | ● | | | |
| | | SNGG120404R-P | 0.4 | | | | | | | | | | | | ● | | | | | | ● | | | |
| | | SNGG120404L-P | 0.4 | | | | | | | | | | | | ● | | | | | | ● | | | |
| | | SNGG120408R-P | 0.8 | | | | | | | | | | | | ● | | | | | | ● | | | |
| | | SNGG120408L-P | 0.8 | | | | | | | | | | | | ● | | | | | | ● | | | |
| Finishing to medium cutting | HRM | SNMG120408-HRM | 0.8 | | | | | | | | | | ● | ● | | | | | | | | | | |
| | | SNMG120412-HRM | 1.2 | | | | | | | | | | ● | ● | | | | | | | | | | |
| | | SNMG150608-HRM | 0.8 | | | | | | | | | | ● | ● | | | | | | | | | | |
| | | SNMG150612-HRM | 1.2 | | | | | | | | | | ● | ● | | | | | | | | | | |
| | | SNMG190612-HRM | 1.2 | | | | | | | | | | ● | ● | | | | | | | | | | |
| | | SNMG190616-HRM | 1.6 | | | | | | | | | | ● | ● | | | | | | | | | | |

● : Line-up

External toolholders → B209 - Internal toolholders → B293 -

● : Continuous cutting
◐ : Light interrupted cutting
✣ : Heavy interrupted cutting

## NEGATIVE TYPE



**Square, 90° with hole**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ● | ●◐ | ◐✣ | ✣ | ◐ | ✣ | ◐✣ | ✣ | ●◐ | | ●◐ | | | ●◐ | | | | | | | | | | | | | | | | |
| M | Stainless | | | | | ● | ◐ | ◐ | ✣ | ●◐ | | ●◐ | | | | | | | | | | | | | | | | | | | |
| K | Cast iron | ●◐ | ●◐ | | | | | | | ●◐ | | ●◐ | | | ●◐ | | | | | ◐✣ | | | | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | | ◐✣ | | | | | | | | | | |
| S | Superalloys | | | | | | | | | ●◐ | ◐ | | | | | | | | | ◐✣ | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | | | | | | | | Cermet | | | | Uncoated | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9105 | T9115 | T9125 | T9135 | T6120 | T6130 | AH630 | AH645 | AH120 | AH905 | GH330 | | NS9530 | | | | KS20 | | | | | | | | | | |
| Medium cutting | **HMM** | **SNMG120408-HMM** | 0.8 | | | | | | | | | | ● | | | | | | | | | | | | | | | | | |
| | | **SNMG120412-HMM** | 1.2 | | | | | | | | | | ● | | | | | | | | | | | | | | | | | |
| | **SA** | **SNMG120404-SA** | 0.4 | | | | | ● | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | |
| | | **SNMG120408-SA** | 0.8 | | | | | ● | ● | ● | ● | ● | | | | | | | | ● | | | | | | | | | | |
| | | **SNMG120412-SA** | 1.2 | | | | | ● | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | |
| | | **SNMG190612-SA** | 1.2 | | | | | | | | | | | | | | | | | ● | | | | | | | | | | |
| | **S** | **SNMG120404R-S** | 0.4 | | | ● | ● | | ● | ● | ● | | | | | | ● | | | | | | | | | | | | | |
| | | **SNMG120404L-S** | 0.4 | | | ● | ● | | ● | ● | ● | | | | | | ● | | | | | | | | | | | | | |
| | | **SNMG120408R-S** | 0.8 | | | ● | ● | | ● | ● | ● | | | ● | | | ● | | | | | | | | | | | | | |
| | | **SNMG120408L-S** | 0.8 | | | ● | ● | | ● | ● | ● | | | ● | | | ● | | | | | | | | | | | | | |
| Medium to heavy cutting | **TH** | **SNMG120408-TH** | 0.8 | | ● | ● | ● | | | | | ● | | | | | | | | | | | | | | | | | | |
| | | **SNMG120412-TH** | 1.2 | | ● | ● | ● | | | | | ● | | | | | | | | | | | | | | | | | | |
| | | **SNMG150612-TH** | 1.2 | ● | ● | ● | | | | | | ● | | | | | | | | | | | | | | | | | | |
| | | **SNMG150616-TH** | 1.6 | ● | ● | ● | | | | | | ● | | | | | | | | | | | | | | | | | | |
| | | **SNMG190612-TH** | 1.2 | ● | ● | ● | ● | | | | | ● | | | | | | | | | | | | | | | | | | |
| | | **SNMG190616-TH** | 1.6 | ● | ● | ● | ● | | | | | ● | | | | | | | | | | | | | | | | | | |
| | **THS** | **SNMG120408-THS** | 0.8 | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | | |
| | | **SNMG120412-THS** | 1.2 | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | | |
| | | **SNMG150612-THS** | 1.2 | | ● | ● | | | | | | | | | | | | | | | | | | | | | | | | |
| | | **SNMG150616-THS** | 1.6 | | ● | ● | | | | | | | | | | | | | | | | | | | | | | | | |
| | | **SNMG190608-THS** | 0.8 | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | | |
| | | **SNMG190612-THS** | 1.2 | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | | |
| | | **SNMG190616-THS** | 1.6 | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | | |
| | | **SNMG190624-THS** | 2.4 | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | | |
| | | **SNMG250716-THS** | 1.6 | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | | |
| | | **SNMG250724-THS** | 2.4 | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | | |

● : Line-up

External toolholders → **B209 -** Internal toolholders → **B293 -**

● : Continuous cutting
◐ : Light interrupted cutting
✣ : Heavy interrupted cutting

## NEGATIVE TYPE



**Square, 90° with hole**

| | | |
|---|---|---|
| P | Steel | ●◐ ◐✣ ✣ ✣ ◐✣ ✣ |
| M | Stainless | ◐ ◐ ✣ |
| K | Cast iron | ●◐ ● ◐ ✣ |
| N | Non-ferrous | |
| S | Superalloys | |
| H | Hard materials | |

| Application | Chipbreaker | Designation | Corner radius | Coating: T9115 | T9125 | T9135 | T6130 | AH630 | AH645 | T5105 | T5115 | T5125 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Medium to heavy cutting (Single sided) | TRS | SNMM150612-TRS | 1.2 | ● | ● | ● | | | | | | |
| | | SNMM150616-TRS | 1.6 | ● | ● | ● | | | | | | |
| |  | SNMM190616-TRS | 1.6 | ● | ● | ● | | | | | | |
| | | SNMM190624-TRS | 2.4 | ● | ● | ● | | | | | | |
| | | SNMM250924-TRS | 2.4 | ● | ● | ● | | | | | | |
| | TU | SNMM190616-TU | 1.6 | | | ● | | | | | | |
| | | SNMM190624-TU | 2.4 | | ● | ● | | | | | | |
| |  | SNMM250724-TU | 2.4 | | ● | ● | | | | | | |
| | | SNMM250924-TU | 2.4 | ● | ● | | | | | | | |
| | TUS | SNMM190612-TUS | 1.2 | ● | ● | ● | | | | | | |
| | | SNMM190616-TUS | 1.6 | ● | ● | ● | | | | | | |
| | | SNMM190624-TUS | 2.4 | ● | ● | ● | | | | | | |
| |  | SNMM250724-TUS | 2.4 | ● | ● | ● | | | | | | |
| | | SNMM250732-TUS | 3.2 | ● | ● | | | | | | | |
| | | SNMM250924-TUS | 2.4 | ● | ● | ● | | | | | | |
| | | SNMM250932-TUS | 3.2 | ● | ● | | | | | | | |
| Medium to heavy cutting | SH | SNMG120408-SH | 0.8 | | | | ● | ● | ● | | | |
| | | SNMG120412-SH | 1.2 | | | | ● | ● | ● | | | |
| |  | SNMG150612-SH | 1.2 | | | | ● | ● | ● | | | |
| | | SNMG150616-SH | 1.6 | | | | ● | ● | ● | | | |
| | | SNMG190612-SH | 1.2 | | | | ● | ● | ● | | | |
| | | SNMG190616-SH | 1.6 | | | | ● | ● | ● | | | |
| | CH | SNMG120408-CH | 0.8 | | | | | | | ● | ● | ● |
| | | SNMG120412-CH | 1.2 | | | | | | | ● | ● | ● |
| |  | SNMG120416-CH | 1.6 | | | | | | | ● | ● | ● |

● : Line-up

External toolholders → B209 - Internal toolholders → B293 -

● : Continuous cutting
ⓒ : Light interrupted cutting
✣ : Heavy interrupted cutting

## NEGATIVE TYPE



**Square, 90° with hole**

| | | Coating | | | | | | | | Coated cermet | | | | Cermet | | | | Uncoated | | | | Ceramics | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | T515 | T5105 | T5115 | T5125 | | | | | GT720 | | | | NS520 | | | | TH10 | | | | FX105 | LX21 | LX11 | | | | | |
| P | Steel | | | | | | | | | ●ⓒ | | | | ●ⓒ | | | | ● | | | | | | | | | | | |
| M | Stainless | | | | | | | | | | | | | | | | | ● | | | | | | | | | | | |
| K | Cast iron | ●ⓒ | ● | ⓒ | ✣ | | | | | ●ⓒ | | | | ●ⓒ | | | | ● | | | | ●ⓒ | ● | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | ● | | | | | | | | | | | |
| S | Superalloys | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | ● | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T515 | T5105 | T5115 | T5125 | GT720 | NS520 | TH10 | FX105 | LX21 | LX11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Finishing to medium cutting | - | SNMA090308 | 0.8 | | ● | | | | | ● | | | |
| | | SNMA120404 | 0.4 | | ● | ● | ● | ● | | | | | |
| | | SNMA120408 | 0.8 | ● | ● | ● | ● | | ● | ● | ● | | |
| | | SNMA120412 | 1.2 | ● | ● | ● | ● | | ● | ● | ● | | |
| | | SNMA120416 | 1.6 | | ● | ● | ● | | | | | | |
| | - | SNGA090304 | 0.4 | | | | | | | ● | | | |
| | | SNGA120404 | 0.4 | | | | | ● | | ● | | | ● |
| | | SNGA120408 | 0.8 | | | | | | ● | ● | ● | | ● |
| | | SNGA120412 | 1.2 | | | | | | | ● | ● | ● | ● |
| | | SNGA120416 | 1.6 | | | | | | | | ● | | ● |

● : Line-up

External toolholders → **B209 -** Internal toolholders → **B293 -**

# TurnLine - Insert

## NEGATIVE TYPE



**Square, 90° without hole**

| | | |

● : Continuous cutting
ɔ : Light interrupted cutting
✣ : Heavy interrupted cutting

## NEGATIVE TYPE



**Triangular, 60° with hole**

| | | |

# TurnLine - Insert

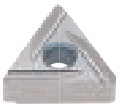
● : Continuous cutting
ᑕ : Light interrupted cutting
✣ : Heavy interrupted cutting

## NEGATIVE TYPE



**Triangular, 60° with hole**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ● | ●ᑕ | ᑕ✣ | ✣ | ●ᑕ | ●ᑕ | | | | ●ᑕ | | | | ●ᑕ | ● | | | ● | | | | | | | | | | | | |
| M | Stainless | | | | | ●ᑕ | ●ᑕ | | | | | | | | | | | | ● | | | | | | | | | | | | |
| K | Cast iron | ●ᑕ | ●ᑕ | | | ●ᑕ | | | | | ●ᑕ | | | | ●ᑕ | | | | ● | | | | | | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | ● | | | | | | | | | | | | |
| S | Superalloys | | | | | ●ᑕ | | | | | | | | | | | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | | Coated cermet | | | Cermet | | | Uncoated | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9105 | T9115 | T9125 | T9135 | AH120 | SH725 | GT9530 | | | NS9530 | X407 | | TH10 | | | | | | | | | | | | | | | |
| Precision finishing | D | TNGG220404R-D | 0.4 | | | | | | | | | | ● | ● | | | | | | | | | | | | | | | | | |
| |  | TNGG220404L-D | 0.4 | | | | | | | | | | ● | | | | | | | | | | | | | | | | | | |
| | | TNGG220408R-D | 0.8 | | | | | | | | | | ● | ● | | | | | | | | | | | | | | | | | |
| | | TNGG220408L-D | 0.8 | | | | | | | | | | ● | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | W | TNGG160404R-W | 0.4 | | | | | | | | | | ● | | | ● | | | | | | | | | | | | | | | |
| |  | TNGG160404L-W | 0.4 | | | | | | | | | | ● | | | ● | | | | | | | | | | | | | | | |
| | | TNGG160408R-W | 0.8 | | | | | | | | | | ● | | | | | | | | | | | | | | | | | | |
| | | TNGG160408L-W | 0.8 | | | | | | | | | | ● | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Precision finishing (Sharp edgeds) | W | TNGG160402FR-W | 0.2 | | | | | | ● | | | | | | | | | | | | | | | | | | | | | | |
| |  | TNGG160402FL-W | 0.2 | | | | | | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | TNGG160404FR-W | 0.4 | | | | | | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | TNGG160404FL-W | 0.4 | | | | | | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | TNGG160408FR-W | 0.8 | | | | | | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | TNGG160408FL-W | 0.8 | | | | | | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Finishing | TSF | TNMG110404E-TSF | 0.4 | | ● | ● | | | | | ● | | | ● | | | | | | | | | | | | | | | | | |
| |  | TNMG110408E-TSF | 0.8 | | ● | ● | | | | | ● | | | ● | | | | | | | | | | | | | | | | | |
| | | TNMG160402-TSF | 0.2 | | | | | ● | | | ● | | | ● | | | | | | | | | | | | | | | | | |
| | | TNMG160404-TSF | 0.4 | | ● | ● | ● | ● | | | ● | | | ● | | | | | | | | | | | | | | | | | |
| | | TNMG160408-TSF | 0.8 | ● | ● | ● | ● | ● | | | ● | | | ● | | | | | | | | | | | | | | | | | |
| | | TNMG160412-TSF | 1.2 | | ● | ● | ● | | | | ● | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Finishing (Wiper) | FW | TNMG110404E-FW | 0.4 | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | |
| |  | TNMG110408E-FW | 0.8 | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | TNMG160404-FW | 0.4 | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | TNMG160408-FW | 0.8 | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Finishing | ZF | TNMG160404-ZF | 0.4 | | ● | ● | ● | | | | ● | | | ● | | | | | | | | | | | | | | | | | |
| |  | TNMG160408-ZF | 0.8 | | ● | ● | ● | | | | ● | | | ● | | | | | | | | | | | | | | | | | |
| | | TNMG160412-ZF | 1.2 | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

● : Line-up

External toolholders → B203 -
J series toolholders → B343, B344
Internal toolholders → B276 -
Cartridges → F152 -

● : Continuous cutting
◐ : Light interrupted cutting
✣ : Heavy interrupted cutting

## NEGATIVE TYPE



**Triangular, 60° with hole**

| | | Coating | | | | | | | | | | | | Cermet | | | | Uncoated | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | T9125 | T6120 | T6130 | AH630 | T5105 | T5115 | AH8005 | AH8015 | GH330 | | | | NS9530 | | | | TH10 | | | | | | | | | | |
| P | Steel | ◐✣ | ◐ | ✣ | ◐✣ | | | | | ●◐ | | | | ●◐ | | | | ● | | | | | | | | | | |
| M | Stainless | | ● | ◐ | ◐ | | | ● | ◐ | ●◐ | | | | | | | | ● | | | | | | | | | | |
| K | Cast iron | | | | | ● | ◐ | | | ●◐ | | | | ●◐ | | | | ● | | | | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | ● | | | | | | | | | | |
| S | Superalloys | | | | | | | ● | ◐ | | | | | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9125 | T6120 | T6130 | AH630 | T5105 | T5115 | AH8005 | AH8015 | GH330 | | | | NS9530 | | | | TH10 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Finishing | **11** | **TNMG110304-11** | 0.4 | | | | | | | | | | | | | ● | | | | | | | | | | | | | | |
| | | **TNMG110308-11** | 0.8 | | | | | | | | | | | | | ● | | | | | | | | | | | | | | |
| | | **TNMG160402-11** | 0.2 | | | | | | | | | | | | | ● | | | | | | | | | | | | | | |
| | | **TNMG160404-11** | 0.4 | | | | | | | | | ● | | | | ● | | | | ● | | | | | | | | | | |
| | | **TNMG160408-11** | 0.8 | | | | | | | | | | | | | ● | | | | | | | | | | | | | | |
| | | **TNMG220404-11** | 0.4 | | | | | | | | | | | | | ● | | | | | | | | | | | | | | |
| | | **TNMG220408-11** | 0.8 | | | | | | | | | | | | | ● | | | | | | | | | | | | | | |
| Finishing of mild steels | **17** | **TNMG160404-17** | 0.4 | ● | | | | | | | | ● | | | | ● | | | | | | | | | | | | | | |
| | | **TNMG160408-17** | 0.8 | ● | | | | | | | | | | | | ● | | | | | | | | | | | | | | |
| Finishing | **SF** | **TNMG160404-SF** | 0.4 | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | | |
| | | **TNMG160408-SF** | 0.8 | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | | |
| | | **TNMG160412-SF** | 1.2 | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | | |
| | **CF** | **TNMG160404-CF** | 0.4 | | | | | ● | ● | | | | | | | | | | | | | | | | | | | | | |
| | | **TNMG160408-CF** | 0.8 | | | | | ● | ● | | | | | | | | | | | | | | | | | | | | | |
| | **HRF** | **TNMG160404-HRF** | 0.4 | | | | | | | ● | ● | | | | | | | | | | | | | | | | | | | |
| | | **TNMG160408-HRF** | 0.8 | | | | | | | ● | ● | | | | | | | | | | | | | | | | | | | |

● : Line-up

External toolholders → **B208 -**
J series toolholders → **B343, B344**
Internal toolholders → **B294 -**
Cartridges → **F152 -**

# TurnLine - Insert

## NEGATIVE TYPE



**Triangular, 60° with hole**

| | | |

● : Continuous cutting
◐ : Light interrupted cutting
✣ : Heavy interrupted cutting

## NEGATIVE TYPE



**Triangular, 60° with hole**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ● | ●◐ | ◐✣ | ✣ | ◐ | ✣ | ◐✣ | ✣ | ●◐ | ◐ | ●◐ | | | ●◐ | | | | ●◐ | | | | | | | | | | |
| M | Stainless | | | | | ● | ◐ | ◐ | ✣ | ●◐ | ◐ | ●◐ | | | | | | | | | | | | | | | | | |
| K | Cast iron | ●◐ | ●◐ | | | | | | | ●◐ | ◐ | ●◐ | | | ●◐ | | | | ●◐ | | | | | | | ◐✣ | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | | | | | | | | ◐✣ | | | |
| S | Superalloys | | | | | | | | | ●◐ | ● | | | | | | | | | | | | | | | ◐✣ | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | | | | | | | Coated cermet | | | | Cermet | | | | Uncoated | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9105 | T9115 | T9125 | T9135 | T6120 | T6130 | AH630 | AH645 | AH120 | AH725 | GH330 | GT9530 | | | | NS9530 | | | | KS20 | | | | | |
| Finishing | SS | TNMG110404E-SS | 0.4 | | | | | | | ● | ● | | | | | | | | | | | | | | | | | |
| | | TNMG110408E-SS | 0.8 | | | | | | | ● | ● | | | | | | | | | | | | | | | | | |
| | | TNMG160404-SS | 0.4 | | | | | ● | ● | ● | ● | | | ● | | | | | | | | | ● | | | | | |
| | | TNMG160408-SS | 0.8 | | | | | ● | ● | ● | ● | | | ● | | | | | | | | | ● | | | | | |
| | | TNMG160412-SS | 1.2 | | | | | ● | ● | ● | ● | | | ● | | | | | | | | | | | | | | |
| | | TNMG220404-SS | 0.4 | | | | | ● | ● | ● | ● | | | ● | | | | | | | | | | | | | | |
| | | TNMG220408-SS | 0.8 | | | | | ● | ● | ● | ● | | | ● | | | | | | | | | | | | | | |
| | | TNMG220412-SS | 1.2 | | | | | ● | ● | ● | ● | | | | | | | | | | | | | | | | | |
| Medium cutting | TM | TNMG110304-TM | 0.4 | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | |
| | | TNMG110308-TM | 0.8 | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | |
| | | TNMG110404E-TM | 0.4 | | ● | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | TNMG110408E-TM | 0.8 | | ● | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | TNMG110412E-TM | 1.2 | | ● | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | TNMG160404-TM | 0.4 | | ● | ● | ● | | | | | ● | ● | | | | | | | | | | | | | | | |
| | | TNMG160408-TM | 0.8 | ● | ● | ● | ● | | | | | ● | ● | | | | | | | | | | | | | | | |
| | | TNMG160412-TM | 1.2 | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | |
| | | TNMG220404-TM | 0.4 | | | | | | | | | ● | | | | | | | | | | | | | | | | |
| | | TNMG220408-TM | 0.8 | ● | ● | ● | ● | | | | | ● | | | | | | | | | | | | | | | | |
| | | TNMG220412-TM | 1.2 | | ● | ● | ● | | | | | ● | | | | | | | | | | | | | | | | |
| | | TNMG220416-TM | 1.6 | | ● | ● | | | | | | | | | | | | | | | | | | | | | | |
| Finishing to medium cutting | AM | TNMG160408-AM | 0.8 | | ● | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | TNMG160412-AM | 1.2 | | ● | ● | | | | | | | | | | | | | | | | | | | | | | |
| | NM | TNMG160408-NM | 0.8 | | | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | TNMG160412-NM | 1.2 | | ● | ● | | | | | | | | | | | | | | | | | | | | | | |
| | TQ | TNMG160404-TQ | 0.4 | | | | | | | | | | | | ● | | | | ● | | | | | | | | | |
| | | TNMG160408-TQ | 0.8 | | | | | | | | | | | | ● | | | | ● | | | | | | | | | |

● : Line-up

External toolholders → **B203 -**
J series toolholders → **B343, B344**
Internal toolholders → **B276 -**
Cartridges → **F152 -**

# TurnLine - Insert

● : Continuous cutting
ɔ : Light interrupted cutting
✣ : Heavy interrupted cutting

## NEGATIVE TYPE



**Triangular, 60° with hole**

| | | |
|---|---|---|
| P | Steel | ● ●ɔ ɔ✣ ✣ ɔ✣ ● ● ● ● ●ɔ ● ●ɔ ● ● ● ●

● : Continuous cutting
ᑕ : Light interrupted cutting
✣ : Heavy interrupted cutting

## NEGATIVE TYPE



**Triangular, 60° with hole**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ●ᑕ | ᑕ✣ | ✣ | ᑕ | ✣ | ᑕ✣ | ✣ | | | | | ●ᑕ | ᑕ | ●ᑕ | ●ᑕ | | | | ●ᑕ | | | | ● | | |
| M | Stainless | | | | ● | ᑕ | ᑕ | ✣ | | | | | ●ᑕ | ᑕ | ●ᑕ | | | | | | | | | ● | | |
| K | Cast iron | ●ᑕ | | | | | | | ●ᑕ | ● | ᑕ | ✣ | ●ᑕ | ᑕ | ●ᑕ | ●ᑕ | | | | ●ᑕ | | | | ● | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | | | | | | ● | | |
| S | Superalloys | | | | | | | | | | | | ●ᑕ | ● | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | | | | | | | | | | Coated cermet | | | | Cermet | | | | Uncoated | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9115 | T9125 | T9135 | T6120 | T6130 | AH630 | AH645 | T515 | T5105 | T5115 | T5125 | AH120 | AH725 | GH330 | GT720 | | | | NS9530 | | | | TH10 | | | |
| Medium cutting | **28** | **TNMG160404-28** | 0.4 | | | | | | | | | | | | ● | | | | | | | | | | | | | | |
| |  | **TNMG160408-28** | 0.8 | | | | | | | | | | | | ● | | | | | | | | | | | | | | |
| | | **TNMG220404-28** | 0.4 | | | | | | | | | | | | ● | | | | | | | | | | | | | | |
| | | **TNMG220408-28** | 0.8 | | | | | | | | | | | | ● | | | | | | | | | | | | | | |
| | **33** | **TNMG160404-33** | 0.4 | | | | | | | | | | | | | | | | | | | | | | | ● | | | |
| | | **TNMG160408-33** | 0.8 | | | | | | | | | | | | | | | | | | | | | | | ● | | | |
| |  | **TNMG160416-33** | 1.6 | | ● | | | | | | | | | | | | | | | | | | | | | | | | |
| | | **TNMG220404-33** | 0.4 | | ● | | | | | | | | | | | | | ● | | | | | | | | | | | |
| | | **TNMG220412-33** | 1.2 | | | ● | | | | | | | | | | | | | | | | | | | | | | | |
| | | **TNMG220416-33** | 1.6 | | ● | | | | | | | | | | | | | | | | | | | | | | | | |
| | **37** | **TNMG160404-37** | 0.4 | ● | | | | | | | | | | | | | ● | | | | | ● | | | | | | | |
| | | **TNMG160408-37** | 0.8 | ● | | | | | | | | | | | | | ● | | | | | ● | | | | | | | |
| |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | **38** | **TNMG160404-38** | 0.4 | | | | | | | | | | | | | | ● | | | | | | | | | | | | |
| | | **TNMG160408-38** | 0.8 | | | | | | | | | | | | | | ● | | | | | | | | | | | | |
| |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | **SM** | **TNMG110404E-SM** | 0.4 | | | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | |
| | | **TNMG110408E-SM** | 0.8 | | | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | |
| | | **TNMG160404-SM** | 0.4 | | | | ● | ● | ● | ● | | | | | | ● | | | | | | | | | | | | | |
| | | **TNMG160408-SM** | 0.8 | | | | ● | ● | ● | ● | | | | | | ● | | | | | | | | | | | | | |
| |  | **TNMG160412-SM** | 1.2 | | | | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | | |
| | | **TNMG220408-SM** | 0.8 | | | | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | | |
| | | **TNMG220412-SM** | 1.2 | | | | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | | |
| | **CM** | **TNMG160404-CM** | 0.4 | | | | | | | | ● | ● | ● | ● | | | | | | | | | | | | | | | |
| | | **TNMG160408-CM** | 0.8 | | | | | | | | ● | ● | ● | ● | | | | | | | | | | | | | | | |
| |  | **TNMG160412-CM** | 1.2 | | | | | | | | ● | ● | ● | ● | | | | | | | | | | | | | | | |
| | | **TNMG220408-CM** | 0.8 | | | | | | | | | ● | ● | ● | | | | | | | | | | | | | | | |
| | | **TNMG220412-CM** | 1.2 | | | | | | | | | ● | ● | ● | | | | | | | | | | | | | | | |

● : Line-up

External toolholders → B203 -
J series toolholders → B343, B344
Internal toolholders → B276 -
Cartridges → F152 -

# TurnLine - Insert

● : Continuous cutting
◐ : Light interrupted cutting
✣ : Heavy interrupted cutting

## NEGATIVE TYPE



**Triangular, 60° with hole**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ◐ | ✣ | ●◐ | ✣ | ●◐ | | | | ● | ●◐ | ●◐ | | | | ●◐ | | | | | ● | | | | | | | | |
| M | Stainless | ● | ◐ | ◐ | ✣ | ●◐ | ● | ◐ | | ● | ●◐ | ●◐ | | | | | | | | | ● | | | | | | | | |
| K | Cast iron | | | | | ●◐ | | | | ● | ●◐ | | | | | ●◐ | | | | | ● | ◐✣ | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | | | ● | ◐✣ | | | | | | | |
| S | Superalloys | | | | | ●◐ | ● | ◐ | ◐ | ● | | | | | | | | | | | | ◐✣ | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | | | | | | | | | Cermet | | | | Uncoated | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T6120 | T6130 | AH630 | AH645 | AH120 | AH8005 | AH8015 | AH905 | GH110 | GH330 | SH725 | | | NS9530 | | | | TH10 | KS20 | | | | | | | |
| Medium cutting | P | TNGG160402R-P | 0.2 | | | | | | | | | ● | ● | | | | ● | | | | ● | | | | | | | | |
| | | TNGG160402L-P | 0.2 | | | | | | | | | ● | ● | | | | ● | | | | ● | | | | | | | | |
| | | TNGG160404R-P | 0.4 | | | | | | | | | ● | ● | | | | ● | | | | ● | | | | | | | | |
| | | TNGG160404L-P | 0.4 | | | | | | | | | ● | ● | | | | ● | | | | ● | | | | | | | | |
| | | TNGG160408R-P | 0.8 | | | | | | | | | ● | ● | | | | ● | | | | ● | | | | | | | | |
| | | TNGG160408L-P | 0.8 | | | | | | | | | ● | ● | | | | ● | | | | ● | | | | | | | | |
| Medium cutting (Sharp edge) | P | TNGG160402FR-P | 0.2 | | | | | | | | | | | ● | | | | | | | | | | | | | | | |
| | | TNGG160402FL-P | 0.2 | | | | | | | | | | | ● | | | | | | | | | | | | | | | |
| | | TNGG160404FR-P | 0.4 | | | | | | | | | | | ● | | | | | | | | | | | | | | | |
| | | TNGG160404FL-P | 0.4 | | | | | | | | | | | ● | | | | | | | | | | | | | | | |
| | | TNGG160408FR-P | 0.8 | | | | | | | | | | | ● | | | | | | | | | | | | | | | |
| | | TNGG160408FL-P | 0.8 | | | | | | | | | | | ● | | | | | | | | | | | | | | | |
| Finishing to medium cutting | HRM | TNMG160404-HRM | 0.4 | | | | | | ● | ● | | | | | | | | | | | | | | | | | | | |
| | | TNMG160408-HRM | 0.8 | | | | | | ● | ● | | | | | | | | | | | | | | | | | | | |
| | | TNMG160412-HRM | 1.2 | | | | | | ● | ● | | | | | | | | | | | | | | | | | | | |
| Medium cutting | HMM | TNMG160404-HMM | 0.4 | | | | | | | | ● | | | | | | | | | | | | | | | | | | |
| | | TNMG160408-HMM | 0.8 | | | | | | | | ● | | | | | | | | | | | | | | | | | | |
| | | TNMG160412-HMM | 1.2 | | | | | | | | ● | | | | | | | | | | | | | | | | | | |
| | SA | TNMG160404-SA | 0.4 | ● | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | |
| | | TNMG160408-SA | 0.8 | ● | ● | ● | ● | ● | | | | | | | | | | | | | | ● | | | | | | | |
| | | TNMG160412-SA | 1.2 | ● | ● | ● | ● | ● | | | | | | | | | | | | | | ● | | | | | | | |
| | | TNMG220408-SA | 0.8 | ● | ● | ● | ● | ● | | | | | | | | | | | | | | ● | | | | | | | |
| | | TNMG220412-SA | 1.2 | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | |

● : Line-up

External toolholders → B208 -
J series toolholders → B343, B344
Internal toolholders → B294 -
Cartridges → F152 -

● : Continuous cutting
ɔ : Light interrupted cutting
✣ : Heavy interrupted cutting

## NEGATIVE TYPE



**Triangular, 60° with hole**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ●ɔ | ɔ✣ | ✣ | ✣ | ɔ✣ | ✣ | | | | | ●ɔ | ɔ | ●ɔ | | | | ●ɔ | | | | | | | | | | | | | |
| M | Stainless | | | | ɔ | ɔ | ✣ | | | | | ●ɔ | ɔ | ●ɔ | | | | | | | | | | | | | | | | | |
| K | Cast iron | ●ɔ | | | | | | ●ɔ | ● | ɔ | ✣ | ●ɔ | ɔ | ●ɔ | | | | ●ɔ | | | | | | | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S | Superalloys | | | | | | | | | | | ●ɔ | ● | | | | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | | | | | | | | | | Cermet | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9115 | T9125 | T9135 | T6130 | AH630 | AH645 | T515 | T5105 | T5115 | T5125 | AH120 | AH725 | GH330 | | NS9530 | | | | | | | | | | | | | |
| Medium cutting | S | TNMG160404R-S | 0.4 | ● | ● | ● | ● | ● | ● | | | | | | ● | ● | | ● | | | | | | | | | | | | | |
| | | TNMG160404L-S | 0.4 | | ● | ● | ● | ● | ● | | | | | | | ● | | ● | | | | | | | | | | | | | |
| | | TNMG160408R-S | 0.8 | | ● | ● | ● | ● | ● | | | | | | ● | ● | | ● | | | | | | | | | | | | | |
| | | TNMG160408L-S | 0.8 | | ● | ● | ● | ● | ● | | | | | | | ● | | ● | | | | | | | | | | | | | |
| | | TNMG220404R-S | 0.4 | | ● | ● | ● | ● | ● | | | | | | | ● | | ● | | | | | | | | | | | | | |
| | | TNMG220404L-S | 0.4 | | ● | ● | ● | ● | ● | | | | | | | ● | | ● | | | | | | | | | | | | | |
| | | TNMG220408R-S | 0.8 | | ● | ● | ● | ● | ● | | | | | | | ● | | ● | | | | | | | | | | | | | |
| | | TNMG220408L-S | 0.8 | | ● | ● | ● | ● | ● | | | | | | | ● | | ● | | | | | | | | | | | | | |
| Medium to heavy cutting | TH | TNMG220408-TH | 0.8 | ● | ● | ● | | | | | | | | ● | | | | | | | | | | | | | | | | | |
| | | TNMG220412-TH | 1.2 | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | | | | |
| | THS | TNMG220408-THS | 0.8 | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | TNMG220412-THS | 1.2 | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | | | | |
| | CH | TNMG160404-CH | 0.4 | | | | | | | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | |
| | | TNMG160408-CH | 0.8 | | | | | | | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | |
| | | TNMG160412-CH | 1.2 | | | | | | | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | |
| | | TNMG220408-CH | 0.8 | | | | | | | | ● | ● | ● | | | | | | | | | | | | | | | | | | |
| | | TNMG220412-CH | 1.2 | | | | | | | | ● | ● | ● | | | | | | | | | | | | | | | | | | |
| | | TNMG220416-CH | 1.6 | | | | | | | | ● | ● | ● | | | | | | | | | | | | | | | | | | |

● : Line-up

External toolholders → **B208 -**
J series toolholders → **B343, B344**
Internal toolholders → **B294 -**
Cartridges → **F152 -**

# TurnLine - Insert

● : Continuous cutting
c : Light interrupted cutting
✣ : Heavy interrupted cutting

## NEGATIVE TYPE



**Triangular, 60° with hole**

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | | | | | ● | | | | | ●c | | | | ●c | | | | ● | ● | | | | | | |
| M | Stainless | | | | | ● | | | | | | | | | | | | | ● | ● | | | | | | |
| K | Cast iron | ●c | ● | c | ✣ | ● | | | | | ●c | | | | ●c | | | | ● | ● | | | ●c | ● | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | ● | ● | | | | | | |
| S | Superalloys | | | | | ● | | | | | | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | ● | |

| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | | | | Coated cermet | | | | Cermet | | | | Uncoated | | | | Ceramics | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T515 | T5105 | T5115 | T5125 | GH110 | | | | GT720 | | | | NS520 | | | | TH03 | TH10 | | | FX105 | LX21 | LX11 | |
| Finishing to medium cutting | - | TNMA160404 | 0.4 | ● | ● | ● | ● | | | | | | | | | | | | | | ● | | | | | | |
| | | TNMA160408 | 0.8 | ● | ● | ● | ● | | | | | ● | | | | ● | | | | | ● | | | ● | | | |
| | | TNMA160412 | 1.2 | ● | ● | ● | ● | | | | | | | | | | | | | | | | | ● | | | |
| | | TNMA160416 | 1.6 | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | |
| | | TNMA160420 | 2.0 | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | |
| | | TNMA220404 | 0.4 | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | |
| | | TNMA220408 | 0.8 | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | |
| | | TNMA220412 | 1.2 | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | |
| | | TNMA220416 | 1.6 | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | |
| | - | TNGA110304 | 0.4 | | | | | | | | | | | | | | | | | | ● | | | | | | |
| | | TNGA110308 | 0.8 | | | | | | | | | | | | | | | | | | ● | | | | | | |
| | | TNGA160304 | 0.4 | | | | | | | | | | | | | | | | | | ● | | | | | | |
| | | TNGA160308 | 0.8 | | | | | | | | | | | | | | | | | | ● | | | | | | |
| | | TNGA160404 | 0.4 | | | | | ● | | | | | | | | ● | | | | ● | ● | | | | ● | ● | |
| | | TNGA160408 | 0.8 | | | | | ● | | | | | | | | ● | | | | ● | ● | | | ● | ● | ● | |
| | | TNGA160412 | 1.2 | | | | | | | | | | | | | ● | | | | | ● | | | ● | ● | ● | |
| | | TNGA160416 | 1.6 | | | | | | | | | | | | | | | | | | ● | | | ● | | ● | |
| | | TNGA220408 | 0.8 | | | | | | | | | | | | | | | | | | ● | | | | | | |

● : Line-up

External toolholders → B208 -
J series toolholders → B343, B344
Internal toolholders → B294 -
Cartridges → F152 -

● : Continuous cutting
◐ : Light interrupted cutting
✣ : Heavy interrupted cutting

## NEGATIVE TYPE



**Triangular, 60° without hole**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M | Stainless | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| K | Cast iron | ● | | | | ●◐ | | ● | | | | | | | | | | | | | | | | | | | | | | | |
| N | Non-ferrous | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S | Superalloys | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | ● | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | Uncoated | | | Ceramics | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | TH10 | | | FX105 | LX21 | LX11 | | | | | | | | | | | | | | | | | | | | | | |
| Finishing to medium cutting | - | **TNGN160404** | 0.4 | | | | | ● | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | **TNGN160408** | 0.8 | ● | | | | ● | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | **TNGN160412** | 1.2 | ● | | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | **TNGN160416** | 1.6 | | | | ● | | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | **TNGN160420** | 2.0 | | | | ● | | | | | | | | | | | | | | | | | | | | | | | | |
| | | **TNGN160708** | 0.8 | | | | | | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | **TNGN160712** | 1.2 | | | | | | ● | | | | | | | | | | | | | | | | | | | | | | |

● : Line-up



External toolholders for TNGN... → **B234, B235, B240 -**

Internal toolholders for TNGN... → **B312**

# TurnLine - Insert

● : Continuous cutting
c : Light interrupted cutting
✣ : Heavy interrupted cutting

## NEGATIVE TYPE



**Trigon, 80° with hole**

| | | |
|---|---|---|
| P | Steel | ● ●c ●c ✣ ✣ ●c ●c ●c |
| M | Stainless | ●c ●c |
| K | Cast iron | ●c ●c ●c ●c ●c ●c ●c ●c |
| N | Non-ferrous | |
| S | Superalloys | ●c |
| H | Hard materials | |

| Application | Chipbreaker | Designation | Corner radius | Coating T9105 | Coating T9115 | Coating T9125 | Coating T9135 | Coating AH120 | Coated cermet GT9530 | Coated cermet GT720 | Cermet NS9530 | Cermet NS520 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Precision finishing | TF | WNMG080404-TF | 0.4 | | | | | | | | ● | |
| | | WNMG080408-TF | 0.8 | | | | | | | | ● | |
| | 01 | WNGG080402-01 | 0.2 | | | | | | | | ● | ● |
| | | WNGG080404-01 | 0.4 | | | | | | | ● | ● | ● |
| | | WNGG080408-01 | 0.8 | | | | | | | ● | ● | |
| Finishing | TSF | WNMG060404E-TSF | 0.4 | | ● | ● | | | ● | | ● | |
| | | WNMG060408E-TSF | 0.8 | | ● | ● | | | ● | | ● | |
| | | WNMG060412E-TSF | 1.2 | | ● | ● | | | ● | | ● | |
| | | WNMG060404-TSF | 0.4 | | ● | ● | | | | | | |
| | | WNMG060408-TSF | 0.8 | | ● | ● | | | | | | |
| | | WNMG080404-TSF | 0.4 | | ● | ● | ● | ● | ● | | ● | |
| | | WNMG080408-TSF | 0.8 | | ● | ● | ● | ● | ● | | ● | |
| | | WNMG080412-TSF | 1.2 | ● | ● | ● | ● | ● | | | | |
| Finishing (Wiper) | FW | WNMG060404E-FW | 0.4 | ● | ● | ● | | | ● | | ● | |
| | | WNMG060408E-FW | 0.8 | ● | ● | ● | | | ● | | ● | |
| | | WNMG080404-FW | 0.4 | | ● | ● | | | ● | | ● | |
| | | WNMG080408-FW | 0.8 | ● | ● | ● | | | ● | | ● | |
| | AFW | WNMG060404-AFW | 0.4 | | ● | ● | | | | | ● | |
| | | WNMG060408-AFW | 0.8 | ● | ● | ● | ● | | | | ● | |
| | | WNMG080404-AFW | 0.4 | | ● | ● | | | | | ● | |
| | | WNMG080408-AFW | 0.8 | ● | ● | ● | ● | | | | ● | |
| Finishing | ZF | WNMG060404E-ZF | 0.4 | | ● | ● | | | | | | |
| | | WNMG060404-ZF | 0.4 | | ● | ● | | | | | | |
| | | WNMG060408-ZF | 0.8 | | ● | ● | | | | | | |
| | | WNMG080404-ZF | 0.4 | | ● | ● | ● | | ● | | ● | |
| | | WNMG080408-ZF | 0.8 | | ● | ● | ● | | ● | | ● | |
| | | WNMG080412-ZF | 1.2 | | ● | | | | | | | |

● : Line-up

External toolholders → B200 - Internal toolholders → B275 -
TungCap → F046 -

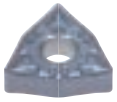
● : Continuous cutting
◐ : Light interrupted cutting
✣ : Heavy interrupted cutting

## NEGATIVE TYPE



**Trigon, 80° with hole**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ●◐ | ◐✣ | ✣ | ◐ | ✣ | ◐✣ | | | | | | | | | ●◐ | | | | ●◐ | ●◐ | | | | | | | | |
| M | Stainless | | | | ● | ◐ | ◐ | | | ● | ◐ | | | | | | | | | | | | | | | | | | |
| K | Cast iron | ●◐ | | | | | | ● | ◐ | | | | | | | ●◐ | | | | ●◐ | ●◐ | | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S | Superalloys | | | | | | | | | ● | ◐ | | | | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | | | | | | Coated cermet | | | | Cermet | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9115 | T9125 | T9135 | T6120 | T6130 | AH630 | T5105 | T5115 | AH8005 | AH8015 | | | | GT9530 | | | | NS9530 | NS520 | | | | | | | |
| Finishing | **11** | **WNMG080404-11** | 0.4 | | | | | | | | | | | | | | | | | | ● | | | | | | | | |
| |  | **WNMG080408-11** | 0.8 | | | | | | | | | | | | | | | | | | ● | | | | | | | | |
| Finishing of mild steels | **17** | **WNMG080404-17** | 0.4 | | | | | | | | | | | | | | | | | | ● | | | | | | | | |
| |  | **WNMG080408-17** | 0.8 | | | | | | | | | | | | | | | | | | ● | | | | | | | | |
| Finishing | **SF** | **WNMG060404-SF** | 0.4 | | | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | |
| |  | **WNMG060408-SF** | 0.8 | | | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | |
| | | **WNMG080404-SF** | 0.4 | | | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | |
| | | **WNMG080408-SF** | 0.8 | | | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | |
| | **CF** | **WNMG080404-CF** | 0.4 | | | | | | | ● | ● | | | | | | | | | | | | | | | | | | |
| |  | **WNMG080408-CF** | 0.8 | | | | | | | ● | ● | | | | | | | | | | | | | | | | | | |
| | | **WNMG080412-CF** | 1.2 | | | | | | | ● | ● | | | | | | | | | | | | | | | | | | |
| | **HRF** | **WNMG080404-HRF** | 0.4 | | | | | | | | | ● | ● | | | | | | | | | | | | | | | | |
| |  | **WNMG080408-HRF** | 0.8 | | | | | | | | | ● | ● | | | | | | | | | | | | | | | | |
| | **TS** | **WNMG080404-TS** | 0.4 | ● | ● | ● | | | | | | | | | | | ● | | | | ● | ● | | | | | | | |
| |  | **WNMG080408-TS** | 0.8 | ● | ● | ● | | | | | | | | | | | ● | | | | ● | ● | | | | | | | |
| | | **WNMG080412-TS** | 1.2 | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | | |

● : Line-up

External toolholders → **B200 -** Internal toolholders → **B275 -**
TungCap → **F046 -**

● : Continuous cutting
◐ : Light interrupted cutting
✣ : Heavy interrupted cutting

## NEGATIVE TYPE



**Trigon, 80° with hole**

| | | |
|---|---|---|
| P | Steel | ● ●◐ ◐✣ ✣ ◐ ✣ ◐✣ ✣ ●◐ |
| M | Stainless | ● ◐ ◐ ✣ ●◐ |
| K | Cast iron | ●◐ ●◐ ●◐ ◐ ●◐ |
| N | Non-ferrous | |
| S | Superalloys | |
| H | Hard materials | |

| Application | Chipbreaker | Designation | Corner radius | Coating T9105 | T9115 | T9125 | T9135 | T6120 | T6130 | AH630 | AH645 | T515 | T5115 | GH330 | Cermet NS9530 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Finishing to medium cutting (Wiper) | SW | WNMG060408E-SW | 0.8 | ● | ● | ● | | | | | | | ● | | |
| | | WNMG060412E-SW | 1.2 | ● | ● | ● | | | | | | | ● | | |
| | | WNMG080408-SW | 0.8 | ● | ● | ● | | | | | | ● | ● | | |
| | | WNMG080412-SW | 1.2 | | ● | ● | | | | | | ● | ● | | |
| | ASW | WNMG060408-ASW | 0.8 | ● | ● | ● | | | | | | | | | |
| | | WNMG060412-ASW | 1.2 | ● | ● | ● | ● | | | | | | | | |
| | | WNMG080408-ASW | 0.8 | ● | ● | ● | ● | | | | | | | | |
| | | WNMG080412-ASW | 1.2 | ● | ● | ● | ● | | | | | | | | |
| High feed, small depth of cutting | AS | WNMG080404-AS | 0.4 | ● | | | | | | | | | | | ● |
| | | WNMG080408-AS | 0.8 | ● | ● | ● | ● | | | | | | | | ● |
| | | WNMG080412-AS | 1.2 | ● | ● | ● | ● | | | | | | | | |
| Boring (Double sided) | CB | WNMG060404-CB | 0.4 | | | ● | | | | | | | | | ● |
| | | WNMG060408-CB | 0.8 | | | ● | | | | | | | | | ● |
| Finishing | NS | WNMG080404-NS | 0.4 | | ● | ● | | | | | | | | | ● |
| | | WNMG080408-NS | 0.8 | | ● | ● | | | | | | | | | ● |
| | SS | WNMG060404E-SS | 0.4 | | | | | | | ● | ● | | | | |
| | | WNMG060408E-SS | 0.8 | | | | | | | ● | ● | | | | |
| | | WNMG060412E-SS | 1.2 | | | | | | | ● | ● | | | | |
| | | WNMG080404-SS | 0.4 | | | | | ● | ● | ● | ● | | | ● | |
| | | WNMG080408-SS | 0.8 | | | | | ● | ● | ● | ● | | | ● | |
| | | WNMG080412-SS | 1.2 | | | | | ● | ● | ● | ● | | | | |

● : Line-up

External toolholders → B200 - Internal toolholders → B275 -
TungCap → F046 -

● : Continuous cutting
◐ : Light interrupted cutting
✣ : Heavy interrupted cutting

## NEGATIVE TYPE



**Trigon, 80° with hole**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ● | ●◐ | ◐✣ | ✣ | ●◐ | ◐ | | | | ●◐ | | | | ●◐ | | | | | | | | | | | | | | | | |
| M | Stainless | | | | | ●◐ | ◐ | | | | | | | | | | | | | | | | | | | | | | | | |
| K | Cast iron | ●◐ | ●◐ | | | ●◐ | ◐ | | | | ●◐ | | | | ●◐ | | | | | | | | | | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S | Superalloys | | | | | ●◐ | ● | | | | | | | | | | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | | Coated cermet | | | | Cermet | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9105 | T9115 | T9125 | T9135 | AH120 | AH725 | GT9530 | | | | NS9530 | | | | | | | | | | | | | | | | | |
| Medium cutting | **TM** | **WNMG060404E-TM** | 0.4 | | ● | ● | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | **WNMG060408E-TM** | 0.8 | | ● | ● | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | **WNMG060412E-TM** | 1.2 | | ● | ● | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | **WNMG060404-TM** | 0.4 | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | | | |
| | | **WNMG060408-TM** | 0.8 | ● | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | | |
| | | **WNMG080404-TM** | 0.4 | ● | ● | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | **WNMG080408-TM** | 0.8 | ● | ● | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | **WNMG080412-TM** | 1.2 | ● | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | | |
| | | **WNMG080416-TM** | 1.6 | ● | ● | ● | | ● | | | | | | | | | | | | | | | | | | | | | | | |
| Finishing to medium cutting | **AM** | **WNMG080408-AM** | 0.8 | | ● | ● | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | **WNMG080412-AM** | 1.2 | | ● | ● | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | **WNMG080416-AM** | 1.6 | | ● | ● | | | | | | | | | | | | | | | | | | | | | | | | | |
| | **NM** | **WNMG060412E-NM** | 1.2 | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | **WNMG080408-NM** | 0.8 | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | **WNMG080412-NM** | 1.2 | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | | | |
| | **TQ** | **WNMG080404-TQ** | 0.4 | | | | | | | ● | | | | ● | | | | | | | | | | | | | | | | | |
| | | **WNMG080408-TQ** | 0.8 | | | | | | | ● | | | | ● | | | | | | | | | | | | | | | | | |
| | **ZM** | **WNMG060408E-ZM** | 0.8 | | ● | ● | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | **WNMG060408-ZM** | 0.8 | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | | | |
| | | **WNMG060412-ZM** | 1.2 | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | | | |
| | | **WNMG080408-ZM** | 0.8 | | ● | ● | ● | | | ● | | | | ● | | | | | | | | | | | | | | | | | |
| | | **WNMG080412-ZM** | 1.2 | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | | | |
| | | **WNMG080416-ZM** | 1.6 | | ● | ● | | | | | | | | | | | | | | | | | | | | | | | | | |

● : Line-up

External toolholders → **B200 -** Internal toolholders → **B275 -**
TungCap → **F046 -**

# TurnLine - Insert

● : Continuous cutting
c : Light interrupted cutting
✣ : Heavy interrupted cutting

## NEGATIVE TYPE



**Trigon, 80° with hole**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ● | ●c | c✣ | ✣ | | | | | ● | ●c | ●c | | | ●c | | | | ●c | ●c | | | ● | | | | |
| M | Stainless | | | | | | | | | ● | ●c | ●c | | | | | | | | | | | ● | | | | |
| K | Cast iron | ●c | ●c | | | ●c | ● | c | ✣ | ● | ●c | ●c | | | ●c | | | | ●c | ●c | | | ● | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | | | | | ● | | | | |
| S | Superalloys | | | | | | | | | ● | ●c | | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | | | | | | | | Coated cermet | | | | Cermet | | | | Uncoated | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9105 | T9115 | T9125 | T9135 | T515 | T5105 | T5115 | T5125 | AH110 | AH120 | GH330 | | GT720 | | | | NS9530 | NS520 | | | TH10 | | | | | |
| Medium cutting | **DM** | **WNMG080408-DM** | 0.8 | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | **WNMG080412-DM** | 1.2 | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | |
| | **All-round** | **WNMG060404** | 0.4 | | ● | ● | | | ● | ● | ● | | | | | | | | | | | | | | | | | | |
| | | **WNMG060408** | 0.8 | | ● | ● | | | ● | ● | ● | | | | | | | | | | | | | | | | | | |
| | | **WNMG080404** | 0.4 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | ● | | | | ● | | | | | |
| | | **WNMG080408** | 0.8 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | ● | ● | | | ● | | | | | |
| | | **WNMG080412** | 1.2 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | | | ● | | | | | |
| | | **WNMG080416** | 1.6 | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | |
| Finishing to medium cutting | **27** | **WNMG080408-27** | 0.8 | | | ● | | | | | | | | | | | | | | | | | | | | | | | |
| Medium cutting | **33** | **WNMG080404-33** | 0.4 | | | | | | | | | | | | | ● | | | | | | | | | | | | | |
| | | **WNMG080408-33** | 0.8 | ● | | | | | | | | | | | | | | | | | | | | ● | | | | | |
| | **37** | **WNMG080404-37** | 0.4 | | | | | | | | | | | | | | | | | ● | | | | | | | | | |
| | | **WNMG080408-37** | 0.8 | | ● | | | | | | | | | ● | | | | | | ● | | | | | | | | | |

● : Line-up

External toolholders → **B200 -** Internal toolholders → **B275 -**
TungCap → **F046 -**

● : Continuous cutting
◐ : Light interrupted cutting
✣ : Heavy interrupted cutting

## NEGATIVE TYPE



**Trigon, 80° with hole**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ◐ | ✣ | ◐✣ | ✣ | | | | | ●◐ | ◐ | | | | | | | | | | | | | | | | | | |
| M | Stainless | ● | ◐ | ◐ | ✣ | | | | | ●◐ | ◐ | ● | ◐ | | | | | | | | | | | | | | | | |
| K | Cast iron | | | | | ●◐ | ● | ◐ | ✣ | ●◐ | ◐ | | | | | | | | ●✣ | | | | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | ●✣ | | | | | | | | | | |
| S | Superalloys | | | | | | | | | ●◐ | ● | ● | ◐ | ◐ | | | | | ●✣ | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | | | | | | | | | | Uncoated | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T6120 | T6130 | AH630 | AH645 | T515 | T5105 | T5115 | T5125 | AH120 | AH725 | AH8005 | AH8015 | AH905 | | KS20 | | | | | | | | | | | |
| Medium cutting | **SM** | **WNMG060404E-SM** | 0.4 | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | | |
| | | **WNMG060408E-SM** | 0.8 | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | | |
| | | **WNMG060412E-SM** | 1.2 | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | | |
| | | **WNMG060408-SM** | 0.8 | | | | | | | | | | ● | | | | | | | | | | | | | | | | |
| | | **WNMG080404-SM** | 0.4 | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | **WNMG080408-SM** | 0.8 | ● | ● | ● | ● | | | | | | ● | | | | | | | | | | | | | | | | |
| | | **WNMG080412-SM** | 1.2 | ● | ● | ● | ● | | | | | | ● | | | | | | | | | | | | | | | | |
| | **CM** | **WNMG080404-CM** | 0.4 | | | | | | | ● | | | | | | | | | | | | | | | | | | | |
| | | **WNMG080408-CM** | 0.8 | | | | | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | |
| | | **WNMG080412-CM** | 1.2 | | | | | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | |
| Finishing to medium cutting | **HRM** | **WNMG080404-HRM** | 0.4 | | | | | | | | | | | ● | ● | | | | | | | | | | | | | | |
| | | **WNMG080408-HRM** | 0.8 | | | | | | | | | | | ● | ● | | | | | | | | | | | | | | |
| | | **WNMG080412-HRM** | 1.2 | | | | | | | | | | | ● | ● | | | | | | | | | | | | | | |
| Medium cutting | **HMM** | **WNMG080404-HMM** | 0.4 | | | | | | | | | | | | | ● | | | | | | | | | | | | | |
| | | **WNMG080408-HMM** | 0.8 | | | | | | | | | | | | | ● | | | | | | | | | | | | | |
| | | **WNMG080412-HMM** | 1.2 | | | | | | | | | | | | | ● | | | | | | | | | | | | | |
| | **SA** | **WNMG080408-SA** | 0.8 | ● | ● | ● | ● | | | | | ● | ● | | | | | ● | | | | | | | | | | | |
| | | **WNMG080412-SA** | 1.2 | ● | ● | ● | ● | | | | | ● | | | | | | | | | | | | | | | | | |

● : Line-up

External toolholders → **B200 -** Internal toolholders → **B275 -**
TungCap → **F046 -**

● : Continuous cutting
◐ : Light interrupted cutting
✣ : Heavy interrupted cutting

## NEGATIVE TYPE



**Trigon, 80° with hole**

| | | |
|---|---|---|
| P | Steel | ● ●◐ ◐✣ ✣ ✣ ◐✣ ✣ ●◐ ●◐ |
| M | Stainless | ◐ ◐ ✣ ●◐ ●◐ |
| K | Cast iron | ●◐ ●◐ ●◐ ●◐ ● ◐ ✣ ●◐ ●◐ ●◐ ● |
| N | Non-ferrous | ● |
| S | Superalloys | ●◐ |
| H | Hard materials | |

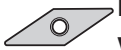
| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | | | | | | | | Cermet | | | | Uncoated | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9105 | T9115 | T9125 | T9135 | T6130 | AH630 | AH645 | T515 | T5105 | T5115 | T5125 | AH120 | NS520 | | | | TH10 | | | | | |
| Medium to heavy cutting | TH | WNMG080408-TH | 0.8 | ● | ● | ● | ● | ● | | | | | | | ● | | | | | | | | | | |
| | | WNMG080412-TH | 1.2 | ● | ● | ● | ● | | | | | | | | ● | | | | | | | | | | |
| | | WNMG080416-TH | 1.6 | ● | ● | ● | | | | | | | | | | | | | | | | | | | |
| | | WNMG100612-TH | 1.2 | | ● | ● | | | | | | | | | | | | | | | | | | | |
| | | WNMG100616-TH | 1.6 | | ● | ● | | | | | | | | | | | | | | | | | | | |
| | THS | WNMG080408-THS | 0.8 | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | |
| | | WNMG080412-THS | 1.2 | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | |
| | | WNMG080416-THS | 1.6 | | ● | ● | | | | | | | | | | | | | | | | | | | |
| | | WNMG100612-THS | 1.2 | | ● | ● | ● | | | | | | | | | | | | | | | | | | |
| | | WNMG100616-THS | 1.6 | | ● | ● | ● | | | | | | | | | | | | | | | | | | |
| | SH | WNMG080408-SH | 0.8 | | | | | ● | ● | ● | | | | | | | | | | | | | | | |
| | | WNMG080412-SH | 1.2 | | | | | ● | ● | ● | | | | | | | | | | | | | | | |
| | CH | WNMG080408-CH | 0.8 | | | | | | | | | ● | ● | ● | | | | | | | | | | | |
| | | WNMG080412-CH | 1.2 | | | | | | | | | ● | ● | ● | | | | | | | | | | | |
| Finishing to medium cutting | - | WNMA080404 | 0.4 | | | | | | | | | ● | ● | ● | | | | | | ● | | | | | |
| | | WNMA080408 | 0.8 | | | | | | | | ● | ● | ● | ● | | ● | | | | ● | | | | | |
| | | WNMA080412 | 1.2 | | | | | | | | ● | ● | ● | ● | | | | | | | | | | | |
| | | WNMA080416 | 1.6 | | | | | | | | ● | ● | ● | ● | | | | | | | | | | | |

● : Line-up

External toolholders → B206 - Internal toolholders → B275 -
TungCap → B215, F046 -

● : Continuous cutting
ɔ : Light interrupted cutting
✣ : Heavy interrupted cutting

## NEGATIVE TYPE



**Rhombic, 35° with hole**

| | | |
|---|---|---|
| P | Steel | ● ●ɔ ɔ✣ ✣ ɔ ✣ ɔ✣ ●ɔ ● ●ɔ |
| M | Stainless | ● ɔ ɔ ●ɔ ● ●ɔ |
| K | Cast iron | ●ɔ ●ɔ ●ɔ ● ●ɔ ●ɔ ●ɔ ●ɔ ●ɔ |
| N | Non-ferrous | ● |
| S | Superalloys | ●ɔ ● |
| H | Hard materials | |

| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | | | | | | Coated cermet | | Cermet | | Uncoated |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9105 | T9115 | T9125 | T9135 | T6120 | T6130 | AH630 | AH120 | GH110 | GH330 | GT9530 | GT720 | NS9530 | NS520 | TH10 |
| Precision finishing | **TF** | **VNMG160404-TF** | 0.4 | | | | | | | | | | | | | ● | | |
| | | **VNMG160408-TF** | 0.8 | | | | | | | | | | | | ● | ● | | |
| | **01** | **VNGG160402-01** | 0.2 | | | | | | | | | ● | | | | ● | ● | ● |
| | | **VNGG160404-01** | 0.4 | | | | | | | | | | | | | ● | ● | ● |
| | | **VNGG160408-01** | 0.8 | | | | | | | | | | | | | ● | ● | |
| Finishing | **TSF** | **VNMG160402-TSF** | 0.2 | | | | | | | | ● | | | ● | | ● | | |
| | | **VNMG160404-TSF** | 0.4 | ● | ● | ● | ● | | | | ● | | | ● | | ● | | |
| | | **VNMG160408-TSF** | 0.8 | ● | ● | ● | ● | | | | ● | | | ● | | ● | | |
| | | **VNMG160412-TSF** | 1.2 | ● | ● | ● | ● | | | | | | | | | | | |
| | **ZF** | **VNMG160404-ZF** | 0.4 | | ● | ● | ● | | | | | | | ● | | ● | | |
| | | **VNMG160408-ZF** | 0.8 | | ● | ● | ● | | | | | | | ● | | ● | | |
| | | **VNMG160412-ZF** | 1.2 | | ● | ● | ● | | | | | | | | | | | |
| | **11** | **VNMG160404-11** | 0.4 | | | | | | | | | | ● | | | ● | | ● |
| | | **VNMG160408-11** | 0.8 | | | | | | | | | | | | | ● | | |
| | | **VNMG160412-11** | 1.2 | | | | | | | | | | | | | ● | | |
| | **SF** | **VNMG160404-SF** | 0.4 | | | | | ● | ● | ● | | | | | | | | |
| | | **VNMG160408-SF** | 0.8 | | | | | ● | ● | ● | | | | | | | | |

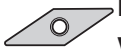
● : Line-up

External toolholders → **B207 -** Internal toolholders → **B296, B299**

# TurnLine - Insert

● : Continuous cutting
c : Light interrupted cutting
✣ : Heavy interrupted cutting

## NEGATIVE TYPE



**Rhombic, 35° with hole**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ● | ●c | c✣ | ✣ | c | ✣ | c✣ | ✣ | | | ● | ●c | | | ●c | | | ●c | | | | | | | ●c | ●c | | | | |
| M | Stainless | | | | | ● | c | c | ✣ | | | ● | ●c | ● | c | ●c | | | | | | | | | | | | | | | |
| K | Cast iron | ●c | ●c | | | | | | | ● | c | ● | ●c | | | ●c | | | ●c | | | | | | | ●c | ●c | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S | Superalloys | | | | | | | | | | | ● | ●c | ● | c | | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

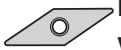
| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | | | | | | | | | | | | Coated cermet | | | | Cermet | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9105 | T9115 | T9125 | T9135 | T6120 | T6130 | AH630 | AH645 | T5105 | T5115 | AH110 | AH120 | AH8005 | AH8015 | GH330 | | GT9530 | | | | NS9530 | NS520 | | |
| Finishing | CF | VNMG160404-CF | 0.4 | | | | | | | | | ● | ● | | | | | | | | | | | | | | |
| | | VNMG160408-CF | 0.8 | | | | | | | | | ● | ● | | | | | | | | | | | | | | |
| | HRF | VNMG160404-HRF | 0.4 | | | | | | | | | | | | | ● | ● | | | | | | | | | | |
| | | VNMG160408-HRF | 0.8 | | | | | | | | | | | | | ● | ● | | | | | | | | | | |
| | TS | VNMG160404-TS | 0.4 | | ● | ● | ● | | | | | | | | | | | | | ● | | | | ● | ● | | |
| | | VNMG160408-TS | 0.8 | | ● | ● | ● | | | | | | | | | | | | | ● | | | | ● | ● | | |
| | | VNMG160412-TS | 1.2 | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | |
| | SS | VNMG160404-SS | 0.4 | | | | | ● | ● | ● | ● | | | | ● | | | ● | | | | | | | | | |
| | | VNMG160408-SS | 0.8 | | | | | ● | ● | ● | ● | | | | ● | | | ● | | | | | | | | | |
| | | VNMG160412-SS | 1.2 | | | | | ● | ● | ● | ● | | | | | | | ● | | | | | | | | | |
| Medium cutting | TM | VNMG160404-TM | 0.4 | ● | ● | ● | ● | | ● | | | | | | ● | | | | | | | | | | | | |
| | | VNMG160408-TM | 0.8 | ● | ● | ● | ● | | | | | | | ● | ● | | | | | | | | | | | | |
| | | VNMG160412-TM | 1.2 | ● | ● | ● | ● | | | | | | | ● | | | | | | | | | | | | | |

● : Line-up

External toolholders → **B207 -** Internal toolholders → **B296, B299**

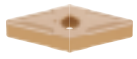
● : Continuous cutting
ɔ : Light interrupted cutting
✣ : Heavy interrupted cutting

## NEGATIVE TYPE



**Rhombic, 35° with hole**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ● | ●ɔ | ɔ✣ | ✣ | | | | | ● | ●ɔ | | | | ●ɔ | | | | ●ɔ | | | | ● | | | | |
| M | Stainless | | | | | | | | | ● | ●ɔ | | | | | | | | | | | | ● | | | | |
| K | Cast iron | ●ɔ | ●ɔ | | | ●ɔ | ● | ɔ | ✣ | ● | ●ɔ | | | | ●ɔ | | | | ●ɔ | | | | ● | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | | | | | ● | | | | |
| S | Superalloys | | | | | | | | | ● | ●ɔ | | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | | |

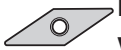
| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | | | | | | Coated cermet | | | | Cermet | | | | Uncoated | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9105 | T9115 | T9125 | T9135 | T515 | T5105 | T5115 | T5125 | AH110 | AH120 | GT9530 | | | | NS9530 | | | | TH10 | | | | |
| Finishing to medium cutting | **TQ** | **VNMG160404-TQ** | 0.4 | | | | | | | | | | | ● | | | | ● | | | | | | | | |
| | | **VNMG160408-TQ** | 0.8 | | | | | | | | | | | ● | | | | ● | | | | | | | | |
| |  | | | | | | | | | | | | | | | | | | | | | | | | | |
| | **ZM** | **VNMG160408-ZM** | 0.8 | | ● | ● | ● | | | | | | | | | | | | | | | | | | | |
| | | **VNMG160412-ZM** | 1.2 | | ● | ● | ● | | | | | | | | | | | | | | | | | | | |
| |  | | | | | | | | | | | | | | | | | | | | | | | | | |
| Medium cutting | **DM** | **VNMG160408-DM** | 0.8 | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | | |
| | | **VNMG160412-DM** | 1.2 | | ● | ● | ● | | | | | | | | | | | | | | | | | | | |
| |  | | | | | | | | | | | | | | | | | | | | | | | | | |
| | **All-round** | **VNMG160404** | 0.4 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | ● | | | | ● | | | | |
| | | **VNMG160408** | 0.8 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | ● | | | | ● | | | | |
| | | **VNMG160412** | 1.2 | | ● | ● | | ● | ● | ● | ● | | | | | | | ● | | | | | | | | |
| |  | | | | | | | | | | | | | | | | | | | | | | | | | |
| | **28** | **VNMG160404-28** | 0.4 | | | | | | | | | | ● | | | | | | | | | | | | | |
| | | **VNMG160408-28** | 0.8 | | | | | | | | | | ● | | | | | | | | | | | | | |
| |  | | | | | | | | | | | | | | | | | | | | | | | | | |
| | **33** | **VNMG160404-33** | 0.4 | | | ● | | | | | | ● | | | | | | | | | | ● | | | | |
| | | **VNMG160408-33** | 0.8 | | ● | | | | | | | | | | | | | | | | | ● | | | | |
| |  | | | | | | | | | | | | | | | | | | | | | | | | | |

● : Line-up

External toolholders → **B207 -** Internal toolholders → **B296, B299**

● : Continuous cutting
◐ : Light interrupted cutting
✣ : Heavy interrupted cutting

## NEGATIVE TYPE



**Rhombic, 35° with hole**

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ◐ | ✣ | ◐✣ | ✣ | | | | | | | | | | | ●◐ | | | | ● | | | | | | |
| M | Stainless | ● | ◐ | ◐ | ✣ | | | | ● | ◐ | | | | | | | | | | ● | | | | | | |
| K | Cast iron | | | | | ● | ◐ | ✣ | | | | | | | | ●◐ | | | | ● | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | | ● | | | | | | |
| S | Superalloys | | | | | | | | ● | ◐ | ◐ | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | | | | | | Cermet | | | | Uncoated | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T6120 | T6130 | AH630 | AH645 | T5105 | T5115 | T5125 | AH8005 | AH8015 | AH905 | | | | | | | | | | | | |
| Medium cutting | SM | VNMG160404-SM | 0.4 | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | |
| | | VNMG160408-SM | 0.8 | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | |
| | | VNMG160412-SM | 1.2 | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | |
| | CM | VNMG160408-CM | 0.8 | | | | | ● | ● | ● | | | | | | | | | | | | | | | |
| | | VNMG160412-CM | 1.2 | | | | | ● | ● | ● | | | | | | | | | | | | | | | |
| Finishing to medium cutting | HRM | VNMG160404-HRM | 0.4 | | | | | | | | ● | ● | | | | | | | | | | | | | |
| | | VNMG160408-HRM | 0.8 | | | | | | | | ● | ● | | | | | | | | | | | | | |
| | | VNMG160412-HRM | 1.2 | | | | | | | | ● | ● | | | | | | | | | | | | | |
| Medium cutting | HMM | VNMG160404-HMM | 0.4 | | | | | | | | | | ● | | | | | | | | | | | | |
| | | VNMG160408-HMM | 0.8 | | | | | | | | | | ● | | | | | | | | | | | | |
| | | VNMG160412-HMM | 1.2 | | | | | | | | | | ● | | | | | | | | | | | | |
| Finishing to medium cutting | - | VNMA160402 | 0.2 | | | | | | | | | | | | | | | | ● | | | | | | |
| | | VNMA160404 | 0.4 | | | | | ● | ● | ● | | | | ● | | | | | ● | | | | | | |
| | | VNMA160408 | 0.8 | | | | | ● | ● | ● | | | | ● | | | | | ● | | | | | | |

● : Line-up

External toolholders → B207 - Internal toolholders → B296, B299

● : Continuous cutting
ɔ : Light interrupted cutting
✣ : Heavy interrupted cutting

## NEGATIVE TYPE



### Rhombic, 35° without hole

| | |
|---|---|
| P | Steel |
| M | Stainless |
| K | Cast iron |
| N | Non-ferrous |
| S | Superalloys |
| H | Hard materials |

| Application | Chipbreaker | Designation | Corner radius | Ceramics: FX105 |
|---|---|---|---|---|
| Finishing to medium cutting | - | **VNGD160712** | 1.2 | ● |



### Rhombic, 25° with hole

| | |
|---|---|
| P | Steel |
| M | Stainless |
| K | Cast iron |
| N | Non-ferrous |
| S | Superalloys |
| H | Hard materials |

| Application | Chipbreaker | Designation | Corner radius | Coating: T9125 | Coating: T9135 | Coated cermet: GT9530 | Cermet: NS9530 |
|---|---|---|---|---|---|---|---|
| Finishing to medium cutting | **ZF** | **YNMG160404-ZF** | 0.4 | ● | ● | ● | ● |
| | | **YNMG160408-ZF** | 0.8 | ● | ● | ● | ● |
| | **ZM** | **YNMG160404-ZM** | 0.4 | ● | ● | ● | ● |
| | | **YNMG160408-ZM** | 0.8 | ● | ● | ● | ● |





● : Line-up



VNGD... : External toolholders → **B255**

YNMG... : External toolholders → **B207, B208, B213**, Internal toolholders → **B296, B299**

● : Continuous cutting
ⓒ : Light interrupted cutting
✣ : Heavy interrupted cutting

## NEGATIVE TYPE

### Round, with hole

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ● | ●ⓒ | ⓒ✣ | ✣ | ●ⓒ | | | | ● | | | | | | | | | | | | | | | | | | | | | | |
| M | Stainless | | | | | ●ⓒ | | | | ● | | | | | | | | | | | | | | | | | | | | | | |
| K | Cast iron | ●ⓒ | ●ⓒ | | | ●ⓒ | | | | ● | | | | | | | | | | | | | | | | | | | | | | |
| N | Non-ferrous | | | | | | | | | ● | | | | | | | | | | | | | | | | | | | | | | |
| S | Superalloys | | | | | ●ⓒ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | ● | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | | | | Uncoated | | | | Ceramics | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9105 | T9115 | T9125 | T9135 | AH120 | | | | TH10 | | | | LX11 | | | | | | | | | | | | | | | | |
| Heavy cutting | 61 | RNMG090300-61 | - | | ● | ● | | | | | | | | | | | | | | | | | | | | | | | | | | |
| |  | RNMG120400-61 | - | ● | ● | ● | ● | ● | | | | ● | | | | | | | | | | | | | | | | | | | | |
| | | RNMG150600-61 | - | | ● | ● | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | RNMG190600-61 | - | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | RNMG250900-61 | - | | ● | ● | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Finishing to medium cutting | - | RNGA120400 | - | | | | | | | | | | | | | ● | | | | | | | | | | | | | | | | |
| |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

### Round, without hole

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M | Stainless | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| K | Cast iron | ●ⓒ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S | Superalloys | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| H | Hard materials | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | Ceramics | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | FX105 | LX11 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Finishing to medium cutting | - | RNGN120400 | - | ● | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| |  | RNGN120700 | - | ● | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | |

● : Line-up

RNMG..., RNGA... : External toolholders → **B213 -**

● : Continuous cutting
ɔ : Light interrupted cutting
✣ : Heavy interrupted cutting

## NEGATIVE TYPE



**Parallelogram, 55° without hole**

| | | |

# TurnLine - Insert

● : Continuous cutting
ɔ : Light interrupted cutting
✣ : Heavy interrupted cutting

## POSITIVE TYPE



**Rhombic, 80° with hole Positive 7°**

| | | |
|---|---|---|
| P | Steel | ●ɔ ɔ✣ ✣ ɔ ɔ |
| M | Stainless | ɔ ɔ ● ɔ ɔ |
| K | Cast iron | ●ɔ ɔ ɔ |
| N | Non-ferrous | |
| S | Superalloys | ● ● ɔ |
| H | Hard materials | |

| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | | | | | | Coated cermet | | | | Cermet | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9115 | T9125 | T6130 | AH725 | AH8005 | AH8015 | GH730 | SH725 | J740 | | | GT9530 | | | | NS9530 | | | | | | | |
| Precision finishing | 01 | CCGT060202-01 | 0.2 | | | | | | | | | ● | | | | | | | | | | | | | | |
| | | CCGT09T302-01 | 0.2 | | | | | | | | | ● | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Precision finishing (Sharp edgeds) | 01 | CCGT060202F-01 | 0.2 | | | | | | | | ● | | | | | | | | | | | | | | | |
| | | CCGT060204F-01 | 0.4 | | | | | | | | ● | | | | | | | | | | | | | | | |
| | | CCGT09T302F-01 | 0.2 | | | | | | | | ● | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Finishing | PSF | CCMT060202-PSF | 0.2 | | | | ● | | | | | | | | ● | | | | ● | | | | | | | |
| | | CCMT060204-PSF | 0.4 | ● | ● | | ● | ● | ● | | | | | | ● | | | | ● | | | | | | | |
| | | CCMT09T302-PSF | 0.2 | | | | ● | | | | | | | | | | | | ● | | | | | | | |
| | | CCMT09T304-PSF | 0.4 | ● | ● | | ● | ● | ● | | | | | | ● | | | | ● | | | | | | | |
| | | CCMT09T308-PSF | 0.8 | ● | ● | | ● | | | | | | | | ● | | | | ● | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | PF | CCMT060202-PF | 0.2 | | | | | | | ● | | | | | ● | | | | ● | | | | | | | |
| | | CCMT060204-PF | 0.4 | | | ● | | | | ● | | | | | ● | | | | ● | | | | | | | |
| | | CCMT060208-PF | 0.8 | | | | | | | | | | | | ● | | | | ● | | | | | | | |
| | | CCMT09T302-PF | 0.2 | | | | | | | ● | | | | | | | | | ● | | | | | | | |
| | | CCMT09T304-PF | 0.4 | | | | | | | ● | | | | | ● | | | | ● | | | | | | | |
| | | CCMT09T308-PF | 0.8 | | ● | | | | | | | | | | ● | | | | ● | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | |

● : Line-up

External toolholders → B245
Internal toolholders → B278, B301
J series toolholders → B328 - B331
PINZBOHR® → F136 - F151

● : Continuous cutting
ɔ : Light interrupted cutting
✣ : Heavy interrupted cutting

## POSITIVE TYPE



**Rhombic, 80° with hole Positive 7°**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ●ɔ | ɔ✣ | ɔ | ✣ | ɔ✣ | ✣ | ●ɔ | ɔ | | | ɔ | | | | ●ɔ | | | | ●ɔ | | | | | | | | | |
| M | Stainless | | | ● | ɔ | ɔ | ✣ | ●ɔ | ɔ | ● | ɔ | ɔ | | | | | | | | | | | | | | | | | |
| K | Cast iron | ●ɔ | | | | | | ●ɔ | ɔ | | | ɔ | | | | ●ɔ | | | | ●ɔ | | | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S | Superalloys | | | | | | | ●ɔ | ● | ● | ɔ | | | | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | | | | | | | | Coated cermet | | | | Cermet | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9115 | T9125 | T6120 | T6130 | AH630 | AH645 | AH120 | AH725 | AH8005 | AH8015 | GH730 | | GT9530 | | | | NS9530 | | | | | | | | | |
| Finishing to light cutting | **PSS** | **CCMT060204-PSS** | 0.4 | ● | ● | ● | ● | ● | ● | | ● | ● | ● | | | ● | | | | ● | | | | | | | | | |
| | | **CCMT060208-PSS** | 0.8 | ● | ● | ● | ● | ● | ● | | ● | ● | ● | | | ● | | | | ● | | | | | | | | | |
| | | **CCMT09T304-PSS** | 0.4 | ● | ● | ● | ● | ● | ● | | ● | ● | ● | | | ● | | | | ● | | | | | | | | | |
| | | **CCMT09T308-PSS** | 0.8 | ● | ● | ● | ● | ● | ● | | ● | ● | ● | | | ● | | | | ● | | | | | | | | | |
| | | **CCMT120404-PSS** | 0.4 | ● | ● | ● | ● | ● | ● | | ● | | | | | | | | | | | | | | | | | | |
| | | **CCMT120408-PSS** | 0.8 | ● | ● | ● | ● | ● | ● | | ● | | | | | | | | | | | | | | | | | | |
| | | **CCMT120412-PSS** | 1.2 | ● | ● | ● | ● | ● | ● | | ● | | | | | | | | | | | | | | | | | | |
| Finishing to medium cutting | **PS** | **CCMT060202-PS** | 0.2 | ● | ● | ● | ● | ● | ● | ● | ● | | | ● | | ● | | | | ● | | | | | | | | | |
| | | **CCMT060204-PS** | 0.4 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | | | | ● | | | | | | | | | |
| | | **CCMT060208-PS** | 0.8 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | | | | ● | | | | | | | | | |
| | | **CCMT09T302-PS** | 0.2 | ● | ● | ● | ● | ● | ● | ● | ● | | | ● | | ● | | | | ● | | | | | | | | | |
| | | **CCMT09T304-PS** | 0.4 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | | | | ● | | | | | | | | | |
| | | **CCMT09T308-PS** | 0.8 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | | | | ● | | | | | | | | | |
| | | **CCMT120404-PS** | 0.4 | ● | ● | ● | ● | ● | ● | | ● | ● | ● | | | | | | | | | | | | | | | | |
| | | **CCMT120408-PS** | 0.8 | ● | ● | ● | ● | ● | ● | | ● | ● | ● | | | | | | | | | | | | | | | | |
| | | **CCMT120412-PS** | 1.2 | ● | ● | ● | ● | ● | ● | | ● | | | | | | | | | | | | | | | | | | |
| | **23** | **CCMT060202-23** | 0.2 | | | | | | | | | | | | | | | | | ● | | | | | | | | | |
| | | **CCMT060204-23** | 0.4 | | ● | | | | | | | | | | | | | | | ● | | | | | | | | | |
| | | **CCMT060208-23** | 0.8 | | ● | | | | | | | | | | | | | | | | | | | | | | | | |
| | | **CCMT09T304-23** | 0.4 | | ● | | | | | | | | | | | | | | | ● | | | | | | | | | |
| | | **CCMT09T308-23** | 0.8 | | ● | | | | | | | | | | | | | | | ● | | | | | | | | | |
| Medium cutting | **24** | **CCMT060202-24** | 0.2 | | ● | | | | | | | | | | | | | | | ● | | | | | | | | | |
| | | **CCMT060204-24** | 0.4 | ● | ● | | | | | ● | | | | | | | | | | ● | | | | | | | | | |
| | | **CCMT060208-24** | 0.8 | ● | ● | | ● | | | | | | | | | | | | | ● | | | | | | | | | |
| | | **CCMT09T302-24** | 0.2 | | ● | | | | | | | | | | | | | | | ● | | | | | | | | | |
| | | **CCMT09T304-24** | 0.4 | ● | ● | | | | | | | | | | | | | | | ● | | | | | | | | | |
| | | **CCMT09T308-24** | 0.8 | ● | ● | | ● | | | | | | | | | | | | | ● | | | | | | | | | |
| | | **CCMT120408-24** | 0.8 | ● | ● | | | | | ● | | | | | | | | | | ● | | | | | | | | | |

● : Line-up


External toolholders → **B245**
Internal toolholders → **B278, B301**
J series toolholders → **B328 - B331**
PINZBOHR® → **F136 - F151**

# TurnLine - Insert

## POSITIVE TYPE



**Rhombic, 80° with hole Positive 7°**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ●ᑕ | ●ᑕ | | | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | |
| M | Stainless | ●ᑕ | ●ᑕ | | | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | |
| K | Cast iron | | | | | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | |
| N | Non-ferrous | | | | | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | |
| S | Superalloys | | ●ᑕ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | Uncoated | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | SH725 | SH730 | | | | TH10 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Finishing | W08 | CCGT03X100R-W08 | 0.03 | | ● | | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | CCGT03X100L-W08 | 0.03 | | ● | | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | CCGT03X101R-W08 | 0.1 | | ● | | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | CCGT03X101L-W08 | 0.1 | | ● | | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | CCGT03X102R-W08 | 0.2 | | ● | | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | CCGT03X102L-W08 | 0.2 | | ● | | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | CCGT03X104R-W08 | 0.4 | | ● | | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | CCGT03X104L-W08 | 0.4 | | ● | | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | CCGT04T100R-W08 | 0.03 | | ● | | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | CCGT04T100L-W08 | 0.03 | | ● | | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | CCGT04T101R-W08 | 0.1 | | ● | | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | CCGT04T101L-W08 | 0.1 | | ● | | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | CCGT04T102R-W08 | 0.2 | | ● | | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | CCGT04T102L-W08 | 0.2 | | ● | | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | CCGT04T104R-W08 | 0.4 | | ● | | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | CCGT04T104L-W08 | 0.4 | | ● | | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | |
| Finishing (Sharp edge) | W08 | CCGT03X100FL-W08 | 0.03 | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | CCGT03X100FR-W08 | 0.03 | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | CCGT03X101FL-W08 | 0.1 | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | CCGT03X101FR-W08 | 0.1 | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | CCGT03X102FL-W08 | 0.2 | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | CCGT03X102FR-W08 | 0.2 | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | CCGT03X104FL-W08 | 0.4 | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | CCGT03X104FR-W08 | 0.4 | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | CCGT04T100FL-W08 | 0.03 | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | CCGT04T100FR-W08 | 0.03 | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | CCGT04T101FL-W08 | 0.1 | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | CCGT04T101FR-W08 | 0.1 | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | CCGT04T102FL-W08 | 0.2 | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | CCGT04T102FR-W08 | 0.2 | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | CCGT04T104FL-W08 | 0.4 | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | CCGT04T104FR-W08 | 0.4 | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

● : Line-up

Internal toolholders → B278
PINZBOHR® → F136 - F151

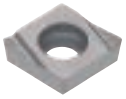
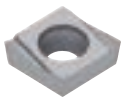
● : Continuous cutting
ɔ : Light interrupted cutting
✣ : Heavy interrupted cutting

## POSITIVE TYPE



**Rhombic, 80° with hole Positive 7°**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ●ɔ | ɔ✣ | ɔ | ✣ | ɔ✣ | ✣ | | | ●ɔ | ɔ | ● | ●ɔ | ɔ | | ●ɔ | | | | | ●ɔ | | | | ● | ɔ | | | | | |
| M | Stainless | | | ● | ɔ | ɔ | ✣ | | | ●ɔ | ɔ | ● | ●ɔ | ɔ | | | | | | | | | | | ● | ɔ | | | | | |
| K | Cast iron | ●ɔ | | | | | | ●ɔ | ɔ | ●ɔ | ɔ | ● | ●ɔ | ɔ | | ●ɔ | | | | | ●ɔ | | | | ● | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | | | | | | | ● | | | | | | |
| S | Superalloys | | | | | | | | | ●ɔ | ● | ● | | | | | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | | | | | | | | | | Coated cermet | | | | Cermet | | | | Uncoated | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9115 | T9125 | T6120 | T6130 | AH630 | AH645 | T515 | T5115 | AH120 | AH725 | GH110 | GH330 | GH730 | | GT9530 | | | | NS9530 | | | | TH10 | UX30 | | |
| Finishing | **W15** | **CCGT060200R-W15** | 0.03 | | | | | | | | | | | | | | | | | | | | | | | ● | | | |
| |  | **CCGT060200L-W15** | 0.03 | | | | | | | | | | | | | | | | | | | ● | | | | ● | | | |
| | | **CCGT060202R-W15** | 0.2 | | | | | | | | | | | | | | | | | | | ● | | | | ● | | | |
| | | **CCGT060202L-W15** | 0.2 | | | | | | | | | | | | | | | ● | | | | ● | | | | ● | | | |
| | | **CCGT060204R-W15** | 0.4 | | | | | | | | | | | | ● | | | | | | | ● | | | | ● | | | |
| | | **CCGT060204L-W15** | 0.4 | | | | | | | | | | | ● | ● | | | ● | | | | ● | | | | ● | ● | | |
| | **W20** | **CCGT09T302R-W20** | 0.2 | | | | | | | | | | | | | | | | | | | ● | | | | ● | | | |
| | | **CCGT09T302L-W20** | 0.2 | | | | | | | | | | | | | | | ● | | | | ● | | | | ● | | | |
| |  | **CCGT09T304R-W20** | 0.4 | | | | | | | | | | | | | | | | | | | ● | | | | | | | |
| | | **CCGT09T304L-W20** | 0.4 | | | | | | | | | | | ● | ● | | | ● | | | | ● | | | | ● | | | |
| | | **CCGT09T308R-W20** | 0.8 | | | | | | | | | | | | | | | | | | | ● | | | | | | | |
| | | **CCGT09T308L-W20** | 0.8 | | | | | | | | | | | | | | | ● | | | | ● | | | | | | | |
| Medium cutting | **PM** | **CCMT060204-PM** | 0.4 | ● | ● | ● | ● | ● | ● | | | ● | ● | | | ● | | ● | | | | ● | | | | | | | |
| | | **CCMT060208-PM** | 0.8 | ● | ● | ● | ● | ● | ● | | | ● | ● | | | ● | | ● | | | | ● | | | | | | | |
| |  | **CCMT09T304-PM** | 0.4 | ● | ● | ● | ● | ● | ● | | | ● | ● | | | ● | | ● | | | | ● | | | | | | | |
| | | **CCMT09T308-PM** | 0.8 | ● | ● | ● | ● | ● | ● | | | ● | ● | | | ● | | ● | | | | ● | | | | | | | |
| | | **CCMT09T312-PM** | 1.2 | ● | ● | ● | ● | ● | ● | | | | ● | | | | | | | | | | | | | | | | |
| | | **CCMT120408-PM** | 0.8 | | | ● | ● | ● | ● | | | | ● | | | | | | | | | | | | | | | | |
| | | **CCMT120412-PM** | 1.2 | | | ● | ● | ● | ● | | | | ● | | | | | | | | | | | | | | | | |
| Finishing to medium cutting | **CM** | **CCMT060204-CM** | 0.4 | | | | | | | ● | ● | | | | | | | | | | | | | | | | | | |
| | | **CCMT060208-CM** | 0.8 | | | | | | | ● | ● | | | | | | | | | | | | | | | | | | |
| |  | **CCMT09T304-CM** | 0.4 | | | | | | | ● | ● | | | | | | | | | | | | | | | | | | |
| | | **CCMT09T308-CM** | 0.8 | | | | | | | ● | ● | | | | | | | | | | | | | | | | | | |
| | | **CCMT09T312-CM** | 1.2 | | | | | | | | ● | | | | | | | | | | | | | | | | | | |
| | | **CCMT120404-CM** | 0.4 | | | | | | | | ● | | | | | | | | | | | | | | | | | | |
| | | **CCMT120408-CM** | 0.8 | | | | | | | | ● | | | | | | | | | | | | | | | | | | |

● : Line-up

External toolholders → **B245** Internal toolholders → **B278, B301**
J series toolholders → **B328 - B331** PINZBOHR® → **F136 - F151**

# TurnLine - Insert

● : Continuous cutting
ɔ : Light interrupted cutting
✣ : Heavy interrupted cutting

## POSITIVE TYPE



**Rhombic, 80° with hole Positive 7°**

| | | Coating | | | Cermet | | | Uncoated | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | | ● | | ●ɔ | | | ● | | | |
| M | Stainless | | ● | | | | | ● | | | |
| K | Cast iron | ɔ | ● | | ●ɔ | | | ● | ● | | |
| N | Non-ferrous | | | | | | | ● | ● | | |
| S | Superalloys | | ● | | | | | | ● | | |
| H | Hard materials | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T5115 | GH110 | NS9530 | TH10 | KS05F |
|---|---|---|---|---|---|---|---|---|
| Finishing to medium cutting | AL | CCGT060202-AL | 0.2 | | | | | ● |
| | | CCGT060204-AL | 0.4 | | | | | ● |
| | | CCGT09T302-AL | 0.2 | | | | | ● |
| | | CCGT09T304-AL | 0.4 | | | | | ● |
| | | CCGT09T308-AL | 0.8 | | | | | ● |
| | | CCGT120402-AL | 0.2 | | | | | ● |
| | | CCGT120404-AL | 0.4 | | | | | ● |
| | | CCGT120408-AL | 0.8 | | | | | ● |
| | All-round | CCGT060202 | 0.2 | | | ● | | |
| | | CCGT060204 | 0.4 | | | ● | | |
| | | CCGT09T302 | 0.2 | | | ● | | |
| | | CCGT09T304 | 0.4 | | | ● | | |
| | | CCGT09T308 | 0.8 | | | ● | | |
| | Angular | CCGT060200R | 0.03 | | | | ● | |
| | | CCGT060202R | 0.2 | | | | ● | |
| | | CCGT060202L | 0.2 | | | | ● | |
| | | CCGT060204L | 0.4 | | | | ● | |
| | | CCGT09T302R | 0.2 | | | | ● | |
| | | CCGT09T302L | 0.2 | | | | ● | |
| | | CCGT09T304R | 0.4 | | | | ● | |
| | | CCGT09T304L | 0.4 | | | | ● | |
| | - | CCMW060204 | 0.4 | ● | | | | |
| | | CCMW060208 | 0.8 | ● | | | | |
| | | CCMW09T304 | 0.4 | ● | | | | |
| | | CCMW09T308 | 0.8 | ● | | | | |
| | - | CCGW060202 | 0.2 | | | | ● | |
| | | CCGW060204 | 0.4 | | | | ● | |
| | | CCGW09T304 | 0.4 | | ● | | ● | |

● : Line-up

External toolholders → B245
Internal toolholders → B278, B301
J series toolholders → B328 - B331
PINZBOHR® → F136 - F151

● : Continuous cutting
ɔ : Light interrupted cutting
✣ : Heavy interrupted cutting

## POSITIVE TYPE



**Rhombic, 80° with hole Positive 7°**

| | | |
|---|---|---|
| P | Steel | ɔ ●ɔ ●ɔ |
| M | Stainless | ɔ ●ɔ ●ɔ |
| K | Cast iron | ɔ |
| N | Non-ferrous | |
| S | Superalloys | ● ●ɔ |
| H | Hard materials | |

| Application | Chipbreaker | Designation | Corner radius | Coating AH725 | SH725 | SH730 |
|---|---|---|---|---|---|---|
| For internal turning on small lathes | JS | CCGT03X101-JS | 0.1 | | | ● |
| | | CCGT03X102-JS | 0.2 | | | ● |
| | | CCGT03X104-JS | 0.4 | | | ● |
| | | CCGT04T101-JS | 0.1 | | | ● |
| | | CCGT04T102-JS | 0.2 | | | ● |
| | | CCGT04T104-JS | 0.4 | | | ● |
| For internal turning on small lathes (Sharp edge) | JS | CCGT03X101F-JS | 0.1 | | ● | |
| | | CCGT03X102F-JS | 0.2 | | ● | |
| | | CCGT03X104F-JS | 0.4 | | ● | |
| | | CCGT04T101F-JS | 0.1 | | ● | |
| | | CCGT04T102F-JS | 0.2 | | ● | |
| | | CCGT04T104F-JS | 0.4 | | ● | |
| For external turning on small lathes | JS | CCGT060201N-JS | 0.1 | ● | | |
| | | CCGT060202N-JS | 0.2 | ● | | |
| | | CCGT060204N-JS | 0.4 | ● | | |
| | | CCGT09T301N-JS | 0.1 | ● | | |
| | | CCGT09T302N-JS | 0.2 | ● | | |
| | | CCGT09T304N-JS | 0.4 | ● | | |
| For external turning on small lathes (Sharp edge) | JS | CCGT060200FN-JS | 0.03 | | ● | ● |
| | | CCGT060201FN-JS | 0.1 | | ● | ● |
| | | CCGT060202FN-JS | 0.2 | | ● | ● |
| | | CCGT060204FN-JS | 0.4 | | ● | ● |
| | | CCGT09T300FN-JS | 0.03 | | ● | ● |
| | | CCGT09T301FN-JS | 0.1 | | ● | ● |
| | | CCGT09T302FN-JS | 0.2 | | ● | ● |
| | | CCGT09T304FN-JS | 0.4 | | ● | ● |

● : Line-up


External toolholders → **B245**
Internal toolholders → **B278, B301**
J series toolholders → **B328 - B331**
PINZBOHR® → **F136 - F151**

# TurnLine - Insert

## POSITIVE TYPE



**Rhombic, 80° with hole Positive 7°**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ●ᑕ | ●ᑕ | | | | | ●ᑕ | | | | | ● | | | | | | | | | | | | | | | | | | | | | |
| M | Stainless | ●ᑕ | ●ᑕ | | | | | | | | | | ● | | | | | | | | | | | | | | | | | | | | | |
| K | Cast iron | | | | | | | ●ᑕ | | | | | ● | | | | | | | | | | | | | | | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | ● | | | | | | | | | | | | | | | | | | | | | |
| S | Superalloys | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | Cermet | | | | | Uncoated | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | SH725 | J740 | | | | NS9530 | | | | | TH10 | | | | |
| For external turning on small lathes (Sharp edge) | J10 | CCGT060200FR-J10 | 0.03 | ● | ● | | | | | | | | | ● | | | | |
| | | CCGT060200FL-J10 | 0.03 | ● | ● | | | | | | | | | ● | | | | |
| | | CCGT060201FR-J10 | 0.1 | ● | ● | | | | ● | | | | | ● | | | | |
| | | CCGT060201FL-J10 | 0.1 | ● | ● | | | | | | | | | ● | | | | |
| | | CCGT060202FR-J10 | 0.2 | ● | ● | | | | ● | | | | | ● | | | | |
| | | CCGT060202FL-J10 | 0.2 | ● | ● | | | | ● | | | | | ● | | | | |
| | | CCGT09T300FR-J10 | 0.03 | ● | ● | | | | | | | | | ● | | | | |
| | | CCGT09T300FL-J10 | 0.03 | ● | ● | | | | | | | | | ● | | | | |
| | | CCGT09T301FR-J10 | 0.1 | ● | ● | | | | | | | | | ● | | | | |
| | | CCGT09T301FL-J10 | 0.1 | ● | ● | | | | | | | | | ● | | | | |
| | | CCGT09T302FR-J10 | 0.2 | ● | ● | | | | | | | | | ● | | | | |
| | | CCGT09T302FL-J10 | 0.2 | ● | ● | | | | | | | | | ● | | | | |
| | | CCGT09T304FR-J10 | 0.4 | ● | | | | | | | | | | | | | | |



● : Line-up

External toolholders → **B245**
J series toolholders → **B328 - B331**
Internal toolholders → **B278, B301**
PINZBOHR® → **F136 - F151**

● : Continuous cutting
ɔ : Light interrupted cutting
✣ : Heavy interrupted cutting

## POSITIVE TYPE



**Rhombic, 80° with hole Positive 11°**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ●ɔ | ɔ✣ | ɔ | ✣ | ɔ✣ | ✣ | ●ɔ | ɔ | ɔ | | | | ●ɔ | | | | ●ɔ | | | | | | | | | | |
| M | Stainless | | | ● | ɔ | ɔ | ✣ | ●ɔ | ɔ | ɔ | | | | | | | | | | | | | | | | | | |
| K | Cast iron | ●ɔ | | | | | | ●ɔ | ɔ | ɔ | | | | ●ɔ | | | | ●ɔ | | | | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S | Superalloys | | | | | | | ●ɔ | ● | | | | | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | | | | | | Coated cermet | | | | Cermet | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9115 | T9125 | T6120 | T6130 | AH630 | AH645 | AH120 | AH725 | GH730 | | | GT9530 | | | | NS9530 | | | | | | | | | |
| Finishing | PSF | CPMT060202-PSF | 0.2 | | | | | | | | ● | | | | | | | | | | | | | | | | | |
| | | CPMT060204-PSF | 0.4 | ● | ● | | | | | | ● | | | | | | | | | | | | | | | | | |
| | | CPMT080202-PSF | 0.2 | | | | | | | | ● | | | | | | | | | | | | | | | | | |
| | | CPMT080204-PSF | 0.4 | ● | ● | | | | | | ● | | | | | | | | | | | | | | | | | |
| | | CPMT090302-PSF | 0.2 | | | | | | | | ● | | | | ● | | | | ● | | | | | | | | | |
| | | CPMT090304-PSF | 0.4 | ● | ● | | | | | | ● | | | | ● | | | | ● | | | | | | | | | |
| | | CPMT09T302-PSF | 0.2 | | | | | | | | ● | | | | | | | | | | | | | | | | | |
| | | CPMT09T304-PSF | 0.4 | ● | ● | | | | | | ● | | | | | | | | | | | | | | | | | |
| | PF | CPMT090302-PF | 0.2 | | | | | | | | | | | | ● | | | | ● | | | | | | | | | |
| | | CPMT090304-PF | 0.4 | | | | | | | | | | | | ● | | | | ● | | | | | | | | | |
| Finishing to light cutting | PSS | CPMT060204-PSS | 0.4 | ● | ● | | | | | | ● | | | | ● | | | | ● | | | | | | | | | |
| | | CPMT080204-PSS | 0.4 | ● | ● | ● | ● | ● | ● | | ● | | | | ● | | | | ● | | | | | | | | | |
| | | CPMT080208-PSS | 0.8 | ● | ● | ● | ● | ● | ● | | ● | | | | ● | | | | ● | | | | | | | | | |
| | | CPMT090304-PSS | 0.4 | ● | ● | ● | ● | ● | ● | | ● | | | | ● | | | | ● | | | | | | | | | |
| | | CPMT090308-PSS | 0.8 | ● | ● | ● | ● | ● | ● | | ● | | | | ● | | | | ● | | | | | | | | | |
| | | CPMT09T304-PSS | 0.4 | ● | ● | | | | | | ● | | | | | | | | | | | | | | | | | |
| | | CPMT09T308-PSS | 0.8 | ● | ● | | | | | | ● | | | | | | | | | | | | | | | | | |
| Finishing to medium cutting | PS | CPMT060202-PS | 0.2 | ● | ● | | | | | | ● | ● | | | | | | | ● | | | | | | | | | |
| | | CPMT060204-PS | 0.4 | ● | ● | | | | | ● | ● | ● | | | ● | | | | ● | | | | | | | | | |
| | | CPMT080202-PS | 0.2 | ● | ● | ● | ● | ● | ● | | ● | | | | ● | | | | ● | | | | | | | | | |
| | | CPMT080204-PS | 0.4 | ● | ● | ● | ● | ● | ● | | ● | | | | ● | | | | ● | | | | | | | | | |
| | | CPMT080208-PS | 0.8 | ● | ● | ● | ● | ● | ● | | ● | | | | ● | | | | ● | | | | | | | | | |
| | | CPMT090304-PS | 0.4 | ● | ● | ● | ● | ● | ● | | ● | | | | ● | | | | ● | | | | | | | | | |
| | | CPMT090308-PS | 0.8 | ● | ● | ● | ● | ● | ● | | ● | | | | ● | | | | ● | | | | | | | | | |
| | | CPMT09T302-PS | 0.2 | ● | ● | | | | | | ● | | | | | | | | | | | | | | | | | |
| | | CPMT09T304-PS | 0.4 | ● | ● | | | | | | ● | | | | | | | | | | | | | | | | | |
| | | CPMT09T308-PS | 0.8 | ● | ● | | | | | ● | ● | | | | | | | | | | | | | | | | | |

● : Line-up

Internal toolholders → B280, B301

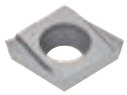
● : Continuous cutting
c : Light interrupted cutting
✣ : Heavy interrupted cutting

## POSITIVE TYPE



**Rhombic, 80° with hole Positive 11°**

| | | Coating | | | Cermet | | | Uncoated | | |
|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | c✣ | | | ●c | | | ● | | |
| M | Stainless | | | | | | | ● | | |
| K | Cast iron | | | | ●c | | | ● | | |
| N | Non-ferrous | | | | | | | ● | | |
| S | Superalloys | | | | | | | | | |
| H | Hard materials | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9125 | | | NS9530 | | | TH10 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Medium cutting | **24** | **CPMT120408-24** | 0.8 | | | | ● | | | | | |
| |  | **CPMT160508-24** | 0.8 | ● | | | ● | | | | | |
| | | **CPMT160512-24** | 1.2 | | | | ● | | | | | |
| Finishing | **W15** | **CPGT050202L-W15** | 0.2 | | | | ● | | | | | |
| |  | **CPGT050204L-W15** | 0.4 | | | | ● | | | | | |
| | | **CPGT080202R-W15** | 0.2 | | | | | | | ● | | |
| | | **CPGT080202L-W15** | 0.2 | | | | ● | | | ● | | |
| | | **CPGT080204R-W15** | 0.4 | | | | | | | ● | | |
| | | **CPGT080204L-W15** | 0.4 | | | | ● | | | ● | | |
| | **W20** | **CPGT090302R-W20** | 0.2 | | | | ● | | | ● | | |
| |  | **CPGT090302L-W20** | 0.2 | | | | ● | | | ● | | |
| | | **CPGT090304R-W20** | 0.4 | | | | ● | | | ● | | |
| | | **CPGT090304L-W20** | 0.4 | | | | ● | | | ● | | |

● : Line-up

Internal toolholders → B280, B301 Cartridges → F152 -
Boring bar tools → F169 - F172

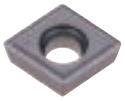
● : Continuous cutting
ᑕ : Light interrupted cutting
✣ : Heavy interrupted cutting

## POSITIVE TYPE



**Rhombic, 80° with hole Positive 11°**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ● | ᑕ | ✣ | ᑕ✣ | ✣ | | | | ᑕ | | | | | | | | | ●ᑕ | | | | | | | | | | | | |
| M | Stainless | | ● | ᑕ | ᑕ | ✣ | | | | ᑕ | ● | ᑕ | | | | | | | | | | | | | | | | | | | |
| K | Cast iron | ●ᑕ | | | | | ●ᑕ | ● | ᑕ | ᑕ | | | | | | | | | ●ᑕ | | | | | | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S | Superalloys | | | | | | | | | ● | ● | ᑕ | ᑕ | | | | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | | | | | | | | | Cermet | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9105 | T9125 | T6120 | T6130 | AH630 | AH645 | T515 | T5115 | AH725 | AH8005 | AH8015 | AH905 | | | NS9530 | | | | | | | | | | | | | |
| Medium cutting | **PM** | **CPMT060204-PM** | 0.4 | | | ● | ● | ● | ● | | | ● | | | | | | | | | | | | | | | | | | | |
| |  | **CPMT060208-PM** | 0.8 | | ● | ● | ● | ● | ● | | | ● | | | | | | | | | | | | | | | | | | | |
| | | **CPMT090304-PM** | 0.4 | | ● | ● | ● | ● | ● | | | ● | | | | | | ● | | | | | | | | | | | | | |
| | | **CPMT090308-PM** | 0.8 | | ● | ● | ● | ● | ● | | | ● | | | | | | ● | | | | | | | | | | | | | |
| Finishing to medium cutting | **CM** | **CPMT060204-CM** | 0.4 | | | | | | | | ● | | | | | | | | | | | | | | | | | | | | |
| |  | **CPMT060208-CM** | 0.8 | | | | | | | | ● | | | | | | | | | | | | | | | | | | | | |
| | | **CPMT080204-CM** | 0.4 | | | | | | | | ● | | | | | | | | | | | | | | | | | | | | |
| | | **CPMT080208-CM** | 0.8 | | | | | | | | ● | | | | | | | | | | | | | | | | | | | | |
| | | **CPMT090304-CM** | 0.4 | | | | | | | ● | ● | | | | | | | | | | | | | | | | | | | | |
| | | **CPMT090308-CM** | 0.8 | | | | | | | ● | ● | | | | | | | | | | | | | | | | | | | | |
| | | **CPMT09T304-CM** | 0.4 | | | | | | | ● | ● | | | | | | | | | | | | | | | | | | | | |
| | | **CPMT09T308-CM** | 0.8 | | | | | | | ● | ● | | | | | | | | | | | | | | | | | | | | |
| | | **CPMT09T312-CM** | 1.2 | | | | | | | | ● | | | | | | | | | | | | | | | | | | | | |
| | | **CPMT120408-CM** | 0.8 | | | | | | | | ● | | | | | | | | | | | | | | | | | | | | |
| | | **CPMT120412-CM** | 1.2 | | | | | | | | ● | | | | | | | | | | | | | | | | | | | | |
| Medium cutting | **All-round** | **CPMT120408** | 0.8 | | | | | | | | | | ● | ● | ● | | | | | | | | | | | | | | | | |
| |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | **-** | **CPMW080204** | 0.4 | | | | | | | | ● | | | | | | | | | | | | | | | | | | | | |
| | | **CPMW080208** | 0.8 | | | | | | | | ● | | | | | | | | | | | | | | | | | | | | |
| |  | **CPMW090304** | 0.4 | ● | | | | | | | ● | | | | | | | | | | | | | | | | | | | | |
| | | **CPMW090308** | 0.8 | | | | | | | | ● | | | | | | | | | | | | | | | | | | | | |

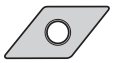
● : Line-up

Internal toolholders → B280, B301
Boring bar tools → F169 - F172

# TurnLine - Insert

● : Continuous cutting
c : Light interrupted cutting
✣ : Heavy interrupted cutting

## POSITIVE TYPE



**Rhombic, 55° with hole Positive 7°**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ●c | c✣ | c | | | | c | ●c | ●c | | | | ●c | ●c | | | | ●c | | | | | | | | | | | | |
| M | Stainless | | | c | ● | c | | c | ●c | ●c | | | | | | | | | | | | | | | | | | | | | |
| K | Cast iron | ●c | | c | | | | c | | | | | | ●c | ●c | | | | ●c | | | | | | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S | Superalloys | | | ● | ● | c | c | | | | | | | | | | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

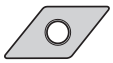
| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | | | | | | Coated cermet | | | | Cermet | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9115 | T9125 | AH725 | AH8005 | AH8015 | AH905 | GH730 | SH725 | J740 | | GT9530 | J9530 | | | NS9530 | | | | | | | | | | | | | |
| Precision finishing | 01 | DCGT070202-01 | 0.2 | | | | | | | | | ● | | | ● | | | | | | | | | | | | | | | | |
| | | DCGT11T302-01 | 0.2 | | | | | | | | | ● | | | | | | | | | | | | | | | | | | | |
| | |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Precision finishing (Sharp edgeds) | 01 | DCGT070202F-01 | 0.2 | | | | | | | | ● | | | | | | | | | | | | | | | | | | | | |
| | | DCGT11T302F-01 | 0.2 | | | | | | | | ● | | | | | | | | | | | | | | | | | | | | |
| | |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Finishing | PSF | DCMT070202-PSF | 0.2 | | | ● | | | | | | | | ● | | | | ● | | | | | | | | | | | | | |
| | | DCMT070204-PSF | 0.4 | ● | ● | ● | | | | | | | | ● | | | | ● | | | | | | | | | | | | | |
| | | DCMT11T302-PSF | 0.2 | | | ● | | | | | | | | ● | | | | ● | | | | | | | | | | | | | |
| | | DCMT11T304-PSF | 0.4 | ● | ● | ● | ● | ● | ● | | | | | ● | | | | ● | | | | | | | | | | | | | |
| | | DCMT11T308-PSF | 0.8 | ● | ● | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | |
| | |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | PF | DCMT070202-PF | 0.2 | | | | | | | ● | | | | ● | | | | ● | | | | | | | | | | | | | |
| | | DCMT070204-PF | 0.4 | | | | | | | ● | | | | ● | | | | ● | | | | | | | | | | | | | |
| | | DCMT070208-PF | 0.8 | | | | | | | | | | | ● | | | | ● | | | | | | | | | | | | | |
| | | DCMT11T302-PF | 0.2 | | | | | | | ● | | | | ● | | | | ● | | | | | | | | | | | | | |
| | | DCMT11T304-PF | 0.4 | | | | | | | ● | | | | ● | | | | ● | | | | | | | | | | | | | |
| | | DCMT11T308-PF | 0.8 | | | | | | | | | | | ● | | | | | | | | | | | | | | | | | |
| | |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

● : Line-up

External toolholders → B217 -
Internal toolholders → B287 -
J series toolholders → B331 - 335

● : Continuous cutting
◐ : Light interrupted cutting
✣ : Heavy interrupted cutting

## POSITIVE TYPE



**Rhombic, 55° with hole Positive 7°**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ●◐ | ◐✣ | ◐ | ✣ | ◐✣ | ✣ | ●◐ | ◐ | | | | ◐ | | | | ●◐ | | | | ●◐ | | | | | | | |
| M | Stainless | | | ● | ◐ | ◐ | ✣ | ●◐ | ◐ | ● | ◐ | | ◐ | | | | | | | | | | | | | | | |
| K | Cast iron | ●◐ | | | | | | ●◐ | ◐ | | | | ◐ | | | | ●◐ | | | | ●◐ | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S | Superalloys | | | | | | | ●◐ | ● | ● | ◐ | ◐ | | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | | | |

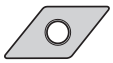
| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | | | | | | | | | | Coated cermet | | | | Cermet | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9115 | T9125 | T6120 | T6130 | AH630 | AH645 | AH120 | AH725 | AH8005 | AH8015 | AH905 | GH730 | | | GT9530 | | | | NS9530 | | | | | | | |
| Finishing to light cutting | **PSS** | **DCMT070204-PSS** | 0.4 | ● | ● | ● | ● | ● | ● | | ● | | | | | | | ● | | | | ● | | | | | | | |
| |  | **DCMT070208-PSS** | 0.8 | ● | ● | ● | ● | ● | ● | | ● | | | | | | | ● | | | | ● | | | | | | | |
| | | **DCMT11T304-PSS** | 0.4 | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | | | | ● | | | | ● | | | | | | | |
| | | **DCMT11T308-PSS** | 0.8 | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | | | | ● | | | | ● | | | | | | | |
| | | **DCMT11T312-PSS** | 1.2 | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | | | | | | | | | | | | | | | |
| Finishing to medium cutting | **PS** | **DCMT070202-PS** | 0.2 | ● | ● | ● | ● | ● | ● | ● | ● | | | | ● | | | ● | | | | ● | | | | | | | |
| |  | **DCMT070204-PS** | 0.4 | ● | ● | ● | ● | ● | ● | ● | ● | | | | ● | | | ● | | | | ● | | | | | | | |
| | | **DCMT070208-PS** | 0.8 | ● | ● | | | | | | ● | | | | ● | | | ● | | | | ● | | | | | | | |
| | | **DCMT11T302-PS** | 0.2 | ● | ● | ● | ● | ● | ● | ● | ● | | | | ● | | | ● | | | | ● | | | | | | | |
| | | **DCMT11T304-PS** | 0.4 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | ● | | | | ● | | | | | | | |
| | | **DCMT11T308-PS** | 0.8 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | ● | | | | ● | | | | | | | |
| | | **DCMT11T312-PS** | 1.2 | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | | | | | | | | | | | | | | | |
| | **23** | **DCMT070204-23** | 0.4 | | | | | | | | | | | | | | | | | | | ● | | | | | | | |
| |  | **DCMT11T304-23** | 0.4 | | | | | | | | | | | | | | | | | | | ● | | | | | | | |
| | | **DCMT11T308-23** | 0.8 | | | | | | | | | | | | | | | | | | | ● | | | | | | | |
| Medium cutting | **24** | **DCMT070202-24** | 0.2 | | | | | | | | | | | | | | | | | | | ● | | | | | | | |
| |  | **DCMT070204-24** | 0.4 | ● | ● | | | | | | | | | | | | | | | | | ● | | | | | | | |
| | | **DCMT070208-24** | 0.8 | | ● | | | | | | | | | | | | | | | | | ● | | | | | | | |
| | | **DCMT11T302-24** | 0.2 | | ● | | | | | | | | | | | | | | | | | ● | | | | | | | |
| | | **DCMT11T304-24** | 0.4 | ● | ● | | | | | | | | | | | | | | | | | ● | | | | | | | |
| | | **DCMT11T308-24** | 0.8 | ● | ● | | ● | | | | | | | | | | | | | | | ● | | | | | | | |

● : Line-up

External toolholders → **B217 -**
Internal toolholders → **B287 -**
J series toolholders → **B331 - 335**

● : Continuous cutting
ɔ : Light interrupted cutting
✣ : Heavy interrupted cutting

## POSITIVE TYPE



**Rhombic, 55° with hole Positive 7°**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ●ɔ | ɔ✣ | ɔ | ✣ | ɔ✣ | ✣ | | | ●ɔ | ɔ | ●ɔ | ɔ | | ●ɔ | | | | ●ɔ | | | | ● | | | | |
| M | Stainless | | | ● | ɔ | ɔ | ✣ | | | ●ɔ | ɔ | ●ɔ | ɔ | | | | | | | | | | ● | | | | |
| K | Cast iron | ●ɔ | | | | | | ●ɔ | ɔ | ●ɔ | ɔ | ●ɔ | ɔ | | ●ɔ | | | | ●ɔ | | | | ● | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | | | | | ● | | | | |
| S | Superalloys | | | | | | | | | ●ɔ | ● | | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | | |

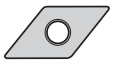
| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | | | | | | | | Coated cermet | | | | Cermet | | | | Uncoated | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9115 | T9125 | T6120 | T6130 | AH630 | AH645 | T515 | T5115 | AH120 | AH725 | GH330 | GH730 | GT9530 | | | | NS9530 | | | | TH10 | | | |
| Finishing | W10 | DCGT070200R-W10 | 0.03 | | | | | | | | | | | | | | | | | | | | | ● | | | |
| | | DCGT070200L-W10 | 0.03 | | | | | | | | | | | | | | | | | | | | | ● | | | |
| | | DCGT070202R-W10 | 0.2 | | | | | | | | | | | | | | | | | ● | | | | ● | | | |
| | | DCGT070202L-W10 | 0.2 | | | | | | | | | | | | | ● | | | | ● | | | | | | | |
| | | DCGT070204R-W10 | 0.4 | | | | | | | | | | | ● | | | | | | ● | | | | ● | | | |
| | | DCGT070204L-W10 | 0.4 | | | | | | | | | | | ● | | ● | | | | ● | | | | ● | | | |
| | W15 | DCGT11T302R-W15 | 0.2 | | | | | | | | | | | | | | | | | ● | | | | ● | | | |
| | | DCGT11T302L-W15 | 0.2 | | | | | | | | | | | | | ● | | | | ● | | | | | | | |
| | | DCGT11T304R-W15 | 0.4 | | | | | | | | | | | | | | | | | ● | | | | | | | |
| | | DCGT11T304L-W15 | 0.4 | | | | | | | | | | | ● | | ● | | | | ● | | | | ● | | | |
| | | DCGT11T308R-W15 | 0.8 | | | | | | | | | | | | | | | | | ● | | | | ● | | | |
| | | DCGT11T308L-W15 | 0.8 | | | | | | | | | | | | | | | | | ● | | | | ● | | | |
| Medium cutting | PM | DCMT070204-PM | 0.4 | ● | ● | ● | ● | ● | ● | | | ● | ● | | ● | ● | | | | ● | | | | | | | |
| | | DCMT070208-PM | 0.8 | ● | ● | ● | ● | ● | ● | | | ● | ● | | ● | ● | | | | ● | | | | | | | |
| | | DCMT11T304-PM | 0.4 | ● | ● | ● | ● | ● | ● | | | ● | ● | | ● | ● | | | | ● | | | | | | | |
| | | DCMT11T308-PM | 0.8 | ● | ● | ● | ● | ● | ● | | | ● | ● | | ● | ● | | | | ● | | | | | | | |
| | | DCMT11T312-PM | 1.2 | | ● | ● | ● | ● | ● | | | | ● | | | | | | | | | | | | | | |
| Finishing to medium cutting | CM | DCMT070204-CM | 0.4 | | | | | | | | ● | | | | | | | | | | | | | | | | |
| | | DCMT070208-CM | 0.8 | | | | | | | | ● | | | | | | | | | | | | | | | | |
| | | DCMT11T304-CM | 0.4 | | | | | | | ● | ● | | | | | | | | | | | | | | | | |
| | | DCMT11T308-CM | 0.8 | | | | | | | ● | ● | | | | | | | | | | | | | | | | |
| | | DCMT11T312-CM | 1.2 | | | | | | | | ● | | | | | | | | | | | | | | | | |

● : Line-up

External toolholders → B217 - Internal toolholders → B287 -
J series toolholders → B331 - 335

● : Continuous cutting
ɔ : Light interrupted cutting
✣ : Heavy interrupted cutting

## POSITIVE TYPE



**Rhombic, 55° with hole Positive 7°**

| | | T9105 | T5115 | GH110 | NS9530 | TH10 | KS05F |
|---|---|---|---|---|---|---|---|
| P | Steel | ● | | ● | ●ɔ | ● | |
| M | Stainless | | | ● | | ● | |
| K | Cast iron | ●ɔ | ɔ | ● | ●ɔ | ● | ● |
| N | Non-ferrous | | | | | ● | ● |
| S | Superalloys | | | ● | | | ● |
| H | Hard materials | | | | | | |

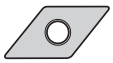
| Application | Chipbreaker | Designation | Corner radius | Coating | | | Cermet | Uncoated | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | T9105 | T5115 | GH110 | NS9530 | TH10 | KS05F |
| Finishing to medium cutting | **AL** | **DCGT070202-AL** | 0.2 | | | | | | ● |
| | | **DCGT070204-AL** | 0.4 | | | | | | ● |
| | | **DCGT11T302-AL** | 0.2 | | | | | | ● |
| | | **DCGT11T304-AL** | 0.4 | | | | | | ● |
| | | **DCGT11T308-AL** | 0.8 | | | | | | ● |
| | **All-round** | **DCGT070202** | 0.2 | | | | ● | | |
| | | **DCGT070204** | 0.4 | | | | ● | | |
| | | **DCGT11T302** | 0.2 | | | | ● | | |
| | | **DCGT11T304** | 0.4 | | | | ● | | |
| | | **DCGT11T308** | 0.8 | | | | ● | | |
| | **Angular** | **DCGT070202R** | 0.2 | | | | | ● | |
| | | **DCGT070202L** | 0.2 | | | | | ● | |
| | | **DCGT070204R** | 0.4 | | | | | ● | |
| | | **DCGT070204L** | 0.4 | | | | | ● | |
| | | **DCGT11T302R** | 0.2 | | | | | ● | |
| | | **DCGT11T302L** | 0.2 | | | | | ● | |
| | | **DCGT11T304R** | 0.4 | | | | | ● | |
| | | **DCGT11T304L** | 0.4 | | | | | ● | |
| Medium cutting | **-** | **DCMW070204** | 0.4 | ● | ● | | | | |
| | | **DCMW070208** | 0.8 | | ● | | | | |
| | | **DCMW11T304** | 0.4 | ● | ● | | | | |
| | | **DCMW11T308** | 0.8 | | ● | | | | |
| | **-** | **DCGW070202** | 0.2 | | | | | ● | |
| | | **DCGW070204** | 0.4 | | | ● | | ● | |
| | | **DCGW11T304** | 0.4 | | | | | ● | |
| | | **DCGW11T308** | 0.8 | | | | | ● | |

● : Line-up

External toolholders → **B217 -**
Internal toolholders → **B287 -**
J series toolholders → **B331 - 335**

● : Continuous cutting
ɔ : Light interrupted cutting
✣ : Heavy interrupted cutting

## POSITIVE TYPE



**Rhombic, 55° with hole Positive 7°**

| | | | | |
|---|---|---|---|---|
| P | Steel | ɔ | ●ɔ | ●ɔ |
| M | Stainless | ɔ | ●ɔ | ●ɔ |
| K | Cast iron | ɔ | | |
| N | Non-ferrous | | | |
| S | Superalloys | ● | | ●ɔ |
| H | Hard materials | | | |

| Application | Chipbreaker | Designation | Corner radius | Coating AH725 | Coating SH725 | Coating SH730 |
|---|---|---|---|---|---|---|
| For external turning on small lathes (Sharp edge) | JS | DCGT070200FN-JS | 0.03 | | ● | ● |
| | | DCGT070201FN-JS | 0.1 | | ● | ● |
| | | DCGT070202FN-JS | 0.2 | | ● | ● |
| | | DCGT11T300FN-JS | 0.03 | | ● | ● |
| | | DCGT11T301FN-JS | 0.1 | | ● | ● |
| | | DCGT11T302FN-JS | 0.2 | | ● | ● |
| | | DCGT11T304FN-JS | 0.4 | | ● | ● |
| For external turning on small lathes | JS | DCGT070201N-JS | 0.1 | ● | | |
| | | DCGT070202N-JS | 0.2 | ● | | |
| | | DCGT11T301N-JS | 0.1 | ● | | |
| | | DCGT11T302N-JS | 0.2 | ● | | |
| | | DCGT11T304N-JS | 0.4 | ● | | |
| For external turning on small lathes (Sharp edge) | JPP | DCET0702008MFR-JPP | <0.08* | | ● | ● |
| | | DCET0702008MFL-JPP | <0.08* | | ● | ● |
| | | DCET070201MFR-JPP | <0.1* | | ● | ● |
| | | DCET070201MFL-JPP | <0.1* | | ● | ● |
| | | DCET0702018MFR-JPP | <0.18* | | ● | ● |
| | | DCET0702018MFL-JPP | <0.18* | | ● | ● |
| | | DCET070202MFR-JPP | <0.2* | | ● | ● |
| | | DCET070202MFL-JPP | <0.2* | | ● | ● |
| | | DCET11T3008MFR-JPP | <0.08* | | ● | ● |
| | | DCET11T3008MFL-JPP | <0.08* | | ● | ● |
| | | DCET11T301MFR-JPP | <0.1* | | ● | ● |
| | | DCET11T301MFL-JPP | <0.1* | | ● | ● |
| | | DCET11T3018MFR-JPP | <0.18* | | ● | ● |
| | | DCET11T3018MFL-JPP | <0.18* | | ● | ● |
| | | DCET11T302MFR-JPP | <0.2* | | ● | ● |
| | | DCET11T302MFL-JPP | <0.2* | | ● | ● |

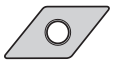
* Corner radius has minus tolerance.

● : Line-up

External toolholders → B217 - Internal toolholders → B287 -
J series toolholders → B331 - 335

● : Continuous cutting
ⓒ : Light interrupted cutting
✣ : Heavy interrupted cutting

## POSITIVE TYPE



**Rhombic, 55° with hole Positive 7°**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ●ⓒ | | ●ⓒ | | ●ⓒ | | | | | | ●ⓒ | | | | | ●ⓒ | | | | | ● | | | | | | | | | | | | |
| M | Stainless | ●ⓒ | | ●ⓒ | | ●ⓒ | | | | | | | | | | | | | | | | ● | | | | | | | | | | | | |
| K | Cast iron | | | | | | | | | | | ●ⓒ | | | | | ●ⓒ | | | | | ● | | | | | | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | | | | ● | | | | | | | | | | | | |
| S | Superalloys | | | ●ⓒ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | | Coated cermet | | | | | | Cermet | | | | | | Uncoated | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | SH725 | | SH730 | | J740 | | J9530 | | | | | | NS9530 | | | | | | TH10 | | | | | | | | | | | | |
| For external turning on small lathes (Sharp edge) | JRP | DCET0702008MFR-JRP | <0.08* | ● | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | DCET0702008MFL-JRP | <0.08* | ● | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | DCET070201MFR-JRP | <0.1* | ● | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | DCET070201MFL-JRP | <0.1* | ● | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | DCET0702018MFR-JRP | <0.18* | ● | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | DCET0702018MFL-JRP | <0.18* | ● | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | DCET070202MFR-JRP | <0.2* | ● | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | DCET070202MFL-JRP | <0.2* | ● | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | DCET11T3008MFR-JRP | <0.08* | ● | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | DCET11T3008MFL-JRP | <0.08* | ● | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | DCET11T301MFR-JRP | <0.1* | ● | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | DCET11T301MFL-JRP | <0.1* | ● | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | DCET11T3018MFR-JRP | <0.18* | ● | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | DCET11T3018MFL-JRP | <0.18* | ● | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | DCET11T302MFR-JRP | <0.2* | ● | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | DCET11T302MFL-JRP | <0.2* | ● | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | JSP | DCET0702008MFN-JSP | <0.08* | ● | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | DCET070201MFN-JSP | <0.1* | ● | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | DCET0702018MFN-JSP | <0.18* | ● | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | DCET070202MFN-JSP | <0.2* | ● | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | DCET11T3008MFN-JSP | <0.08* | ● | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | DCET11T301MFN-JSP | <0.1* | ● | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | DCET11T3018MFN-JSP | <0.18* | ● | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | DCET11T302MFN-JSP | <0.2* | ● | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | J10 | DCGT070200FR-J10 | 0.03 | ● | | | | ● | | | | | | | | | | | | | | | | ● | | | | | | | | | | |
| | | DCGT070200FL-J10 | 0.03 | ● | | | | ● | | | | | | | | | | | | | | | | ● | | | | | | | | | | |
| | | DCGT070201FR-J10 | 0.1 | ● | | | | ● | | | | | | | | | | ● | | | | | | ● | | | | | | | | | | |
| | | DCGT070201FL-J10 | 0.1 | ● | | | | ● | | | | | | | | | | ● | | | | | | ● | | | | | | | | | | |
| | | DCGT070202FR-J10 | 0.2 | ● | | | | ● | | | | | | | | | | ● | | | | | | ● | | | | | | | | | | |
| | | DCGT070202FL-J10 | 0.2 | ● | | | | ● | | | | | | | | | | ● | | | | | | ● | | | | | | | | | | |
| | | DCGT070204FR-J10 | 0.4 | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | DCGT070204FL-J10 | 0.4 | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | DCGT11T300FR-J10 | 0.03 | ● | | | | ● | | | | | | | | | | | | | | | | ● | | | | | | | | | | |
| | | DCGT11T300FL-J10 | 0.03 | ● | | | | ● | | | | | | | | | | | | | | | | ● | | | | | | | | | | |
| | | DCGT11T301FR-J10 | 0.1 | ● | | | | ● | | | | | | | | | | ● | | | | | | ● | | | | | | | | | | |
| | | DCGT11T301FL-J10 | 0.1 | ● | | | | ● | | | | | | | | | | ● | | | | | | ● | | | | | | | | | | |
| | | DCGT11T302FR-J10 | 0.2 | ● | | | | ● | | | | | | | | | | ● | | | | | | ● | | | | | | | | | | |
| | | DCGT11T302FL-J10 | 0.2 | ● | | | | ● | | | | | | | | | | ● | | | | | | ● | | | | | | | | | | |
| On small lathes (Honed edge) | J10 | DCGT070202R-J10 | 0.2 | | | | | | | ● | | | | | | | | | | | | | | | | | | | | | | | | |
| | | DCGT11T302R-J10 | 0.2 | | | | | | | ● | | | | | | | | | | | | | | | | | | | | | | | | |

* Corner radius has minus tolerance.

● : Line-up

● : Continuous cutting
ɔ : Light interrupted cutting
✣ : Heavy interrupted cutting

## POSITIVE TYPE



**Rhombic, 75° with hole Positive 11°**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ● | ɔ | ● | ɔ | ● | ɔ | | | | | ● | ɔ | | | | | ● | ɔ | | | | | ● | ɔ | | | | | | |
| M | Stainless | ● | ɔ | ● | ɔ | ● | ɔ | | | | | | | | | | | | | | | | | ● | ɔ | | | | | | |
| K | Cast iron | ● | | | | | | | | | | ● | ɔ | | | | | ● | ɔ | | | | | ● | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | | | | | | ● | | | | | | | |
| S | Superalloys | ● | | ● | ɔ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | | Coated cermet | | | | | | Cermet | | | | | | Uncoated | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | GH110 | | SH725 | | SH730 | | GT9530 | | | | | | NS9530 | | | | | | TH10 | | UX30 | | | | | | | |
| Finishing | W08 | EPGT03X100R-W08 | 0.03 | | | | | ● | | | | | | | | | | | | | | ● | | | | | | | | | |
| | | EPGT03X100L-W08 | 0.03 | | | | | ● | | | | | | | | | | | | | | ● | | | | | | | | | |
| | | EPGT03X101R-W08 | 0.1 | | | | | ● | | | | | | | | | | | | | | ● | | | | | | | | | |
| | | EPGT03X101L-W08 | 0.1 | | | | | ● | | | | | | | | | | | | | | ● | | | | | | | | | |
| | | EPGT03X102R-W08 | 0.2 | | | | | ● | | | | | | | | | | | | | | ● | | | | | | | | | |
| | | EPGT03X102L-W08 | 0.2 | | | | | ● | | | | | | | | | | | | | | ● | | | | | | | | | |
| | | EPGT03X104R-W08 | 0.4 | | | | | ● | | | | | | | | | | | | | | ● | | | | | | | | | |
| | | EPGT03X104L-W08 | 0.4 | | | | | ● | | | | | | | | | | | | | | ● | | | | | | | | | |
| | | EPGT040100R-W08 | 0.03 | | | | | ● | | | | | | | | | | | | | | ● | | | | | | | | | |
| | | EPGT040100L-W08 | 0.03 | ● | | | | ● | | | | | | | | ● | | | | | | ● | | | | | | | | | |
| | | EPGT040101R-W08 | 0.1 | | | | | ● | | | | | | | | | | | | | | ● | | | | | | | | | |
| | | EPGT040101L-W08 | 0.1 | | | | | ● | | | | | | | | | | | | | | ● | | | | | | | | | |
| | | EPGT040102R-W08 | 0.2 | ● | | | | ● | | | | | | | | ● | | | | | | ● | | | | | | | | | |
| | | EPGT040102L-W08 | 0.2 | ● | | | | ● | | | | ● | | | | ● | | | | | | ● | | ● | | | | | | | |
| | | EPGT040104R-W08 | 0.4 | ● | | | | ● | | | | | | | | ● | | | | | | ● | | | | | | | | | |
| | | EPGT040104L-W08 | 0.4 | ● | | | | ● | | | | ● | | | | ● | | | | | | ● | | ● | | | | | | | |
| Finishing (Sharp edge) | W08 | EPGT03X100FL-W08 | 0.03 | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | EPGT03X100FR-W08 | 0.03 | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | EPGT03X101FL-W08 | 0.1 | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | EPGT03X101FR-W08 | 0.1 | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | EPGT03X102FL-W08 | 0.2 | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | EPGT03X102FR-W08 | 0.2 | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | EPGT03X104FL-W08 | 0.4 | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | EPGT03X104FR-W08 | 0.4 | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | EPGT040100FL-W08 | 0.03 | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | EPGT040100FR-W08 | 0.03 | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | EPGT040101FL-W08 | 0.1 | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | EPGT040101FR-W08 | 0.1 | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | EPGT040102FL-W08 | 0.2 | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | EPGT040102FR-W08 | 0.2 | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | EPGT040104FL-W08 | 0.4 | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | EPGT040104FR-W08 | 0.4 | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | |

● : Line-up

Internal toolholders → B279 - Boring bar tools → F169 - F172
Top-borer tools → F173 -

● : Continuous cutting
ⓒ : Light interrupted cutting
✣ : Heavy interrupted cutting

## POSITIVE TYPE



**Rhombic, 75° with hole Positive 11°**

| | | |
|---|---|---|
| P | Steel | ●ⓒ●ⓒ●ⓒ |
| M | Stainless | ●ⓒ●ⓒ●ⓒ |
| K | Cast iron | |
| N | Non-ferrous | |
| S | Superalloys | ●ⓒ |
| H | Hard materials | |

| Application | Chipbreaker | Designation | Corner radius | Coating SH725 | Coating SH730 | Coating J740 |
|---|---|---|---|---|---|---|
| For internal turning on small lathes | JS | EPGT03X101-JS | 0.1 | | ● | |
| | | EPGT03X102-JS | 0.2 | | ● | |
| | | EPGT03X104-JS | 0.4 | | ● | |
| | | EPGT040101-JS | 0.1 | | ● | |
| | | EPGT040102-JS | 0.2 | | ● | |
| | | EPGT040104-JS | 0.4 | | ● | |
| For internal turning on small lathes (Sharp edge) | JS | EPGT03X101F-JS | 0.1 | ● | | |
| | | EPGT03X102F-JS | 0.2 | ● | | |
| | | EPGT03X104F-JS | 0.4 | ● | | |
| | | EPGT040101F-JS | 0.1 | ● | | |
| | | EPGT040102F-JS | 0.2 | ● | | |
| | | EPGT040104F-JS | 0.4 | ● | | |
| Finishing | J08 | EPGT040100L-J08 | 0.03 | | ● | ● |
| | | EPGT040102L-J08 | 0.2 | | ● | ● |
| | | EPGT040104L-J08 | 0.4 | | ● | ● |
| Finishing (Sharp edge) | J08 | EPGT040100FL-J08 | 0.03 | ● | | |
| | | EPGT040102FL-J08 | 0.2 | ● | | |
| | | EPGT040104FL-J08 | 0.4 | ● | | |

● : Line-up

Internal toolholders → B279 - Boring bar tools → F169 - F172
Top-borer tools → F173 -

● : Continuous cutting
◐ : Light interrupted cutting
✣ : Heavy interrupted cutting

## POSITIVE TYPE



**Square, 90° with hole Positive 7°**

| | | |
|---|---|---|
| P | Steel | ●◐ ◐✣ ◐ ✣ ◐✣ ✣ ●◐ ◐ |
| M | Stainless | ● ◐ ◐ ✣ ●◐ ◐ |
| K | Cast iron | ●◐ ●◐ ◐ ●◐ ◐ ●◐ ●◐ |
| N | Non-ferrous | |
| S | Superalloys | ●◐ ● |
| H | Hard materials | |

| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | | | | | | Coated cermet | | | | Cermet | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9115 | T9125 | T6120 | T6130 | AH630 | AH645 | T515 | T5115 | AH120 | AH725 | | | | | GT9530 | | | | NS9530 | | | |
| Finishing to medium cutting | PS | SCMT09T304-PS | 0.4 | ● | ● | ● | ● | ● | ● | | | | ● | | | | | ● | | | | ● | | | |
| | | SCMT09T308-PS | 0.8 | ● | ● | ● | ● | ● | ● | | | | ● | | | | | ● | | | | ● | | | |
| | | SCMT120404-PS | 0.4 | ● | ● | ● | ● | ● | ● | | | | ● | | | | | | | | | ● | | | |
| | | SCMT120408-PS | 0.8 | ● | ● | ● | ● | ● | ● | | | | ● | | | | | | | | | ● | | | |
| | 23 | SCMT09T302-23 | 0.2 | | | | | | | | | | | | | | | | | | | ● | | | |
| | | SCMT09T308-23 | 0.8 | | ● | | | | | | | ● | | | | | | | | | | | | | |
| | | SCMT120408-23 | 0.8 | | ● | | | | | | | ● | ● | | | | | | | | | | | | |
| Medium cutting | 24 | SCMT070204-24 | 0.4 | | ● | | | | | | | | | | | | | | | | | ● | | | |
| | | SCMT09T302-24 | 0.2 | | | | | | | | | | | | | | | | | | | ● | | | |
| | | SCMT09T304-24 | 0.4 | | ● | | | | | | | | | | | | | | | | | ● | | | |
| | | SCMT09T308-24 | 0.8 | ● | ● | | | | | | | | | | | | | | | | | ● | | | |
| | | SCMT120404-24 | 0.4 | | ● | | | | | | | | | | | | | | | | | ● | | | |
| | | SCMT120408-24 | 0.8 | | ● | | | | | | | | | | | | | | | | | ● | | | |
| | PM | SCMT09T304-PM | 0.4 | ● | ● | ● | ● | ● | ● | | | | ● | | | | | | | | | ● | | | |
| | | SCMT09T308-PM | 0.8 | ● | ● | ● | ● | ● | ● | | | | ● | | | | | | | | | ● | | | |
| | | SCMT120408-PM | 0.8 | ● | ● | ● | ● | ● | ● | | | | ● | | | | | | | | | ● | | | |
| | | SCMT120412-PM | 1.2 | | ● | ● | ● | ● | ● | | | | ● | | | | | | | | | ● | | | |
| Finishing to medium cutting | CM | SCMT09T304-CM | 0.4 | | | | | | | ● | ● | | | | | | | | | | | | | | |
| | | SCMT09T308-CM | 0.8 | | | | | | | ● | ● | | | | | | | | | | | | | | |
| | | SCMT09T312-CM | 1.2 | | | | | | | | ● | | | | | | | | | | | | | | |
| | | SCMT120404-CM | 0.4 | | | | | | | ● | ● | | | | | | | | | | | | | | |
| | | SCMT120408-CM | 0.8 | | | | | | | ● | ● | | | | | | | | | | | | | | |

● : Line-up

External toolholders → B249

● : Continuous cutting
c : Light interrupted cutting
✣ : Heavy interrupted cutting

## POSITIVE TYPE



**Square, 90° with hole Positive 11°**

| | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ●c | c✣ | c | ✣ | c✣ | ✣ | ●c | c | | | | ●c | | | | ●c | | | | ● | | | |
| M | Stainless | | | ● | c | c | ✣ | ●c | c | | | | | | | | | | | | ● | | | |
| K | Cast iron | ●c | | | | | | ●c | c | | | | ●c | | | | ●c | | | | ● | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | | | ● | | | |
| S | Superalloys | | | | | | | ●c | ● | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | | | | | | Coated cermet | | | Cermet | | | Uncoated | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9115 | T9125 | T6120 | T6130 | AH630 | AH645 | AH120 | AH725 | | | GT9530 | | | NS9530 | | | TH10 | | | | |
| Finishing to medium cutting | **PS** | **SPMT090304-PS** | 0.4 | ● | ● | ● | ● | ● | ● | | ● | | | ● | | | ● | | | | | | | |
| |  | **SPMT090308-PS** | 0.8 | ● | ● | ● | ● | ● | ● | | ● | | | ● | | | ● | | | | | | | |
| | | **SPMT120404-PS** | 0.4 | ● | ● | ● | ● | ● | ● | | ● | | | | | | | | | | | | | |
| | | **SPMT120408-PS** | 0.8 | ● | ● | ● | ● | ● | ● | | ● | | | | | | | | | | | | | |
| | **23** | **SPMT090304-23** | 0.4 | | ● | | | | | | | | | | | | ● | | | | | | | |
| |  | **SPMT090308-23** | 0.8 | | ● | | | | | | | | | | | | ● | | | | | | | |
| Medium cutting | **24** | **SPMT090304-24** | 0.4 | | ● | | | | | | | | | | | | ● | | | | | | | |
| |  | **SPMT090308-24** | 0.8 | | ● | | | | | ● | | | | | | | ● | | | | | | | |
| | | **SPMT120404-24** | 0.4 | | | | | | | | | | | | | | ● | | | | | | | |
| | | **SPMT120408-24** | 0.8 | | | | | | | | | | | | | | ● | | | | | | | |
| Finishing | **W15** | **SPGT090302L-W15** | 0.2 | | | | | | | | | | | | | | ● | | | | | | | |
| |  | **SPGT090304L-W15** | 0.4 | | | | | | | | | | | | | | ● | | | ● | | | | |
| | | **SPGT090308R-W15** | 0.8 | | | | | | | | | | | | | | | | | ● | | | | |
| | | **SPGT090308L-W15** | 0.8 | | | | | | | | | | | | | | ● | | | ● | | | | |
| | **W20** | **SPGT120404L-W20** | 0.4 | | | | | | | | | | | | | | ● | | | | | | | |
| |  | | | | | | | | | | | | | | | | | | | | | | | |

● : Line-up

External toolholders → **B242 -** Internal toolholders → **B282, B305**
Cartridges → **F152 - F172**

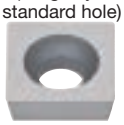
# TurnLine - Insert

## POSITIVE TYPE



**Square, 90° with hole Positive 11°**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | | | | | | | | ●ɔ | | | | ● | | | | | | | | | | | | | | | | | | |
| M | Stainless | | | | | | | | | | | | ● | | | | | | | | | | | | | | | | | | |
| K | Cast iron | ●ɔ | ɔ | | | | | | ●ɔ | | | | ● | | | | | | | | | | | | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | ● | | | | | | | | | | | | | | | | | | |
| S | Superalloys | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

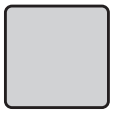
| Application | Chipbreaker | Designation | Corner radius | Coating T515 | Coating T5115 | Cermet NS9530 | Uncoated TH10 |
|---|---|---|---|---|---|---|---|
| Finishing to medium cutting | CM | SPMT090304-CM | 0.4 | | ● | | |
| |  | SPMT090308-CM | 0.8 | | ● | | |
| | | SPMT120404-CM | 0.4 | ● | ● | | |
| | | SPMT120408-CM | 0.8 | ● | ● | | |
| | - | SPGM090304L | 0.4 | | | ● | |
| | (Tungaloy's standard hole) | SPGM120304L | 0.4 | | | ● | |
| |  | SPGM120308L | 0.8 | | | ● | |
| | - | SPMW090304 | 0.4 | | ● | | |
| |  | SPMW090308 | 0.8 | | ● | | |
| | | SPMW120404 | 0.4 | | ● | | |
| | | SPMW120408 | 0.8 | | ● | | |
| | - | SPGW090302 | 0.2 | | | | ● |
| |  | SPGW090304 | 0.4 | | | | ● |
| | | SPGW120404 | 0.4 | | | | ● |
| | - | SPGA090304 | 0.4 | | | ● | |
| | (Tungaloy's standard hole) | | | | | | |
| |  | | | | | | |

● : Line-up

External toolholders → B242 - Internal toolholders → B282, B305
Cartridges → F152 -

● : Continuous cutting
ɔ : Light interrupted cutting
✣ : Heavy interrupted cutting

## POSITIVE TYPE



**Square, 90° without hole Positive 11°**

| | | Coating | | | | | | Cermet | | | | Uncoated | | | | Ceramics | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ɔ✣ | | | | | | ●ɔ | | | | ● | ● | | | | | | | | | | | | | | | | |
| M | Stainless | | | | | | | | | | | ● | ● | | | | | | | | | | | | | | | | |
| K | Cast iron | | ɔ | | | | | ●ɔ | | | | ● | | | | | | | | | | | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | ● | | | | | | | | | | | | | | | | | |
| S | Superalloys | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | ● | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9125 | T5115 | NS9530 | TH10 | UX30 | LX11 |
|---|---|---|---|---|---|---|---|---|---|
| Finishing to medium cutting | 23 | SPMR090304-23 | 0.4 | | | ● | | | |
| | | SPMR090308-23 | 0.8 | ● | | ● | | | |
| | | SPMR120304-23 | 0.4 | ● | | ● | | | |
| | | SPMR120308-23 | 0.8 | ● | | ● | | | |
| | CM | SPMR090304-CM | 0.4 | | ● | | | | |
| | | SPMR090308-CM | 0.8 | | ● | | | | |
| | | SPMR120304-CM | 0.4 | | ● | | | | |
| | | SPMR120308-CM | 0.8 | | ● | | | | |
| | | SPMR120312-CM | 1.2 | | ● | | | | |
| | - | SPGR090304L | 0.4 | | | ● | | | |
| | - | SPGN090304 | 0.4 | | | | ● | | ● |
| | | SPGN090308 | 0.8 | | | | ● | | ● |
| | | SPGN120304 | 0.4 | | | | ● | | ● |
| | | SPGN120308 | 0.8 | | | | ● | | ● |
| | | SPGN120312 | 1.2 | | | ● | | | ● |
| | | SPGN120408 | 0.8 | | | | ● | | |
| | - | SPMN090304 | 0.4 | | ● | | | | |
| | | SPMN090308 | 0.8 | | ● | | | | |
| | | SPMN120304 | 0.4 | | ● | | | | |
| | | SPMN120308 | 0.8 | | ● | ● | ● | ● | |
| | | SPMN120312 | 1.2 | | ● | | ● | | |
| | | SPMN120408 | 0.8 | | ● | | ● | | |
| | | SPMN120412 | 1.2 | | ● | | | | |

● : Line-up

External toolholders → B242 - Internal toolholders → B282, B305
Cartridges → F152 -

● : Continuous cutting
◐ : Light interrupted cutting
✣ : Heavy interrupted cutting

## POSITIVE TYPE



**Triangular, 60° with hole Positive 7°**

| | | |
|---|---|---|
| P | Steel | ●◐ ◐✣ ◐ ●◐ ●◐ ●◐ |
| M | Stainless | ◐ ●◐ ●◐ ● |
| K | Cast iron | ●◐ ◐ ●◐ ●◐ ●◐ ● |
| N | Non-ferrous | ● |
| S | Superalloys | ● |
| H | Hard materials | |

| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | Coated cermet | Cermet | | Uncoated |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9115 | T9125 | AH725 | SH725 | J740 | GT9530 | NS9530 | NS520 | TH10 |
| Precision finishing | 01 | TCGT090204-01 | 0.4 | | | | | | | | ● | ● |
| | | TCGT110202-01 | 0.2 | | | | | ● | | | | |
| | | TCGT110204-01 | 0.4 | | | | | | ● | ● | ● | ● |
| | | TCGT110208-01 | 0.8 | | | | | | | ● | | |
| | | TCGT16T304-01 | 0.4 | | | | | | | | | ● |
| | | TCGT16T308-01 | 0.8 | | | | | | | | ● | ● |
| Precision finishing (Sharp edgeds) | 01 | TCGT110202F-01 | 0.2 | | | | ● | | | | | |
| Finishing | PSF | TCMT090202-PSF | 0.2 | | | ● | | | | | | |
| | | TCMT090204-PSF | 0.4 | ● | ● | ● | | | | | | |
| | | TCMT110202-PSF | 0.2 | | | ● | | | | | | |
| | | TCMT110204-PSF | 0.4 | ● | ● | ● | | | | | | |
| | | TCMT110302-PSF | 0.2 | | | ● | | | | | | |
| | | TCMT110304-PSF | 0.4 | ● | ● | ● | | | | | | |
| | | TCMT16T304-PSF | 0.4 | ● | ● | ● | | | | | | |
| Finishing to light cutting | PSS | TCMT090204-PSS | 0.4 | ● | ● | ● | | | | | | |
| | | TCMT090208-PSS | 0.8 | ● | ● | ● | | | | | | |
| | | TCMT110204-PSS | 0.4 | ● | ● | ● | | | | | | |
| | | TCMT110208-PSS | 0.8 | ● | ● | ● | | | | | | |
| | | TCMT110304-PSS | 0.4 | ● | ● | ● | | | | | | |
| | | TCMT110308-PSS | 0.8 | ● | ● | ● | | | | | | |
| | | TCMT16T304-PSS | 0.4 | ● | ● | ● | | | | | | |
| | | TCMT16T308-PSS | 0.8 | ● | ● | ● | | | | | | |
| | | TCMT16T312-PSS | 1.2 | ● | ● | ● | | | | | | |

● : Line-up

External toolholders → B246 Internal toolholders → B283
J series toolholders → B336 PINZBOHR® → F136 - F151

● : Continuous cutting
ɔ : Light interrupted cutting
✣ : Heavy interrupted cutting

## POSITIVE TYPE



**Triangular, 60° with hole Positive 7°**

| | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ●ɔ | ɔ✣ | ɔ | ✣ | ɔ✣ | ✣ | ɔ | ɔ | | | | ●ɔ | | | | ●ɔ | | | | ● | | | |
| M | Stainless | | | ● | ɔ | ɔ | ✣ | ɔ | ɔ | | | | | | | | | | | | ● | | | |
| K | Cast iron | ●ɔ | | | | | | ɔ | ɔ | | | | ●ɔ | | | | ●ɔ | | | | ● | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | | | ● | | | |
| S | Superalloys | | | | | | | ● | | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | | | | | | Coated cermet | | | | Cermet | | | | Uncoated | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9115 | T9125 | T6120 | T6130 | AH630 | AH645 | AH725 | GH730 | | | GT9530 | | | | NS9530 | | | | TH10 | | | | |
| Finishing to medium cutting | PS | TCMT090204-PS | 0.4 | | | | | | | ● | | | | | | | | | | | | | | | | |
| |  | TCMT090208-PS | 0.8 | | | | | | | ● | | | | | | | | | | | | | | | | |
| | | TCMT110202-PS | 0.2 | ● | ● | ● | ● | ● | ● | ● | ● | | | ● | | | | ● | | | | | | | | |
| | | TCMT110204-PS | 0.4 | ● | ● | ● | ● | ● | ● | ● | ● | | | ● | | | | ● | | | | | | | | |
| | | TCMT110208-PS | 0.8 | ● | ● | ● | ● | ● | ● | ● | ● | | | ● | | | | ● | | | | | | | | |
| | | TCMT110302-PS | 0.2 | ● | ● | ● | ● | ● | ● | | | | | | | | | | | | | | | | | |
| | | TCMT110304-PS | 0.4 | ● | ● | ● | ● | ● | ● | | | | | | | | | | | | | | | | | |
| | | TCMT110308-PS | 0.8 | ● | ● | ● | ● | ● | ● | | | | | | | | | | | | | | | | | |
| | | TCMT16T302-PS | 0.2 | ● | ● | ● | ● | ● | ● | ● | | | | | | | | ● | | | | | | | | |
| | | TCMT16T304-PS | 0.4 | ● | ● | ● | ● | ● | ● | ● | | | | | | | | ● | | | | | | | | |
| | | TCMT16T308-PS | 0.8 | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | | | | | | | | |
| | 23 | TCMT090204-23 | 0.4 | | ● | | | | | | | | | | | | | ● | | | | | | | | |
| |  | TCMT110204-23 | 0.4 | | | | | | | | | | | | | | | ● | | | | | | | | |
| | | TCMT16T304-23 | 0.4 | | | | | | | | | | | | | | | ● | | | | | | | | |
| | | TCMT16T308-23 | 0.8 | | ● | | | | | | | | | | | | | | | | | | | | | |
| Medium cutting | 24 | TCMT090202-24 | 0.2 | | | | | | | | | | | | | | | ● | | | | | | | | |
| |  | TCMT090204-24 | 0.4 | ● | ● | | | | | | | | | | | | | ● | | | | | | | | |
| | | TCMT110202-24 | 0.2 | | | | | | | | | | | | | | | ● | | | | | | | | |
| | | TCMT110204-24 | 0.4 | ● | ● | | | | | | | | | | | | | ● | | | | | | | | |
| | | TCMT110208-24 | 0.8 | | ● | | | | | | | | | | | | | | | | | | | | | |
| | | TCMT16T304-24 | 0.4 | ● | ● | | | | | | | | | | | | | | | | | | | | | |
| | | TCMT16T308-24 | 0.8 | ● | ● | | | | | ● | | | | | | | | | | | | | | | | |
| Finishing | W15 | TCGT16T302L-W15 | 0.2 | | | | | | | | | | | | | | | | | | | ● | | | | |
| |  | TCGT16T304L-W15 | 0.4 | | | | | | | | | | | | | | | ● | | | | ● | | | | |
| | | TCGT16T308L-W15 | 0.8 | | | | | | | | | | | | | | | | | | | ● | | | | |

● : Line-up


External toolholders → B246 Internal toolholders → B283
J series toolholders → B336 PINZBOHR® → F136 - F151

● : Continuous cutting
◐ : Light interrupted cutting
✣ : Heavy interrupted cutting

## POSITIVE TYPE



**Triangular, 60° with hole Positive 7°**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ●◐ | ◐✣ | ◐ | ✣ | ◐✣ | ✣ | | | ◐ | | | | ●◐ | | | | | | | | | | | | | | |
| M | Stainless | | | ● | ◐ | ◐ | ✣ | | | ◐ | | | | | | | | | | | | | | | | | | |
| K | Cast iron | ●◐ | | | | | | ●◐ | ◐ | ◐ | | | | ●◐ | | | | ● | | | | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | ● | | | | | | | | | | |
| S | Superalloys | | | | | | | | | ● | | | | | | | | ● | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | | | | | | Cermet | | | | Uncoated | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9115 | T9125 | T6120 | T6130 | AH630 | AH645 | T515 | T5115 | AH725 | | NS9530 | | | | KS05F | | | | | | | | | | |
| Medium cutting | PM | TCMT110202-PM | 0.2 | | | ● | ● | ● | ● | | | ● | | | | | | | | | | | | | | | | |
| | | TCMT110204-PM | 0.4 | ● | ● | ● | ● | ● | ● | | | ● | | ● | | | | | | | | | | | | | | |
| | | TCMT110208-PM | 0.8 | ● | ● | ● | ● | ● | ● | | | ● | | ● | | | | | | | | | | | | | | |
| | | TCMT110302-PM | 0.2 | | | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | | |
| | | TCMT110304-PM | 0.4 | | | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | | |
| | | TCMT110308-PM | 0.8 | | | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | | |
| | | TCMT16T304-PM | 0.4 | ● | ● | ● | ● | ● | ● | | | ● | | ● | | | | | | | | | | | | | | |
| | | TCMT16T308-PM | 0.8 | ● | ● | ● | ● | ● | ● | | | ● | | ● | | | | | | | | | | | | | | |
| | | TCMT16T312-PM | 1.2 | ● | ● | ● | ● | ● | ● | | | ● | | | | | | | | | | | | | | | | |
| Finishing to medium cutting | CM | TCMT090204-CM | 0.4 | | | | | | | | ● | | | | | | | | | | | | | | | | | |
| | | TCMT090208-CM | 0.8 | | | | | | | | ● | | | | | | | | | | | | | | | | | |
| | | TCMT110204-CM | 0.4 | | | | | | | | ● | | | | | | | | | | | | | | | | | |
| | | TCMT110208-CM | 0.8 | | | | | | | | ● | | | | | | | | | | | | | | | | | |
| | | TCMT110304-CM | 0.4 | | | | | | | | ● | | | | | | | | | | | | | | | | | |
| | | TCMT110308-CM | 0.8 | | | | | | | | ● | | | | | | | | | | | | | | | | | |
| | | TCMT16T304-CM | 0.4 | | | | | | | ● | ● | | | | | | | | | | | | | | | | | |
| | | TCMT16T308-CM | 0.8 | | | | | | | ● | ● | | | | | | | | | | | | | | | | | |
| | | TCMT16T312-CM | 1.2 | | | | | | | ● | ● | | | | | | | | | | | | | | | | | |
| | SS | TCGT110202-SS | 0.2 | | | | | | | | | | | ● | | | | | | | | | | | | | | |
| | | TCGT110204-SS | 0.4 | | | | | | | | | | | ● | | | | | | | | | | | | | | |
| | | TCGT110208-SS | 0.8 | | | | | | | | | | | ● | | | | | | | | | | | | | | |
| | | TCGT16T304-SS | 0.4 | | | | | | | | | | | ● | | | | | | | | | | | | | | |
| | AL | TCGT110202-AL | 0.2 | | | | | | | | | | | | | | | ● | | | | | | | | | | |
| | | TCGT110204-AL | 0.4 | | | | | | | | | | | | | | | ● | | | | | | | | | | |
| | | TCGT16T302-AL | 0.2 | | | | | | | | | | | | | | | ● | | | | | | | | | | |
| | | TCGT16T304-AL | 0.4 | | | | | | | | | | | | | | | ● | | | | | | | | | | |
| | | TCGT16T308-AL | 0.8 | | | | | | | | | | | | | | | ● | | | | | | | | | | |

● : Line-up

External toolholders → B246 Internal toolholders → B283
J series toolholders → B336 PINZBOHR® → F136 - F151

● : Continuous cutting
ɔ : Light interrupted cutting
✣ : Heavy interrupted cutting

## POSITIVE TYPE



**Triangular, 60° with hole Positive 7°**

| | | |

# TurnLine - Insert

## POSITIVE TYPE



**Triangular, 60° with hole Positive 7°**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ●◐ | ●◐ | | | | | ●◐ | | | | | | ●◐ | | | | | ● | | | | | | | | | | | | | | | |
| M | Stainless | ●◐ | ●◐ | | | | | | | | | | | | | | | | ● | | | | | | | | | | | | | | | |
| K | Cast iron | | | | | | | ●◐ | | | | | | ●◐ | | | | | ● | | | | | | | | | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | ● | | | | | | | | | | | | | | | |
| S | Superalloys | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | Coated cermet | | | | | Cermet | | | | | Uncoated | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | SH725 | J740 | | | | J9530 | | | | | NS9530 | | | | | TH10 | | | | | | | | | | | | | | | | |
| For external turning on small lathes (Sharp edge) | J10 | TCGT110200FR-J10 | 0.03 | ● | ● | | | | | | | | | | | | | | ● | | | | | | | | | | | | | | | | |
| | | TCGT110200FL-J10 | 0.03 | ● | ● | | | | | | | | | | | | | | ● | | | | | | | | | | | | | | | | |
| | | TCGT110201FR-J10 | 0.1 | ● | ● | | | | | | | | | | | | | | ● | | | | | | | | | | | | | | | | |
| | | TCGT110201FL-J10 | 0.1 | ● | ● | | | | | | | | | | | | | | ● | | | | | | | | | | | | | | | | |
| | | TCGT110202FR-J10 | 0.2 | ● | ● | | | | | | | | | ● | | | | | ● | | | | | | | | | | | | | | | | |
| | | TCGT110202FL-J10 | 0.2 | ● | ● | | | | | | | | | ● | | | | | ● | | | | | | | | | | | | | | | | |
| | | TCGT110204FR-J10 | 0.4 | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | TCGT110300FR-J10 | 0.03 | ● | ● | | | | | | | | | | | | | | ● | | | | | | | | | | | | | | | | |
| | | TCGT110300FL-J10 | 0.03 | ● | ● | | | | | | | | | | | | | | ● | | | | | | | | | | | | | | | | |
| | | TCGT110301FR-J10 | 0.1 | ● | ● | | | | | | | | | | | | | | ● | | | | | | | | | | | | | | | | |
| | | TCGT110301FL-J10 | 0.1 | ● | ● | | | | | | | | | | | | | | ● | | | | | | | | | | | | | | | | |
| | | TCGT110302FR-J10 | 0.2 | ● | ● | | | | | | | | | ● | | | | | ● | | | | | | | | | | | | | | | | |
| | | TCGT110302FL-J10 | 0.2 | ● | ● | | | | | | | | | ● | | | | | ● | | | | | | | | | | | | | | | | |
| On small lathes (Honed edge) | J10 | TCGT110302R-J10 | 0.2 | | | | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | TCGT110302L-J10 | 0.2 | | | | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | |

● : Line-up

Internal toolholders → B283
J series toolholders → B336

● : Continuous cutting
ɔ : Light interrupted cutting
✣ : Heavy interrupted cutting

## POSITIVE TYPE



**Triangular, 60° with hole Positive 11°**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ●ɔ | ɔ✣ | ɔ | ɔ | | | | ●ɔ | ●ɔ | | | ●ɔ | ●ɔ | | | ● | | | | | | | | | | | | | | |
| M | Stainless | | | ɔ | ɔ | | | | | | | | | | | | ● | | | | | | | | | | | | | | |
| K | Cast iron | ●ɔ | | ɔ | ɔ | | | | ●ɔ | ●ɔ | | | ●ɔ | ●ɔ | | | ● | | | | | | | | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | ● | | | | | | | | | | | | | | |
| S | Superalloys | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | | | Coated cermet | | | | Cermet | | | | Uncoated | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9115 | T9125 | AH725 | GH730 | | | | GT9530 | GT720 | | | NS9530 | NS520 | | | TH10 | | | | | | | | | | | | |
| Precision finishing | 01 | TPGT090202-01 | 0.2 | | | | | | | | ● | | | | ● | | | | | | | | | | | | | | | | |
| | | TPGT090204-01 | 0.4 | | | | | | | | ● | | | | ● | ● | | | ● | | | | | | | | | | | | |
| | | TPGT110202-01 | 0.2 | | | | | | | | ● | | | | ● | | | | | | | | | | | | | | | | |
| | | TPGT110204-01 | 0.4 | | | | | | | | ● | | | | ● | ● | | | ● | | | | | | | | | | | | |
| | | TPGT110208-01 | 0.8 | | | | | | | | | | | | ● | | | | | | | | | | | | | | | | |
| | | TPGT130302-01 | 0.2 | | | | | | | | | ● | | | ● | | | | | | | | | | | | | | | | |
| | | TPGT130304-01 | 0.4 | | | | | | | | ● | | | | ● | ● | | | ● | | | | | | | | | | | | |
| | | TPGT130308-01 | 0.8 | | | | | | | | | | | | ● | ● | | | | | | | | | | | | | | | |
| | | TPGT16T304-01 | 0.4 | | | | | | | | ● | | | | ● | ● | | | ● | | | | | | | | | | | | |
| | | TPGT16T308-01 | 0.8 | | | | | | | | | ● | | | ● | ● | | | | | | | | | | | | | | | |
| Finishing | PSF | TPMT090202-PSF | 0.2 | | | ● | | | | | | | | | ● | | | | | | | | | | | | | | | | |
| | | TPMT090204-PSF | 0.4 | ● | ● | ● | | | | | ● | | | | ● | | | | | | | | | | | | | | | | |
| | | TPMT110202-PSF | 0.2 | | | ● | | | | | ● | | | | ● | | | | | | | | | | | | | | | | |
| | | TPMT110204-PSF | 0.4 | ● | ● | ● | | | | | ● | | | | ● | | | | | | | | | | | | | | | | |
| | | TPMT110302-PSF | 0.2 | | | ● | | | | | | | | | ● | | | | | | | | | | | | | | | | |
| | | TPMT110304-PSF | 0.4 | ● | ● | ● | | | | | ● | | | | ● | | | | | | | | | | | | | | | | |
| | | TPMT130304-PSF | 0.4 | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | TPMT16T304-PSF | 0.4 | ● | ● | ● | | | | | | | | | ● | | | | | | | | | | | | | | | | |
| | PF | TPMT110204-PF | 0.4 | | | | ● | | | | ● | | | | ● | | | | | | | | | | | | | | | | |
| | | TPMT110208-PF | 0.8 | | | | | | | | ● | | | | ● | | | | | | | | | | | | | | | | |
| | | TPMT110302-PF | 0.2 | | | | ● | | | | | | | | ● | | | | | | | | | | | | | | | | |
| | | TPMT110304-PF | 0.4 | | | | ● | | | | ● | | | | ● | | | | | | | | | | | | | | | | |
| | | TPMT130304-PF | 0.4 | | | | | | | | ● | | | | ● | | | | | | | | | | | | | | | | |
| | | TPMT130308-PF | 0.8 | | | | | | | | | | | | ● | | | | | | | | | | | | | | | | |
| | | TPMT16T304-PF | 0.4 | | | | | | | | ● | | | | ● | | | | | | | | | | | | | | | | |

● : Line-up

Mounting hole specifications → **B136**

External toolholders → **B242 - B244** Internal toolholders → **B284 -**
Cartridges → **F152 -**

● : Continuous cutting
c : Light interrupted cutting
✣ : Heavy interrupted cutting

## POSITIVE TYPE



**Triangular, 60° with hole Positive 11°**

| | | |
|---|---|---|
| P | Steel | ●c ●c✣ c ✣ c✣ ✣ ●c c c |
| M | Stainless | ● c c ✣ ●c c c |
| K | Cast iron | ●c ●c c c |
| N | Non-ferrous | |
| S | Superalloys | ●c ● |
| H | Hard materials | |

| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | | | | | Coated cermet | | Cermet | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9115 | T9125 | T6120 | T6130 | AH630 | AH645 | AH120 | AH725 | GH730 | GT9530 | | NS9530 | | |
| Finishing to light cutting | PSS | TPMT090204-PSS | 0.4 | ● | ● | ● | ● | ● | ● | | ● | | ● | | ● | | |
| | | TPMT090208-PSS | 0.8 | ● | ● | ● | ● | ● | ● | | ● | | ● | | ● | | |
| | | TPMT110204-PSS | 0.4 | ● | ● | ● | ● | ● | ● | | ● | | ● | | ● | | |
| | | TPMT110208-PSS | 0.8 | ● | ● | ● | ● | ● | ● | | ● | | ● | | ● | | |
| | | TPMT110304-PSS | 0.4 | ● | ● | ● | ● | ● | ● | | ● | | | | | | |
| | | TPMT110308-PSS | 0.8 | ● | ● | ● | ● | ● | ● | | ● | | | | | | |
| | | TPMT130304-PSS | 0.4 | ● | ● | ● | ● | ● | ● | | ● | | | | | | |
| | | TPMT130308-PSS | 0.8 | ● | ● | ● | ● | ● | ● | | ● | | ● | | ● | | |
| | | TPMT16T304-PSS | 0.4 | ● | ● | ● | ● | ● | ● | | ● | | ● | | ● | | |
| | | TPMT16T308-PSS | 0.8 | ● | ● | ● | ● | ● | ● | | ● | | ● | | ● | | |
| Finishing to medium cutting | PS | TPMT090202-PS | 0.2 | ● | ● | ● | ● | ● | ● | | ● | ● | ● | | ● | | |
| | | TPMT090204-PS | 0.4 | ● | ● | ● | ● | ● | ● | | ● | ● | ● | | ● | | |
| | | TPMT090208-PS | 0.8 | ● | ● | ● | ● | ● | ● | | ● | ● | ● | | ● | | |
| | | TPMT110202-PS | 0.2 | ● | ● | ● | ● | ● | ● | | ● | ● | ● | | ● | | |
| | | TPMT110204-PS | 0.4 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | | |
| | | TPMT110208-PS | 0.8 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | | |
| | | TPMT110304-PS | 0.4 | ● | ● | ● | ● | ● | ● | | ● | ● | ● | | ● | | |
| | | TPMT110308-PS | 0.8 | ● | ● | ● | ● | ● | ● | | ● | ● | ● | | ● | | |
| | | TPMT130302-PS | 0.2 | ● | ● | | | | | | ● | | ● | | ● | | |
| | | TPMT130304-PS | 0.4 | ● | ● | ● | ● | ● | ● | | ● | | ● | | ● | | |
| | | TPMT130308-PS | 0.8 | ● | ● | ● | ● | ● | ● | | ● | | ● | | ● | | |
| | | TPMT16T304-PS | 0.4 | ● | ● | ● | ● | ● | ● | | ● | | ● | | ● | | |
| | | TPMT16T308-PS | 0.8 | ● | ● | ● | ● | ● | ● | | ● | | ● | | ● | | |
| | 23 | TPMT090202-23 | 0.2 | | | | | | | | | | | | ● | | |
| | | TPMT090204-23 | 0.4 | | ● | | | | | | | | | | ● | | |
| | | TPMT110204-23 | 0.4 | | ● | | | | | | | | | | ● | | |
| | | TPMT130304-23 | 0.4 | | ● | | | | | | | | | | ● | | |
| | | TPMT130308-23 | 0.8 | | ● | | | | | | | | | | ● | | |
| | | TPMT16T304-23 | 0.4 | | | | | | | | | | | | ● | | |
| | | TPMT16T308-23 | 0.8 | | ● | | | | | | | | | | ● | | |

● : Line-up

Mounting hole specifications → B136

External toolholders → B242 - B244 Internal toolholders → B284 -
Cartridges → F152 -

● : Continuous cutting
c : Light interrupted cutting
✣ : Heavy interrupted cutting

## POSITIVE TYPE



**Triangular, 60° with hole Positive 11°**

| | | |

● : Continuous cutting
ɔ : Light interrupted cutting
✣ : Heavy interrupted cutting

## POSITIVE TYPE



**Triangular, 60° with hole Positive 11°**

| | | |

● : Continuous cutting
ɔ : Light interrupted cutting
✣ : Heavy interrupted cutting

## POSITIVE TYPE



**Triangular, 60° with hole Positive 11°**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ●ɔ | ɔ✣ | ɔ | ✣ | ɔ✣ | ✣ | | | ●ɔ | ɔ | ●ɔ | ɔ | | | ●ɔ | | | | ●ɔ | | | | | | | | | | | |
| M | Stainless | | | ● | ɔ | ɔ | ✣ | | | ●ɔ | ɔ | ●ɔ | ɔ | | | | | | | | | | | | | | | | | | |
| K | Cast iron | ●ɔ | | | | | | ●ɔ | ɔ | ●ɔ | ɔ | ●ɔ | ɔ | | | ●ɔ | | | | ●ɔ | | | | | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S | Superalloys | | | | | | | | | ●ɔ | ● | | | | | | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | | | | | | | | | Coated cermet | | | | Cermet | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9115 | T9125 | T6120 | T6130 | AH630 | AH645 | T515 | T5115 | AH120 | AH725 | GH330 | GH730 | | GT9530 | | | | NS9530 | | | | | | | | | | |
| Medium cutting | **PM** | **TPMT090204-PM** | 0.4 | | | ● | ● | ● | ● | | | | ● | | | | | | | | | | | | | | | | | | |
| | | **TPMT090208-PM** | 0.8 | | | ● | ● | ● | ● | | | | ● | | | | | | | | | | | | | | | | | | |
| | | **TPMT110204-PM** | 0.4 | ● | ● | ● | ● | ● | ● | | | | ● | | ● | | ● | | | | ● | | | | | | | | | | |
| | | **TPMT110208-PM** | 0.8 | ● | ● | ● | ● | ● | ● | | | ● | ● | | ● | | | | | | | | | | | | | | | | |
| | | **TPMT110304-PM** | 0.4 | ● | ● | ● | ● | ● | ● | | | | ● | | ● | | ● | | | | ● | | | | | | | | | | |
| | | **TPMT110308-PM** | 0.8 | ● | ● | ● | ● | ● | ● | | | | ● | | ● | | | | | | | | | | | | | | | | |
| | | **TPMT130304-PM** | 0.4 | | ● | ● | ● | ● | ● | | | | ● | | | | | | | | ● | | | | | | | | | | |
| | | **TPMT130308-PM** | 0.8 | | ● | ● | ● | ● | ● | | | | ● | | | | ● | | | | ● | | | | | | | | | | |
| | | **TPMT16T304-PM** | 0.4 | | ● | ● | ● | ● | ● | | | | ● | | | | | | | | ● | | | | | | | | | | |
| | | **TPMT16T308-PM** | 0.8 | | ● | ● | ● | ● | ● | | | | ● | | | | | | | | | | | | | | | | | | |
| | | **TPMT16T312-PM** | 1.2 | | ● | ● | ● | ● | ● | | | | ● | | | | | | | | | | | | | | | | | | |
| Finishing to medium cutting | **CM** | **TPMT090204-CM** | 0.4 | | | | | | | | ● | | | | | | | | | | | | | | | | | | | | |
| | | **TPMT090208-CM** | 0.8 | | | | | | | | ● | | | | | | | | | | | | | | | | | | | | |
| | | **TPMT110204-CM** | 0.4 | | | | | | | | ● | | | | | | | | | | | | | | | | | | | | |
| | | **TPMT110208-CM** | 0.8 | | | | | | | | ● | | | | | | | | | | | | | | | | | | | | |
| | | **TPMT110304-CM** | 0.4 | | | | | | | | ● | | | | | | | | | | | | | | | | | | | | |
| | | **TPMT110308-CM** | 0.8 | | | | | | | | ● | | | | | | | | | | | | | | | | | | | | |
| | | **TPMT130304-CM** | 0.4 | | | | | | | | ● | | | | | | | | | | | | | | | | | | | | |
| | | **TPMT130308-CM** | 0.8 | | | | | | | | ● | | | | | | | | | | | | | | | | | | | | |
| | | **TPMT16T304-CM** | 0.4 | | | | | | | ● | ● | | | | | | | | | | | | | | | | | | | | |
| | | **TPMT16T308-CM** | 0.8 | | | | | | | ● | ● | | | | | | | | | | | | | | | | | | | | |
| | | **TPMT16T312-CM** | 1.2 | | | | | | | ● | ● | | | | | | | | | | | | | | | | | | | | |
| | **SS** | **TPGT110202-SS** | 0.2 | | | | | | | | | | | | | | | | | | ● | | | | | | | | | | |
| | | **TPGT110204-SS** | 0.4 | | | | | | | | | | | ● | | | | | | | ● | | | | | | | | | | |
| | | **TPGT130302-SS** | 0.2 | | | | | | | | | | | | | | | | | | ● | | | | | | | | | | |
| | | **TPGT130304-SS** | 0.4 | | | | | | | | | | | ● | | | | | | | ● | | | | | | | | | | |
| | | **TPGT16T304-SS** | 0.4 | | | | | | | | | | | ● | | | | | | | ● | | | | | | | | | | |

● : Line-up

Mounting hole specifications → **B136**

External toolholders → **B242 - B244** Internal toolholders → **B284 -**
Cartridges → **F152 -**

# TurnLine - Insert

● : Continuous cutting
c : Light interrupted cutting
✣ : Heavy interrupted cutting

## POSITIVE TYPE



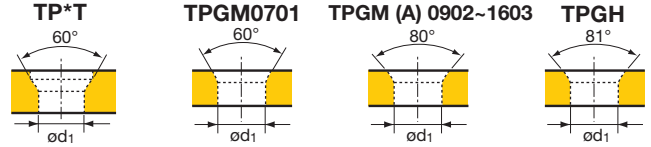
**Triangular, 60° with hole Positive 11°**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | | | | | | | ●c | | | | ●c | | | | ● | c | | | | | | | | | | | | | | | | |
| M | Stainless | | | | | | | | | | | | | | | ● | c | | | | | | | | | | | | | | | | |
| K | Cast iron | c | | | | | | ●c | | | | ●c | | | | ● | | | | | | | | | | | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | ● | | | | | | | | | | | | | | | | | |
| S | Superalloys | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | Coating | | | Coated cermet | | | Cermet | | | Uncoated | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T5115 | | | GT9530 | | | NS9530 | | | TH10 | UX30 | | | | | | | | | | | | | | | | | | |
| Finishing to medium cutting | H11 | TPGH110302L-H11 | 0.2 | | | | ● | | | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | TPGH110304L-H11 | 0.4 | | | | ● | | | ● | | | | | | | | | | | | | | | | | | | | | | |
| |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | - | TPGM070102R | 0.2 | | | | | | | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | TPGM070102L | 0.2 | | | | | | | ● | | | ● | | | | | | | | | | | | | | | | | | | |
| | | TPGM070104R | 0.4 | | | | | | | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | TPGM070104L | 0.4 | | | | | | | ● | | | ● | | | | | | | | | | | | | | | | | | | |
| | | TPGM090202R | 0.2 | | | | | | | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | TPGM090202L | 0.2 | | | | | | | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | TPGM090204L | 0.4 | | | | | | | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | TPGM110202R | 0.2 | | | | | | | ● | | | | | | | | | | | | | | | | | | | | | | |
| | Tungaloy-standard hole Not ISO | TPGM110202L | 0.2 | | | | | | | ● | | | | ● | | | | | | | | | | | | | | | | | | |
| | | TPGM110204R | 0.4 | | | | | | | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | TPGM110204L | 0.4 | | | | | | | ● | | | | ● | | | | | | | | | | | | | | | | | | |
| | | TPGM110302R | 0.2 | | | | | | | ● | | | | | | | | | | | | | | | | | | | | | | |
| |  | TPGM110302L | 0.2 | | | | | | | ● | | | | | | | | | | | | | | | | | | | | | | |
| | TPGM...R/L | TPGM110302L-2 | 0.2 | | | | | | | | | | ● | | | | | | | | | | | | | | | | | | | |
| | | TPGM110304R | 0.4 | | | | | | | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | TPGM110304L | 0.4 | | | | | | | ● | | | | ● | | | | | | | | | | | | | | | | | | |
| | | TPGM110304L-2 | 0.4 | | | | | | | | | | ● | | | | | | | | | | | | | | | | | | | |
| | | TPGM160302L | 0.2 | | | | | | | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | TPGM160304R | 0.4 | | | | | | | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | TPGM160304L | 0.4 | | | | | | | ● | | | | ● | | | | | | | | | | | | | | | | | | |
| | | TPGM160304L-2 | 0.4 | | | | | | | | | | ● | | | | | | | | | | | | | | | | | | | |
| | - | TPMW110204 | 0.4 | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | TPMW110208 | 0.8 | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | TPMW130304 | 0.4 | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| |  | TPMW130308 | 0.8 | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | TPMW16T304 | 0.4 | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | TPMW16T308 | 0.8 | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

● : Line-up

Mounting hole specifications




| ød1 (mm) | 0701** | 0802** | 0902** | 1102** | 1103** | 1303** | 1603** | 16T3** |
|---|---|---|---|---|---|---|---|---|
| TP*T(W) | - | 2.3 | 2.5 | 2.8 | 3.4 | 3.4 | - | 4.4 |
| TPGM(A) | 2.7 | - | 3.2 | 3.0 | 3.0 | - | 4.0 | - |
| TPGH | - | 2.3 | 3.0 | 3.4 | 3.4 | - | 4.5 | - |

External toolholders → B242 - B244 Internal toolholders → B284 -
Cartridges → F152 -

● : Continuous cutting
ɔ : Light interrupted cutting
✣ : Heavy interrupted cutting

## POSITIVE TYPE



**Triangular, 60° with hole Positive 11°**

| | | GH110 | NS9530 | TH10 |
|---|---|---|---|---|
| P | Steel | ● | ●ɔ | ● |
| M | Stainless | ● | | ● |
| K | Cast iron | ● | ●ɔ | ● |
| N | Non-ferrous | | | ● |
| S | Superalloys | ● | | |
| H | Hard materials | | | |

| Application | Chipbreaker | Designation | Corner radius | Coating GH110 | Cermet NS9530 | Uncoated TH10 |
|---|---|---|---|---|---|---|
| Finishing to medium cutting | - | TPGA090204 | 0.4 | | | ● |
| | | TPGA110202 | 0.2 | | ● | ● |
| | | TPGA110204 | 0.4 | | | ● |
| | | TPGA110302 | 0.2 | | ● | ● |
| | | TPGA110304 | 0.4 | | | ● |
| | | TPGA160304 | 0.4 | | ● | ● |
| | | TPGA160308 | 0.8 | | | ● |
| | - | TPGW090202 | 0.2 | | | ● |
| | | TPGW090204 | 0.4 | | | ● |
| | | TPGW110202 | 0.2 | | | ● |
| | | TPGW110204 | 0.4 | ● | | ● |
| | | TPGW110304 | 0.4 | | | ● |
| | | TPGW130304 | 0.4 | | | ● |
| | | TPGW16T304 | 0.4 | ● | | ● |
| | | TPGW16T308 | 0.8 | | | ● |

● : Line-up

External toolholders → **B242 - B244** Internal toolholders → **B284 -**
Cartridges → **F152 -**

● : Continuous cutting
c : Light interrupted cutting
✣ : Heavy interrupted cutting

## POSITIVE TYPE



**Triangular, 60° with hole Positive 11°**

| | | |
|---|---|---|
| P | Steel | ●c●c |
| M | Stainless | ●c●c |
| K | Cast iron | |
| N | Non-ferrous | |
| S | Superalloys | ●c |
| H | Hard materials | |

| Application | Chipbreaker | Designation | Corner radius | Coating SH725 | Coating SH730 |
|---|---|---|---|---|---|
| For internal turning on small lathes | JS | TPGT070101-JS | 0.1 | | ● |
| |  | TPGT070102-JS | 0.2 | | ● |
| | | TPGT070104-JS | 0.4 | | ● |
| For internal turning on small lathes (Sharp edge) | JS | TPGT070101F-JS | 0.1 | ● | |
| |  | TPGT070102F-JS | 0.2 | ● | |
| | | TPGT070104F-JS | 0.4 | ● | |

● : Line-up

Internal toolholders → B284 -

● : Continuous cutting
ⓒ : Light interrupted cutting
✣ : Heavy interrupted cutting

## POSITIVE TYPE



**Triangular, 60° without hole Positive 11°**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ●ⓒ | ●ⓒ | ✣ | | ⓒ | | | | ●ⓒ | | | | ● | | | | | | | | | | | | | | | | | | |
| M | Stainless | | | | | ⓒ | | | | | | | | ● | | | | | | | | | | | | | | | | | | |
| K | Cast iron | ●ⓒ | | | ⓒ | ⓒ | | | | ●ⓒ | | | | ● | | | | | | | | | | | | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | ● | | | | | | | | | | | | | | | | | | |
| S | Superalloys | | | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | | | Cermet | | | | Uncoated | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9115 | T9125 | T5115 | AH725 | | | | NS9530 | | | | TH10 | | | | | | | | | | | | | | | | | |
| Finishing to medium cutting | **PS** | **TPMR110304-PS** | 0.4 | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| |  | **TPMR110308-PS** | 0.8 | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | **TPMR160304-PS** | 0.4 | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | **TPMR160308-PS** | 0.8 | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | **23** | **TPMR110304-23** | 0.4 | ● | ● | | | | | | ● | | | | | | | | | | | | | | | | | | | | | |
| |  | **TPMR110308-23** | 0.8 | | ● | | | | | | ● | | | | ● | | | | | | | | | | | | | | | | | |
| | | **TPMR160304-23** | 0.4 | ● | ● | | | | | | ● | | | | ● | | | | | | | | | | | | | | | | | |
| | | **TPMR160308-23** | 0.8 | | ● | | | | | | ● | | | | | | | | | | | | | | | | | | | | | |
| Medium cutting | **24** | **TPMR110304-24** | 0.4 | | ● | | | | | | ● | | | | | | | | | | | | | | | | | | | | | |
| |  | **TPMR110308-24** | 0.8 | | ● | | | | | | ● | | | | | | | | | | | | | | | | | | | | | |
| | | **TPMR160304-24** | 0.4 | ● | ● | | ● | | | | ● | | | | | | | | | | | | | | | | | | | | | |
| | | **TPMR160308-24** | 0.8 | ● | ● | | | | | | ● | | | | | | | | | | | | | | | | | | | | | |
| Finishing to medium cutting | **CM** | **TPMR110304-CM** | 0.4 | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | |
| |  | **TPMR110308-CM** | 0.8 | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | **TPMR160304-CM** | 0.4 | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | **TPMR160308-CM** | 0.8 | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | **TPMR160312-CM** | 1.2 | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | |

● : Line-up

External toolholders → **B243, B244** Internal toolholders → **B305**
Cartridges → **F152 -**

# TurnLine - Insert

● : Continuous cutting
ɔ : Light interrupted cutting
✣ : Heavy interrupted cutting

## POSITIVE TYPE



**Triangular, 60° without hole Positive 11°**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | | ● | | | | ●ɔ | | | | ● | ɔ | | | | | | | | | | | | | | | | | | | |
| M | Stainless | | ● | | | | | | | | ● | ɔ | | | | | | | | | | | | | | | | | | | |
| K | Cast iron | ɔ | ● | | | | ●ɔ | | | | ● | | | | ● | | | | | | | | | | | | | | | | |
| N | Non-ferrous | | | | | | | | | | ● | | | | | | | | | | | | | | | | | | | | |
| S | Superalloys | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | ● | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | Cermet | | | | Uncoated | | | | Ceramics | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T5115 | GH110 | | | | NS9530 | | | | TH10 | UX30 | | | LX21 | LX11 | | | | | | | | | | | | | |
| Finishing to medium cutting | - | TPGR110302L | 0.2 | | | | | | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | TPGR110304L | 0.4 | | | | | | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | TPGR160304R | 0.4 | | | | | | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | TPGR160304L | 0.4 | | | | | | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | TPGR160308L | 0.8 | | | | | | ● | | | | | | | | | | | | | | | | | | | | | | |
| | - | TPMN110304 | 0.4 | ● | | | | | | | | | ● | | | | | | | | | | | | | | | | | | |
| | | TPMN110308 | 0.8 | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | TPMN160304 | 0.4 | ● | | | | | | | | | ● | | | | | | | | | | | | | | | | | | |
| | | TPMN160308 | 0.8 | ● | | | | | | | | | ● | ● | | | | | | | | | | | | | | | | | |
| | | TPMN160312 | 1.2 | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | TPMN220408 | 0.8 | | | | | | | | | | | ● | | | | | | | | | | | | | | | | | |
| | - | TPGN110302 | 0.2 | | | | | | | | | | ● | | | | | | | | | | | | | | | | | | |
| | | TPGN110304 | 0.4 | | ● | | | | | | | | ● | | | | ● | ● | | | | | | | | | | | | | |
| | | TPGN110308 | 0.8 | | | | | | | | | | ● | | | | | ● | | | | | | | | | | | | | |
| | | TPGN160302 | 0.2 | | | | | | | | | | ● | | | | | | | | | | | | | | | | | | |
| | | TPGN160304 | 0.4 | | ● | | | | ● | | | | ● | | | | | ● | | | | | | | | | | | | | |
| | | TPGN160308 | 0.8 | | ● | | | | ● | | | | ● | | | | | ● | | | | | | | | | | | | | |
| | | TPGN160312 | 1.2 | | | | | | | | | | | | | | | ● | | | | | | | | | | | | | |
| | | TPGN220404 | 0.4 | | | | | | | | | | ● | | | | | | | | | | | | | | | | | | |

● : Line-up

External toolholders → **B243, B244** Internal toolholders → **B305**
Cartridges → **F152 -**

● : Continuous cutting
ɔ : Light interrupted cutting
✣ : Heavy interrupted cutting

## POSITIVE TYPE



**Trigon, 80° with hole Positive 5°**

| | | Coating | | | | | | Cermet | | | | Uncoated | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | GH110 | | SH725 | | SH730 | | NS9530 | | | | TH10 | | UX30 | | | | | | | | | | | | | | | | | | |
| P | Steel | ● | | ●ɔ | | ●ɔ | | ●ɔ | | | | ● | | ɔ | | | | | | | | | | | | | | | | | | |
| M | Stainless | ● | | ●ɔ | | ●ɔ | | | | | | ● | | ɔ | | | | | | | | | | | | | | | | | | |
| K | Cast iron | ● | | | | | | ●ɔ | | | | ● | | | | | | | | | | | | | | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | ● | | | | | | | | | | | | | | | | | | | | |
| S | Superalloys | ● | | | | ●ɔ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | GH110 | SH725 | SH730 | NS9530 | TH10 | UX30 |
|---|---|---|---|---|---|---|---|---|---|
| Finishing | W08 | WBGT030100R-W08 | 0.03 | | | ● | | | |
| | | WBGT030100L-W08 | 0.03 | | | ● | ● | ● | ● |
| | | WBGT030101R-W08 | 0.1 | | | ● | | | |
| | | WBGT030101L-W08 | 0.1 | | | ● | | ● | |
| | | WBGT030102R-W08 | 0.2 | | | ● | | | |
| | | WBGT030102L-W08 | 0.2 | ● | | ● | ● | ● | ● |
| | | WBGT030104R-W08 | 0.4 | | | ● | | | |
| | | WBGT030104L-W08 | 0.4 | ● | | ● | ● | ● | ● |
| Finishing (Sharp edge) | W08 | WBGT030100FL-W08 | 0.03 | | ● | | | | |
| | | WBGT030100FR-W08 | 0.03 | | ● | | | | |
| | | WBGT030101FL-W08 | 0.1 | | ● | | | | |
| | | WBGT030101FR-W08 | 0.1 | | ● | | | | |
| | | WBGT030102FL-W08 | 0.2 | | ● | | | | |
| | | WBGT030102FR-W08 | 0.2 | | ● | | | | |
| | | WBGT030104FL-W08 | 0.4 | | ● | | | | |
| | | WBGT030104FR-W08 | 0.4 | | ● | | | | |
| | W11 | WBGT060102L-W11 | 0.2 | | | | ● | | |
| | | WBGT060104L-W11 | 0.4 | | | | ● | | |
| | | WBGT080202L-W11 | 0.2 | | | | ● | | |
| | | WBGT080204L-W11 | 0.4 | | | | ● | | |
| For internal turning on small lathes | JS | WBGT030101R-JS | 0.1 | | | ● | | | |
| | | WBGT030101L-JS | 0.1 | | | ● | | | |
| | | WBGT030102R-JS | 0.2 | | | ● | | | |
| | | WBGT030102L-JS | 0.2 | | | ● | | | |
| | | WBGT030104R-JS | 0.4 | | | ● | | | |
| | | WBGT030104L-JS | 0.4 | | | ● | | | |
| For internal turning on small lathes (Sharp edge) | JS | WBGT030101FL-JS | 0.1 | | ● | | | | |
| | | WBGT030101FR-JS | 0.1 | | ● | | | | |
| | | WBGT030102FL-JS | 0.2 | | ● | | | | |
| | | WBGT030102FR-JS | 0.2 | | ● | | | | |
| | | WBGT030104FL-JS | 0.4 | | ● | | | | |
| | | WBGT030104FR-JS | 0.4 | | ● | | | | |

● : Line-up

Internal toolholders → B286 Top-borer tools → F173 -

# TurnLine - Insert

## POSITIVE TYPE

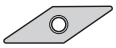


**Trigon, 80° with hole Positive 11°**

| | | |
|---|---|---|
| P | Steel | ●c ✣● c |
| M | Stainless | ●c |
| K | Cast iron | ●c ●c |
| N | Non-ferrous | |
| S | Superalloys | ●c |
| H | Hard materials | |

| Application | Chipbreaker | Designation | Corner radius | Coating T9115 | Coating T9125 | Coating AH120 |
|---|---|---|---|---|---|---|
| Heavy cutting | ML | WPMT090725ZPR-ML | 2.5 | ● | ● | ● |
| | | WPMT090725ZPL-ML | 2.5 | ● | ● | ● |





**Rhombic, 35° with hole Positive 5°**

| | | |
|---|---|---|
| P | Steel | ●c ✣● c ●c ●c |
| M | Stainless | c |
| K | Cast iron | ●c c ●c ●c |
| N | Non-ferrous | |
| S | Superalloys | ● |
| H | Hard materials | |

| Application | Chipbreaker | Designation | Corner radius | Coating T9115 | Coating T9125 | Coating AH725 | Coated cermet GT9530 | Cermet NS9530 |
|---|---|---|---|---|---|---|---|---|
| Finishing | PSF | VBMT110302-PSF | 0.2 | | | ● | ● | ● |
| | | VBMT110304-PSF | 0.4 | ● | ● | ● | ● | ● |
| | | VBMT160402-PSF | 0.2 | | | ● | ● | ● |
| | | VBMT160404-PSF | 0.4 | ● | ● | ● | ● | ● |
| | PF | VBMT110302-PF | 0.2 | | | | ● | ● |
| | | VBMT110304-PF | 0.4 | | | | ● | ● |
| | | VBMT110308-PF | 0.8 | | | | ● | ● |
| | | VBMT160404-PF | 0.4 | | | | ● | ● |
| | | VBMT160408-PF | 0.8 | | ● | | ● | ● |





● : Line-up

WPMT... : External toolholders → **B257**

VBMT... : External toolholders → **B217**, Internal toolholders → **B282 -**, J series toolholders → **B337 - B340**

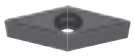
● : Continuous cutting
ɔ : Light interrupted cutting
✣ : Heavy interrupted cutting

## POSITIVE TYPE



**Rhombic, 35° with hole Positive 5°**

| | | |
|---|---|---|
| P | Steel | ●ɔ ɔ✣ ɔ ✣ ɔ✣ ✣ |
| M | Stainless | ● ɔ ɔ ✣ |
| K | Cast iron | ●ɔ ●ɔ ɔ |
| N | Non-ferrous | |
| S | Superalloys | ●ɔ ● |
| H | Hard materials | |

| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | | | | | | Coated cermet | | | | Cermet | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9115 | T9125 | T6120 | T6130 | AH630 | AH645 | T515 | T5115 | AH120 | AH725 | | | | | GT9530 | | | | NS9530 | | | |
| Finishing to light cutting | **PSS** | **VBMT110304-PSS** | 0.4 | ● | ● | ● | ● | ● | ● | | | | ● | | | | | ● | | | | ● | | | |
| |  | **VBMT110308-PSS** | 0.8 | ● | ● | ● | ● | ● | ● | | | | ● | | | | | ● | | | | ● | | | |
| | | **VBMT160404-PSS** | 0.4 | ● | ● | ● | ● | ● | ● | | | | ● | | | | | ● | | | | ● | | | |
| | | **VBMT160408-PSS** | 0.8 | ● | ● | ● | ● | ● | ● | | | | ● | | | | | ● | | | | ● | | | |
| | | **VBMT160412-PSS** | 1.2 | ● | ● | | | | | | | | ● | | | | | | | | | | | | |
| Finishing to medium cutting | **PS** | **VBMT110302-PS** | 0.2 | ● | ● | ● | ● | ● | ● | | | | ● | | | | | ● | | | | ● | | | |
| |  | **VBMT110304-PS** | 0.4 | ● | ● | ● | ● | ● | ● | | | ● | ● | | | | | ● | | | | ● | | | |
| | | **VBMT110308-PS** | 0.8 | ● | ● | ● | ● | ● | ● | | | ● | ● | | | | | ● | | | | ● | | | |
| | | **VBMT160402-PS** | 0.2 | ● | ● | ● | ● | ● | ● | | | | ● | | | | | ● | | | | ● | | | |
| | | **VBMT160404-PS** | 0.4 | ● | ● | ● | ● | ● | ● | | | ● | ● | | | | | ● | | | | ● | | | |
| | | **VBMT160408-PS** | 0.8 | ● | ● | ● | ● | ● | ● | | | ● | ● | | | | | ● | | | | ● | | | |
| Medium cutting | **24** | **VBMT160404-24** | 0.4 | ● | ● | | | | | | | | | | | | | | | | | ● | | | |
| |  | **VBMT160408-24** | 0.8 | ● | ● | | | | | | | | | | | | | | | | | ● | | | |
| Finishing to medium cutting | **CM** | **VBMT110304-CM** | 0.4 | | | | | | | | ● | | | | | | | | | | | | | | |
| |  | **VBMT110308-CM** | 0.8 | | | | | | | | ● | | | | | | | | | | | | | | |
| | | **VBMT160404-CM** | 0.4 | | | | | | | ● | ● | | | | | | | | | | | | | | |
| | | **VBMT160408-CM** | 0.8 | | | | | | | ● | ● | | | | | | | | | | | | | | |
| | | **VBMT160412-CM** | 1.2 | | | | | | | ● | ● | | | | | | | | | | | | | | |

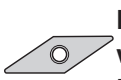
● : Line-up

External toolholders → **B217** Internal toolholders → **B282 -**
J series toolholders → **B337 - B340**

# TurnLine - Insert

● : Continuous cutting
◐ : Light interrupted cutting
✣ : Heavy interrupted cutting

## POSITIVE TYPE



**Rhombic, 35° with hole Positive 5°**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ◐ | ●◐ | ●◐ | ●◐ | | | | ●◐ | | | | ●◐ | | | | ● | | | | | | | | | | | | | | |
| M | Stainless | ◐ | ●◐ | ●◐ | ●◐ | | | | | | | | | | | | ● | | | | | | | | | | | | | | |
| K | Cast iron | ◐ | | | | | | | ●◐ | | | | ●◐ | | | | ● | | | | | | | | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | ● | | | | | | | | | | | | | | |
| S | Superalloys | ● | | ●◐ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

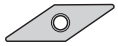
| Application | Chipbreaker | Designation | Corner radius | Coating AH725 | Coating SH725 | Coating SH730 | Coating J740 | Coated cermet J9530 | Cermet NS9530 | Uncoated TH10 |
|---|---|---|---|---|---|---|---|---|---|---|
| For external turning on small lathes (Sharp edge) | JS | VBGT110300FN-JS | 0.03 | | ● | ● | | | | |
| | | VBGT110301FN-JS | 0.1 | | ● | ● | | | | |
| | | VBGT110302FN-JS | 0.2 | | ● | ● | | | | |
| | | VBGT110304FN-JS | 0.4 | | ● | ● | | | | |
| For external turning on small lathes | JS | VBGT110301N-JS | 0.1 | ● | | | | | | |
| | | VBGT110302N-JS | 0.2 | ● | | | | | | |
| | | VBGT110304N-JS | 0.4 | ● | | | | | | |
| For external turning on small lathes (Sharp edge) | J10 | VBGT110300FR-J10 | 0.03 | | ● | | ● | | | ● |
| | | VBGT110300FL-J10 | 0.03 | | ● | | ● | | | ● |
| | | VBGT110301FR-J10 | 0.1 | | ● | | ● | | ● | ● |
| | | VBGT110301FL-J10 | 0.1 | | ● | | ● | | ● | ● |
| | | VBGT110302FR-J10 | 0.2 | | ● | | ● | | ● | ● |
| | | VBGT110302FL-J10 | 0.2 | | ● | | ● | | ● | ● |
| | | VBGT110304FR-J10 | 0.4 | | ● | | ● | | ● | ● |
| | | VBGT110304FL-J10 | 0.4 | | ● | | ● | | ● | ● |
| On small lathes (Honed edge) | J10 | VBGT110302R-J10 | 0.2 | | | | | ● | | |
| | | VBGT110302L-J10 | 0.2 | | | | | ● | | |
| | | VBGT110304R-J10 | 0.4 | | | | | ● | | |
| | | VBGT110304L-J10 | 0.4 | | | | | ● | | |

● : Line-up

External toolholders → B217 Internal toolholders → B282 -
J series toolholders → B337 - B340

● : Continuous cutting
c : Light interrupted cutting
✣ : Heavy interrupted cutting

## POSITIVE TYPE



**Rhombic, 35° with hole**
**Positive 7°**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ●c | c✣ | c | ✣ | c✣ | ✣ | ●c | c | | | | | | | ●c | | | | ●c | | | | | | | | |
| M | Stainless | | | ● | c | c | ✣ | ●c | c | ● | c | | | | | | | | | | | | | | | | | |
| K | Cast iron | ●c | | | | | | ●c | c | | | | | | | ●c | | | | ●c | | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S | Superalloys | | | | | | | ●c | ● | ● | c | c | | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | | | |

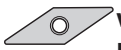
| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | | | | | | | | Coated cermet | | | | Cermet | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9115 | T9125 | T6120 | T6130 | AH630 | AH645 | AH120 | AH725 | AH8005 | AH8015 | AH905 | | GT9530 | | | | NS9530 | | | | | | | | |
| Finishing | **PSF** | **VCMT080202-PSF** | 0.2 | | | | | | | | ● | | | | | ● | | | | ● | | | | | | | | |
| | | **VCMT080204-PSF** | 0.4 | ● | ● | | | | | | ● | | | | | ● | | | | ● | | | | | | | | |
| | | **VCMT110302-PSF** | 0.2 | | | | | | | | ● | | | | | | | | | | | | | | | | | |
| | | **VCMT110304-PSF** | 0.4 | ● | ● | | | | | | ● | | | | | | | | | | | | | | | | | |
| | | **VCMT160404-PSF** | 0.4 | ● | ● | | | | | | ● | ● | ● | ● | | ● | | | | ● | | | | | | | | |
| | | **VCMT160408-PSF** | 0.8 | ● | ● | | | | | | ● | ● | ● | ● | | ● | | | | ● | | | | | | | | |
| | **PF** | **VCMT080202-PF** | 0.2 | | | | | | | | | | | | | ● | | | | ● | | | | | | | | |
| | | **VCMT080204-PF** | 0.4 | | | | | | | | | | | | | ● | | | | ● | | | | | | | | |
| | | **VCMT160404-PF** | 0.4 | | | | | | | | | | | | | ● | | | | ● | | | | | | | | |
| | | **VCMT160408-PF** | 0.8 | | | | | | | | | | | | | ● | | | | ● | | | | | | | | |
| Finishing to light cutting | **PSS** | **VCMT110304-PSS** | 0.4 | ● | ● | ● | ● | ● | ● | | ● | | | | | ● | | | | ● | | | | | | | | |
| | | **VCMT110308-PSS** | 0.8 | ● | ● | ● | ● | ● | ● | | ● | | | | | ● | | | | ● | | | | | | | | |
| | | **VCMT160404-PSS** | 0.4 | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | | ● | | | | ● | | | | | | | | |
| | | **VCMT160408-PSS** | 0.8 | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | | ● | | | | ● | | | | | | | | |
| Finishing to medium cutting | **PS** | **VCMT110302-PS** | 0.2 | ● | ● | ● | ● | ● | ● | | ● | | | | | ● | | | | ● | | | | | | | | |
| | | **VCMT110304-PS** | 0.4 | ● | ● | ● | ● | ● | ● | | ● | | | | | ● | | | | ● | | | | | | | | |
| | | **VCMT110308-PS** | 0.8 | ● | ● | ● | ● | ● | ● | | ● | | | | | ● | | | | ● | | | | | | | | |
| | | **VCMT160404-PS** | 0.4 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | | | | ● | | | | | | | | |
| | | **VCMT160408-PS** | 0.8 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | | | | ● | | | | | | | | |

● : Line-up

External toolholders → **B245 -** Internal toolholders → **B282 -**

● : Continuous cutting
◐ : Light interrupted cutting
✣ : Heavy interrupted cutting

## POSITIVE TYPE



**Rhombic, 35° with hole Positive 7°**

| | | |
|---|---|---|
| P | Steel | ●◐ ◐✣ ◐ ✣ |
| M | Stainless | ● ◐ |
| K | Cast iron | ●◐ ●◐ ◐ ●◐ ● |
| N | Non-ferrous | ● |
| S | Superalloys | ● ◐ ◐ ● |
| H | Hard materials | |

| Application | Chipbreaker | Designation | Corner radius | Coating T9115 | Coating T9125 | Coating T515 | Coating T5115 | Coating AH8005 | Coating AH8015 | Coating AH905 | Cermet NS9530 | Uncoated KS05F |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Finishing to medium cutting | **24** | **VCMT160404-24** | 0.4 | ● | ● | | | | | | ● | |
| | | **VCMT160408-24** | 0.8 | ● | ● | | | | | | ● | |
| | **CM** | **VCMT080204-CM** | 0.4 | | | | ● | | | | | |
| | | **VCMT160404-CM** | 0.4 | | | ● | ● | | | | | |
| | | **VCMT160408-CM** | 0.8 | | | ● | ● | | | | | |
| | | **VCMT160412-CM** | 1.2 | | | | ● | | | | | |
| Medium cutting | **All-round** | **VCMT160404** | 0.4 | | | | | ● | ● | ● | | |
| | | **VCMT160408** | 0.8 | | | | | ● | ● | ● | | |
| | | **VCMT160412** | 1.2 | | | | | ● | ● | ● | | |
| Finishing to medium cutting | **AL** | **VCGT160404-AL** | 0.4 | | | | | | | | | ● |
| | | **VCGT160408-AL** | 0.8 | | | | | | | | | ● |
| | | **VCGT160412-AL** | 1.2 | | | | | | | | | ● |
| | | **VCGT220520-AL** | 2.0 | | | | | | | | | ● |
| | | **VCGT220530-AL** | 3.0 | | | | | | | | | ● |

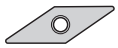
● : Line-up

VC*T... : External toolholders → **B245 -**, Internal toolholders → **B282 -**

VPET... : J series toolholders → **B341**

● : Continuous cutting
ⓒ : Light interrupted cutting
✣ : Heavy interrupted cutting

## POSITIVE TYPE



**Rhombic, 35° with hole Positive 11°**

| | | |
|---|---|---|
| P | Steel | ●ⓒ●ⓒ |
| M | Stainless | ●ⓒ●ⓒ |
| K | Cast iron | |
| N | Non-ferrous | |
| S | Superalloys | ●ⓒ |
| H | Hard materials | |

| Application | Chipbreaker | Designation | Corner radius | Coating SH725 | Coating SH730 |
|---|---|---|---|---|---|
| For external turning on small lathes (Sharp edge) | JPP | VPET0802008MFR-JPP | <0.08* | ● | ● |
| | | VPET0802008MFL-JPP | <0.08* | ● | ● |
| | | VPET080201MFR-JPP | <0.1* | ● | ● |
| | | VPET080201MFL-JPP | <0.1* | ● | ● |
| | | VPET0802018MFR-JPP | <0.18* | ● | ● |
| | | VPET0802018MFL-JPP | <0.18* | ● | ● |
| | | VPET080202MFR-JPP | <0.2* | ● | ● |
| | | VPET080202MFL-JPP | <0.2* | ● | ● |
| | | VPET1103008MFR-JPP | <0.08* | ● | ● |
| | | VPET1103008MFL-JPP | <0.08* | ● | ● |
| | | VPET110301MFR-JPP | <0.1* | ● | ● |
| | | VPET110301MFL-JPP | <0.1* | ● | ● |
| | | VPET1103018MFR-JPP | <0.18* | ● | ● |
| | | VPET1103018MFL-JPP | <0.18* | ● | ● |
| | | VPET110302MFR-JPP | <0.2* | ● | ● |
| | | VPET110302MFL-JPP | <0.2* | ● | ● |
| | JRP | VPET0802008MFR-JRP | <0.08* | ● | ● |
| | | VPET0802008MFL-JRP | <0.08* | ● | ● |
| | | VPET080201MFR-JRP | <0.1* | ● | ● |
| | | VPET080201MFL-JRP | <0.1* | ● | ● |
| | | VPET0802018MFR-JRP | <0.18* | ● | ● |
| | | VPET0802018MFL-JRP | <0.18* | ● | ● |
| | | VPET080202MFR-JRP | <0.2* | ● | ● |
| | | VPET080202MFL-JRP | <0.2* | ● | ● |
| | | VPET1103008MFR-JRP | <0.08* | ● | ● |
| | | VPET1103008MFL-JRP | <0.08* | ● | ● |
| | | VPET110301MFR-JRP | <0.1* | ● | ● |
| | | VPET110301MFL-JRP | <0.1* | ● | ● |
| | | VPET1103018MFR-JRP | <0.18* | ● | ● |
| | | VPET1103018MFL-JRP | <0.18* | ● | ● |
| | | VPET110302MFR-JRP | <0.2* | ● | ● |
| | | VPET110302MFL-JRP | <0.2* | ● | ● |
| For external turning on small lathes (Sharp edge) | JSP | VPET0802008MFN-JSP | <0.08* | ● | ● |
| | | VPET080201MFN-JSP | <0.1* | ● | ● |
| | | VPET0802018MFN-JSP | <0.18* | ● | ● |
| | | VPET080202MFN-JSP | <0.2* | ● | ● |
| | | VPET1103008MFN-JSP | <0.08* | ● | ● |
| | | VPET110301MFN-JSP | <0.1* | ● | ● |
| | | VPET1103018MFN-JSP | <0.18* | ● | ● |
| | | VPET110302MFN-JSP | <0.2* | ● | ● |

* Corner radius has minus tolerance.

● : Line-up

● : Continuous cutting
c : Light interrupted cutting
✣ : Heavy interrupted cutting

## POSITIVE TYPE



**Rhombic, 25° with hole Positive 7°**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | c✣ | | | | ●c | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M | Stainless | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| K | Cast iron | | | | | ●c | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S | Superalloys | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | Coating | | | Coated cermet | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | T9125 | | | GT9530 | | |
| Finishing to medium cutting | ZF | YWMT11T202-ZF | 0.2 | ● | | | ● | | |
| |  | YWMT11T204-ZF | 0.4 | ● | | | ● | | |
| | | YWMT16T302-ZF | 0.2 | ● | | | ● | | |
| | | YWMT16T304-ZF | 0.4 | ● | | | ● | | |
| | | YWMT16T308-ZF | 0.8 | ● | | | ● | | |
| | ZM | YWMT11T204-ZM | 0.4 | ● | | | ● | | |
| |  | YWMT16T304-ZM | 0.4 | ● | | | ● | | |
| | | YWMT16T308-ZM | 0.8 | ● | | | ● | | |

● : Line-up

External toolholders → B219, B220
Internal toolholders → B300

● : Continuous cutting
ɔ : Light interrupted cutting
✣ : Heavy interrupted cutting

## POSITIVE TYPE DOUBLE-SIDED



**Trigon, 80° with hole**

| | | |

● : Continuous cutting
ɔ : Light interrupted cutting
✣ : Heavy interrupted cutting

## POSITIVE TYPE DOUBLE-SIDED



**Rhombic, 55° with hole**

| | | |
|---|---|---|
| P | Steel | ɔ ●ɔ |
| M | Stainless | ɔ ●ɔ |
| K | Cast iron | ɔ |
| N | Non-ferrous | |
| S | Superalloys | ● |
| H | Hard materials | |

| Application | Chipbreaker | Designation | Corner radius | Coating AH725 | Coating SH725 |
|---|---|---|---|---|---|
| Finishing (Sharp edge) | JRP  | DXGU070301MFRE-JRP | <0.1* | | ● |
| | | DXGU070301MFLE-JRP | <0.1* | | ● |
| | | DXGU070302MFRE-JRP | <0.2* | | ● |
| | | DXGU070302MFLE-JRP | <0.2* | | ● |
| Finishing to medium cutting (Sharp edge) | JTS  | DXGU070301MFR-JTS | <0.1* | | ● |
| | | DXGU070301MFL-JTS | <0.1* | | ● |
| | | DXGU070302MFR-JTS | <0.2* | | ● |
| | | DXGU070302MFL-JTS | <0.2* | | ● |
| Finishing to medium cutting | JTS  | DXGU070301MR-JTS | <0.1* | ● | |
| | | DXGU070301ML-JTS | <0.1* | ● | |
| | | DXGU070302MR-JTS | <0.2* | ● | |
| | | DXGU070302ML-JTS | <0.2* | ● | |
| Finishing (Low cutting force) (Sharp edge) | JSS  | DXGU070301MFR-JSS | <0.1* | | ● |
| | | DXGU070301MFL-JSS | <0.1* | | ● |
| | | DXGU070302MFR-JSS | <0.2* | | ● |
| | | DXGU070302MFL-JSS | <0.2* | | ● |

* Corner radius has minus tolerance.

● : Line-up

External toolholders → B190 -
Internal toolholders → B268, B269

● : Continuous cutting
ɔ : Light interrupted cutting
✣ : Heavy interrupted cutting

## POSITIVE TYPE DOUBLE-SIDED

### Rhombic, 55° with hole

| | | |
|---|---|---|
| P | Steel | ɔ ●ɔ ●ɔ |
| M | Stainless | ɔ ●ɔ ●ɔ |
| K | Cast iron | ɔ ●ɔ ●ɔ ● |
| N | Non-ferrous | ● |
| S | Superalloys | ● ● |
| H | Hard materials | |

| Application | Chipbreaker | Designation | Corner radius | Coating: AH725 | Coated cermet: GT9530 | Cermet: NS9530 | Uncoated: KS05F |
|---|---|---|---|---|---|---|---|
| Finishing (Low cutting force) | JSS | DXGU070301MR-JSS | <0.1* | ● | | | |
| |  | DXGU070301ML-JSS | <0.1* | ● | | | |
| | | DXGU070302MR-JSS | <0.2* | ● | | | |
| | | DXGU070302ML-JSS | <0.2* | ● | | | |
| Finishing to medium cutting | TS | DXGU070302R-TS | 0.2 | ● | ● | ● | ● |
| |  | DXGU070302L-TS | 0.2 | ● | ● | ● | ● |
| | | DXGU070304R-TS | 0.4 | ● | ● | ● | ● |
| | | DXGU070304L-TS | 0.4 | ● | ● | ● | ● |
| | | DXGU070308R-TS | 0.8 | ● | ● | ● | ● |
| | | DXGU070308L-TS | 0.8 | ● | ● | ● | ● |
| Finishing (Low cutting force) | SS | DXGU070302R-SS | 0.2 | ● | ● | ● | ● |
| |  | DXGU070302L-SS | 0.2 | ● | ● | ● | ● |
| | | DXGU070304R-SS | 0.4 | ● | ● | ● | ● |
| | | DXGU070304L-SS | 0.4 | ● | ● | ● | ● |

### Rhombic, 35° with hole

| | | |
|---|---|---|
| P | Steel | ●ɔ |
| M | Stainless | ●ɔ |
| K | Cast iron | |
| N | Non-ferrous | |
| S | Superalloys | |
| H | Hard materials | |

| Application | Chipbreaker | Designation | Corner radius | Coating: SH725 |
|---|---|---|---|---|
| Finishing (Sharp edge) | JRP | VXGU09T201MFRE-JRP | <0.1* | ● |
| |  | VXGU09T201MFLE-JRP | <0.1* | ● |
| | | VXGU09T202MFRE-JRP | <0.2* | ● |
| | | VXGU09T202MFLE-JRP | <0.2* | ● |

* Corner radius has minus tolerance.

● : Line-up

DXGU... : External toolholders → **B190 -**, Internal toolholders → **B268, B269**

VXGU... : External toolholders → **B192 - B194, B216**

● : Continuous cutting
ɔ : Light interrupted cutting
✣ : Heavy interrupted cutting

## POSITIVE TYPE



**Round, with hole Positive 7°**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ●ɔ | ɔ✣ | | ●ɔ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M | Stainless | | | | ●ɔ | ● | ɔ | | | | | | | | | | | | | | | | | | | | | | | | |
| K | Cast iron | ●ɔ | | ɔ | ●ɔ | | | | | | | | | ● | | | | | | | | | | | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | ● | | | | | | | | | | | | | | | | | |
| S | Superalloys | | | | ●ɔ | ● | ɔ | ɔ | | | | | | ● | | | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | | | | Uncoated | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9115 | T9125 | T5115 | AH120 | AH8005 | AH8015 | AH905 | | KS05F | | | | | | | | | | | | | | | | | | | |
| Finishing to medium cutting | **RS** | **RCMT10T3M0-RS** | - | ● | ● | | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | |
| |  | **RCMT1204M0-RS** | - | ● | ● | | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | |
| | | **RCMT1606M0-RS** | - | ● | ● | | ● | | | | | | | | | | | | | | | | | | | | | | | | |
| | | **RCMT2006M0-RS** | - | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | **RCMT2507M0-RS** | - | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | **CM** | **RCMT0502M0-CM** | - | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | |
| |  | **RCMT0602M0-CM** | - | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | **RCMT0803M0-CM** | - | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | |
| | **AL** | **RCGT0602M0-AL** | - | | | | | | | | | ● | | | | | | | | | | | | | | | | | | | |
| |  | **RCGT0803M0-AL** | - | | | | | | | | | ● | | | | | | | | | | | | | | | | | | | |
| | | **RCGT1003M0-AL** | - | | | | | | | | | ● | | | | | | | | | | | | | | | | | | | |

● : Line-up

External toolholders → **B232 -**

● : Continuous cutting
ɔ : Light interrupted cutting
✣ : Heavy interrupted cutting

## POSITIVE TYPE



**Round, with hole Positive 7°**

| | | |
|---|---|---|
| P | Steel | ●ɔ ɔ✣ ● ɔ ●ɔ ● |
| M | Stainless | ● ɔ ● |
| K | Cast iron | ●ɔ ●ɔ ● |
| N | Non-ferrous | ● |
| S | Superalloys | ● ɔ ɔ |
| H | Hard materials | |

| Application | Chipbreaker | Designation | Corner radius | Coating T9115 | Coating T9125 | Coating AH8005 | Coating AH8015 | Coating AH905 | Cermet NS9530 | Uncoated TH10 |
|---|---|---|---|---|---|---|---|---|---|---|
| Heavy cutting | 61 | RCMT0502M0-61 | - | ● | ● | | | | ● | ● |
| | | RCMT0602M0-61 | - | ● | ● | | | | ● | ● |
| | | RCMT0803M0-61 | - | ● | ● | | | | ● | ● |
| | 61 | RCMM1003M0-61 | - | ● | ● | ● | ● | ● | ● | ● |
| | | RCMM1204M0-61 | - | ● | ● | ● | ● | ● | ● | ● |
| | | RCMM1606M0-61 | - | ● | ● | | | | | ● |
| | | RCMM2006M0-61 | - | | ● | | | | | ● |
| | | RCMM2507M0-61 | - | | ● | | | | | |

| ød1 (mm) Designation | 0502M0 | 0602M0 | 0803M0 | 1003M0 | 10T3M0 | 1204M0 | 1606M0 | 2006M0 | 2507M0 |
|---|---|---|---|---|---|---|---|---|---|
| RC*T | 2.5 | 2.8 | 3.4 | 4.4 | 4.4 | 4.4 | 5.5 | 6.5 | 7.6 |
| RCMM | - | - | - | 3.6 | - | 4.2 | 5.2 | 6.5 | 7.2 |



**Special Round Insert**

| | | |
|---|---|---|
| P | Steel | ● |
| M | Stainless | ● |
| K | Cast iron | ● ɔ✣ |
| N | Non-ferrous | ● ɔ✣ |
| S | Superalloys | ɔ✣ |
| H | Hard materials | |

| Application | Chipbreaker | Designation | Corner radius | Uncoated TH10 | Uncoated KS20 |
|---|---|---|---|---|---|
| Medium cutting | - | RT05 | - | ● | |
| | | RT06 | - | ● | ● |
| | | RT08 | - | ● | |

● : Line-up

RC... : External toolholders → **B232 -**

RT... : External toolholders → **B251**

● : Continuous cutting
◐ : Light interrupted cutting
✣ : Heavy interrupted cutting

## POSITIVE TYPE



**Round, without hole**
**Positive 7°**

| | |
|---|---|
| P | Steel |
| M | Stainless |
| K | Cast iron |
| N | Non-ferrous |
| S | Superalloys |
| H | Hard materials |

| Application | Chipbreaker | Designation | Corner radius | Ceramics LX11 |
|---|---|---|---|---|
| Finishing | - | RCGX090800 | - | ● |
| | | RCGX120800 | - | ● |



● : Line-up

● : Continuous cutting
ⓒ : Light interrupted cutting
✣ : Heavy interrupted cutting

## POSITIVE TYPE

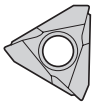


### Front turning Insert

| | | |

# TurnLine - Insert

## POSITIVE TYPE



**Back turning Insert**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ●c | ●c | | | | | ●c | | | | | ●c | | | | | ● | | | | | | | | | | | | | | | |
| M | Stainless | ●c | ●c | | | | | | | | | | | | | | | ● | | | | | | | | | | | | | | | |
| K | Cast iron | | | | | | | ●c | | | | | ●c | | | | | ● | | | | | | | | | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | ● | | | | | | | | | | | | | | | |
| S | Superalloys | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | Coated cermet | | | | | Cermet | | | | | Uncoated | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | SH725 | | J740 | | | J9530 | | | | | NS9530 | | | | | TH10 | | | | | | | | | | | | | | | |
| Back turning | - | JTBR3000F | 0.03 | ● | | ● | | | | | | | | | | | | | ● | | | | | | | | | | | | | | | |
| | | JTBL3000F | 0.03 | ● | | ● | | | | | | | | | | | | | ● | | | | | | | | | | | | | | | |
| | | JTBR3005F | 0.05 | ● | | ● | | | | | | | | | | | | | ● | | | | | | | | | | | | | | | |
| | | JTBL3005F | 0.05 | ● | | ● | | | | | | | | | | | | | ● | | | | | | | | | | | | | | | |
| | | JTBR3005 | 0.05 | | | ● | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | JTBL3005 | 0.05 | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | JTBR3010F | 0.1 | ● | | ● | | | | | | | | ● | | | | | ● | | | | | | | | | | | | | | | |
| | | JTBL3010F | 0.1 | ● | | ● | | | | | | | | ● | | | | | ● | | | | | | | | | | | | | | | |
| | | JTBR3010 | 0.1 | | | ● | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | JTBL3010 | 0.1 | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | JTBR3015F | 0.15 | ● | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | JTBL3015F | 0.15 | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |





**Back turning Insert**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ●c | ●c | | | | | ●c | | | | | ●c | | | | | ● | | | | | | | | | | | | | | | |
| M | Stainless | ●c | ●c | | | | | | | | | | | | | | | ● | | | | | | | | | | | | | | | |
| K | Cast iron | | | | | | | ●c | | | | | ●c | | | | | ● | | | | | | | | | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | ● | | | | | | | | | | | | | | | |
| S | Superalloys | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | Coating | | | | | Coated cermet | | | | | Cermet | | | | | Uncoated | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | SH725 | | J740 | | | J9530 | | | | | NS9530 | | | | | TH10 | | | | | | | | | | | | | | | |
| Back turning | - | J10ER005BF | 0.05 | ● | | ● | | | | | | | | ● | | | | | ● | | | | | | | | | | | | | | | |
| | | J10EL005BF | 0.05 | ● | | ● | | | | | | | | | | | | | ● | | | | | | | | | | | | | | | |
| | | J10ER005B | 0.05 | | | ● | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | J10EL005B | 0.05 | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | J10ER010BF | 0.1 | ● | | ● | | | | | | | | ● | | | | | ● | | | | | | | | | | | | | | | |
| | | J10EL010BF | 0.1 | ● | | ● | | | | | | | | | | | | | ● | | | | | | | | | | | | | | | |
| | | J10ER010B | 0.1 | | | ● | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | J10EL010B | 0.1 | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | J10EL015BF | 0.15 | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | J10ER015BF | 0.15 | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |



● : Line-up

JTB... : J series toolholders → **B347**

J10E...: J series toolholders → **B349**

● : Continuous cutting
◐ : Light interrupted cutting
✣ : Heavy interrupted cutting

## POSITIVE TYPE



**Back turning Insert**

| | | |
|---|---|---|
| P | Steel | ● |
| M | Stainless | ● |
| K | Cast iron | ● |
| N | Non-ferrous | ● |
| S | Superalloys | |
| H | Hard materials | |

| Application | Chipbreaker | Designation | Corner radius | Uncoated TH10 |
|---|---|---|---|---|
| Back turning | - | **10ER100B** | 0.03 | ● |
| |  | **10EL100B** | 0.03 | ● |
| | | **10ER150B** | 0.03 | ● |
| | | **10EL150B** | 0.03 | ● |
| | | **10ER300** | - | ● |
| | | **10EL300** | - | ● |

● : Line-up

Insert
Positive
OTHERS

J series toolholders → B349

# TurnLine - Designation System for T-CBN (PCBN) Inserts

## Multi-Corner type

**2 QP - CNGA120404 -L**

① ② ③ ④

① Number of corners

② Type

| | |
|---|---|
| QP | CBN Inserts |

③ ISO symbol

④ Special feature & chipbreaker

| | |
|---|---|
| Without | Standard honing |
| -L | Light honing angle<br>Wear resistance priority |
| -H | Heavy honing angle<br>Impact resistance priority |
| W | Wiper type insert |
| W□ | Round wiper type insert |
| F | Sharp edge |
| -HF | With chipbreaker |
| -HM | With chipbreaker |

## Multi-Corner type (10 inserts packing)

**T 2 QP - CNGA120408**

① "T" shows 10 inserts packing.

## For general turning

**TNGA160402 - QBN**

① ISO symbol

② CBN inserts

## T-CBN (PCBN tipped) grooving Inserts

**XG R 63 10 S - QBN**

① ② ③ ④ ⑤

① For grooving tool GX-type

② Hand of Insert

| | |
|---|---|
| L | Left |
| R | Right |

③ Groove width (mm)

| | |
|---|---|
| 10 | 1.0 |
| 15 | 1.5 |

④ Corner radius: $r_\varepsilon$ (mm)

| | |
|---|---|
| S | 0.2 |

⑤ CBN inserts

## For TUNGCUT

**S G N 200 - 020**

① ② ③ ④ ⑤

① Number of edge

| | |
|---|---|
| S | Single corner |

② Application

| | |
|---|---|
| G | Grooving |

③ For use

| | |
|---|---|
| N | Non breaker |

④ Groove width (mm)

| | |
|---|---|
| 200 | 2.0 |

⑤ Corner radius: $r_\varepsilon$ (mm)

| | |
|---|---|
| 020 | 0.2 |

# TurnLine - Designation System for T-DIA (PCD) Inserts

**Inserts for turning**

**TPGW110204 - DIA**

① ISO symbol

② PCD inserts



# TurnLine - T-CBN Inserts GNGA type

**GNGA**

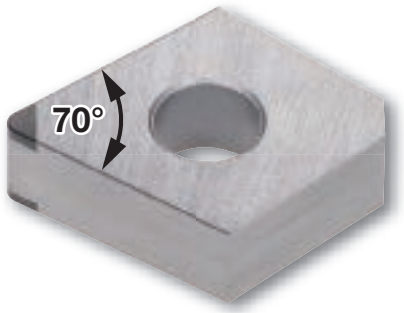
***Negative relief angle, G class, rhombic insert with 70° corner angle .***



## New shape CBN insert for general turning

- 70° corner angle makes large clearance between insert and workpiece.

- Large clearance reduces the cutting force and wear on edge, and provides smooth chip flow to prevent scratches on machined surface by chips.




## High versatility

- Standard toolholder for ISO CN**1204 insert is available.

- No need offsets compared to CN**1204 insert, due to same geometry of cutting edge position.

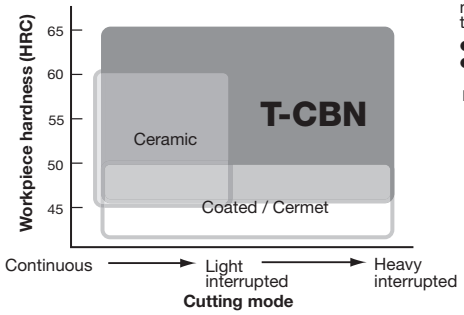
- Double sided insert with 2 cutting edges.

- 4 types of CBN grades are available for machining of a wide range of materials.



# H T-CBN series for machining hardened steels and hard materials

## Application area



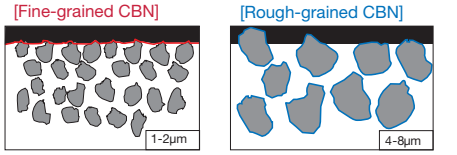

## Necessity of PCBN grades

The condition necessary to cut the work

material is:
Hardness of tool ≥ Hardness of tool X 3

- Hardened steel (60HRC) → 700 Hv
- Cemented carbide → 1600 Hv
- PCBN (BX360) → 3300 Hv

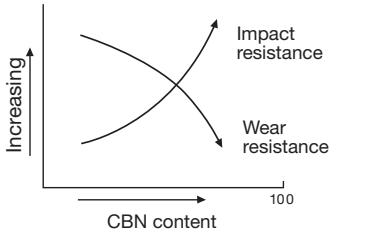
Effects of grain size of CBN on surface roughness and cutting speed




Fine grained PCBN provided with sharp cutting edge.
Good surface roughness

Rough grained PCBN. CBN particles are hold firmly.
Allows high speed machining

## Features of CBN grades for machining hardened steel and other hard materials




Fewer CBN content ⇨ Increasing wear resistance
Much CBN content ⇨ Increasing impact resistance

## Basic selection of T-CBN grades in machining of hardened steel and hard material

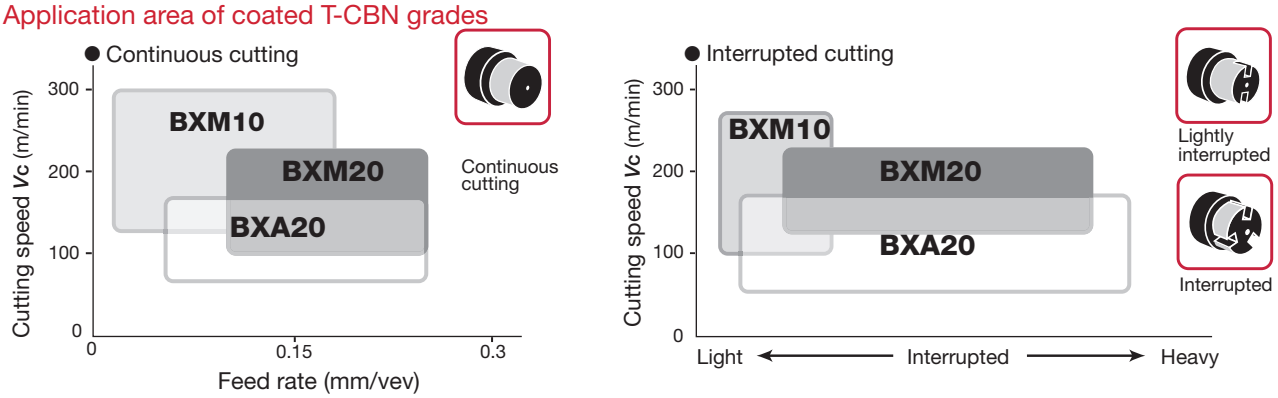
### ● Coated T-CBN grades

**BXM10** For high speeds cutting
**BXM20** For general purpose, more than *Vc* = 180 m/min
**BXA20** For general purpose, less than *Vc* = 180 m/min

### ● Uncoated T-CBN grades

**BX310** For high speeds / Priority on wear resistance in continuous cutting
**BX330** For medium speeds / Priority on surface quality
**BX360** For low to medium speeds / General purpose grade, excels in impact resistance
**BX380** For low to medium speeds / Priority on impact resistance in heavily interrupted cutting

## Application area of coated T-CBN grades




## Effects of Coated T-CBN grades



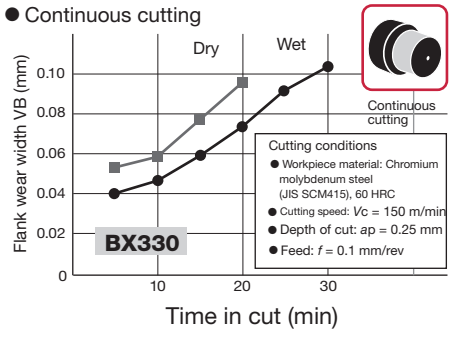
Coated on hard CBN
**Hardness:**
**CBN > Coating layer**

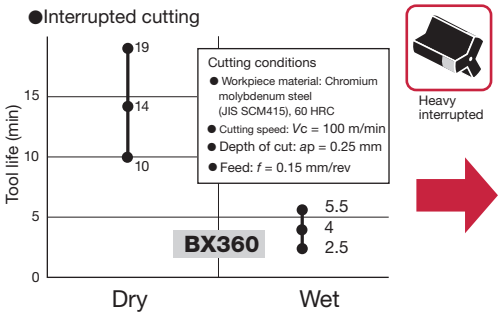
● **Protect CBN from oxidation wear**
Since the coating layer intercepts air, oxidation wear of CBN can be prevented.

● **Peeling of coating layer can be protected**
Hard and deformation resistant CBN is excellent substrate material.

→ **Improved resistance to flank wear**

## Effects of coolant in machining of hardened steel



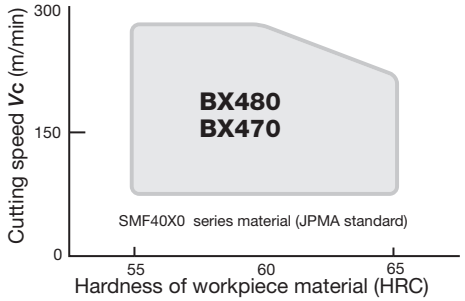




- In continuous cutting, wet cutting is superior to dry cutting in tool life for wear.
- In interrupted cutting, dry cutting is superior to wet cutting in tool life for fracture.

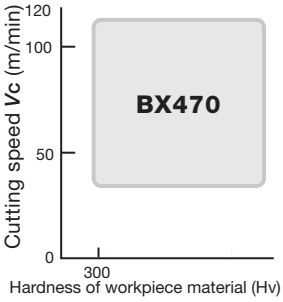
# T-CBN series for machining sintered metals

## Application area

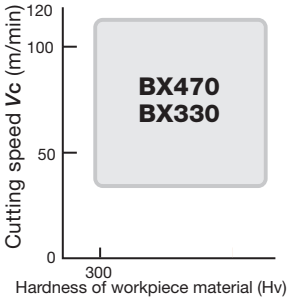
● Ferrous Sintered metal




● Valve seat (Plunge cutting)




● Valve seat (Traverse cutting)

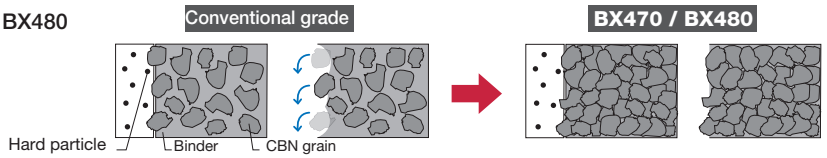



**BX470**
Priority on burr prevention and surface finish

**BX480**
Priority on wear resistance and versatility

## Features of BX470 and BX480

●Machining of Sintered metal including hard particles




Binder phase are selectively worn away by hard particles.
⇨ Wear proceeds with falling-out of CBN grains,

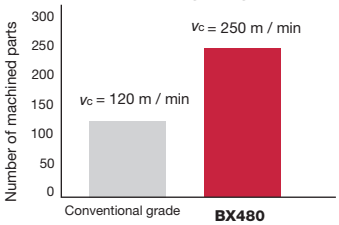
By increasing CBN content, wear of binder layer is suppressed.
⇨ Improved wear resistance

●Features of **BX470** and **BX480**

CBN content: 95 vol%
**Hv = 4100 ~ 4300**

The world highest CBN content as a commercially available material.

### ■ BX480 (Facing of gears)



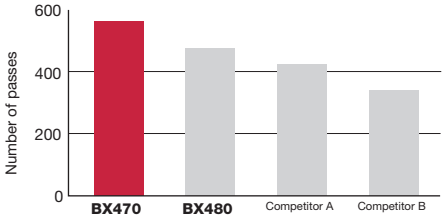

Cutting conditions
- Workpiece material: Sintered metal (> HRA60)
- Insert: DCMW11T308
- Depth of cut: ap = 0.2 ~ 0.5 mm
- Feed : f = 0.07 mm/rev
- Coolant : Water soluble type
- Interrupted cutting

### ■ BX470/BX480 Tool failure after machining Sintered metal




Cutting conditions
- Workpiece material: Sintered metal (> HRA60), Nitriding, Hard particles included
- Cutting speed: Vc = 110 m/min ● Depth of cut: ap = 0.15 mm
- Feed: f = 0.1 mm/rev ● Coolant : Water soluble type
- Interrupted cutting

### ■ BX470 (Tool life criterion: Burr occurrence)

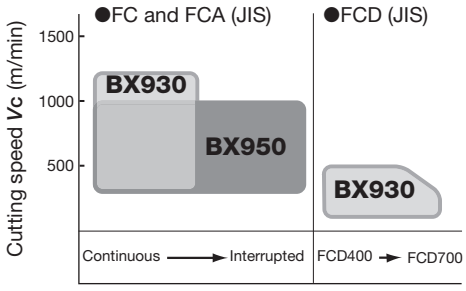



Cutting conditions
- Workpiece material: Ferrous Sintered metal
- Cutting speed: Vc = 100 m/min
- Depth of cut: ap = 0.15 ~ 0.3 mm
- Feed: f = 0.07 ~ 0.25 mm/rev
- Dry and interrupted cutting

# K T-CBN series for machining grey and ductile cast irons

## Application area

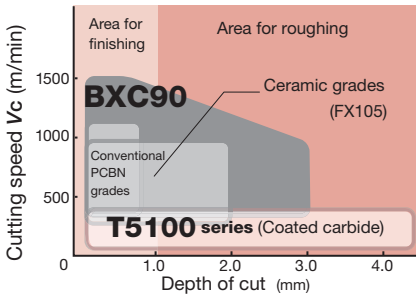
●FC and FCA (JIS) ●FCD (JIS)




**BX930**
- General purpose, first choice grade.
- Dedicated grade for machining ductile Cast iron

**BX950**
- Suitable for interrupted machining
- Excels in impact resistance

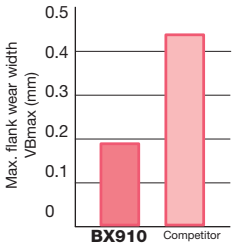
● Solid coated T-CBN grades




**BXC90**
- One-piece solid structure
- Applicable for small to large depths of cut

### ■ Machining of cylinder liners (Machining example of **BX910**)

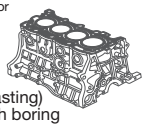
●Wear width after machining 120 pcs.




●Tool failure after machining 120 pcs.

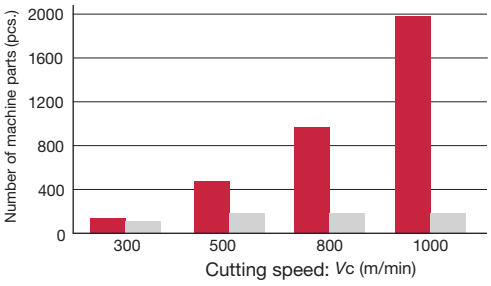



Cutting conditions



- Workpiece material: Cylinder liner (Spin casting) Machining type: Finish boring
- Cutting speed: Vc = 1,000 m/min
- Machine: Special purpose machine
- Coolant: Wet

### ■ Tool life comparison in machining of disc brakes




Cutting conditions
- Workpiece material: Disc rotor (JIS FC250)
- Insert: SNGN 120412 BXC90
- Depth of cut: ap = 0.7 mm
- Feed: f = 0.35 mm/rev
- Coolant: Dry
- Tool life criterion: Conditions of finished surface

**BX910** For machining cylinder liners

## Honing specifications

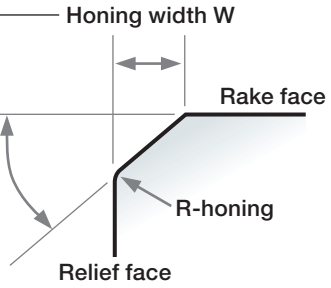
● T-CBN inserts with special honing specifications are made to order. Refer to the following description.

### Designation system for honing

Example:
Honing width: 0.15 mm
Honing angle: -30°
With R-honing

| S | 0 | 1 | 5 | 3 | 0 |
|---|---|---|---|---|---|

Shape | Honing width (W) | Honing angle (α)




T ··· Chamfered honing
S ··· Chamfered + R-honing
E ··· R-honing alone
F ··· Sharp edge

● Symbol

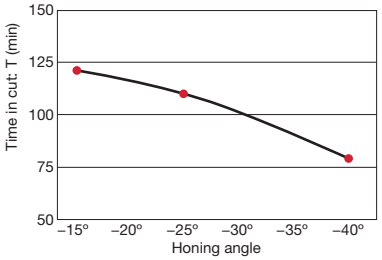
| W | Amount of honing (mm) |
|---|---|
| 005 | 0.05 |
| 010 | 0.10 |
| 013 | 0.13 |
| 015 | 0.15 |
| 020 | 0.20 |

| α | Honing angle |
|---|---|
| 10° | -10° |
| 15° | -15° |
| 20° | -20° |
| 25° | -25° |
| 30° | -30° |
| 35° | -35° |
| 40° | -40° |

● Honing specification can be selected in combination of items described here.
● Inserts with "R" honing alone are available.

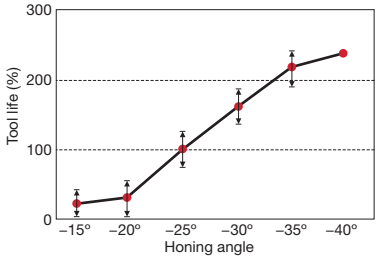
Honing specifications for machining hardened steels and other hard materials
Standard honing: -25° + R-honing
"-L" honing : -15° + R-honing
"-H" honing : -35° + R-honing

● Relationship between honing angle and tool life in continuous turning




**Cutting conditions**
Workpiece material:
Chromium molybdenum steel (JIS SCM415), 60 HRC
Insert: TNGN160404 BX360
Cutting speed: *Vc* = 100 m/min
Feed: *f* = 0.15 mm/rev
Depth of cut: *ap* = 0.25 mm
Coolant: Dry
Tool life criterion: VBmax = 0.15 mm
Honing: -□□°+ R-honing

● Relationship between honing angle and tool life in interrupted turning




**Cutting conditions**
Workpiece material:
Chromium molybdenum steel (JIS SCM415), 60 HRC
Insert: TNGN160404 BX360
Cutting speed: *Vc* = 100 m/min
Feed: *f* = 0.15 mm/rev
Depth of cut: *ap* = 0.25 mm
Coolant: Dry
Tool life criterion: Fracture
Honing: -□□°+ R-honing

● General rule
- For continuous cutting, small honing angle is favorable to minimize wear in general.
- For interrupted cutting, large honing angle is favorable to minimize fracture in general.

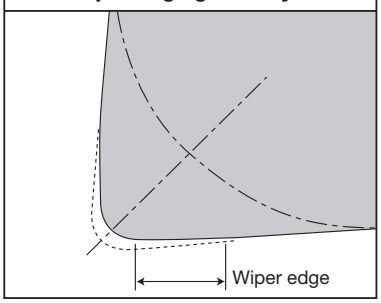
● Standard honing specifications

| Grades | BXM10 | BXM20 | BXA20 | BXC50 | BX310 | BX330 | BX360 | BX380 | BX470 | BX480 | BX910 | BX930 | BX950 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Negative insert | S01325 | S01325 | S01325 | S01325 | S01325 | S01325 | S01325 | S01325 | T01315 | S01325 | S01315 | S01315 | S01325 |
| Positive insert | S01325 | S01325 | S01325 | – | S00515 | S00515 | S00515 | – | T01315 | – | S01315 | S00515 | S00515 |

## Wiper insert

● A finishing edge (wiper edge) is formed at the point of intersection between corner radius and straight cutting edge.

**Wiper edge geometry**

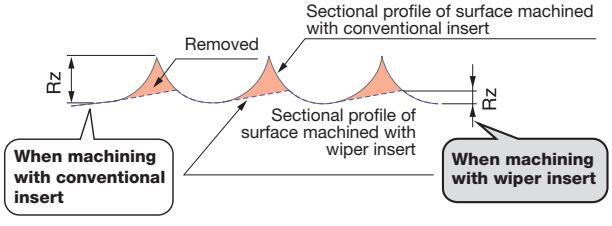



■ Effect of wiper edge

● Doubles the productivity → Reduced machining time
The wiper edge can double the feed rate and moreover does not deteriorate the surface roughness. (Note: Feed rate: *f* < 0.3 mm/rev)

● Superior surface roughness → By integrating roughing and finishing into one process, productivity can be increased.
Compared with conventional inserts only with corner radius, surface roughness can be improved with the wiper edge.

■ Profiles of surface roughness




■ Recommended toolholders for wiper-edged inserts

| | 2QP-CNGA1204**WL | 3QP-WNGA080408WL | 2QP-DNGA1504**WJ | 3QP-TNGA1604**WG |
|---|---|---|---|---|
| End cutting angle | 95° | | 93° | 91° |
| External toolholder | ACLNR/L**12-A | AWLNR/L**08-A | ADJNR/L**15-A | ATGNR/L**16-A<br>ATFNR/L**16-A |
| | DCLNR/L**12 | DWLNR/L**08 | DDJNR/L**15 | DTGNR/L**16<br>DTFNR/L**16 |
| Internal toolholder | A**-ACLNR/L12-D... | A**-AWLNR/L08-D... | A**-ADUNR/L15-D... | A**-ATFNR/L16-D... |

# TurnLine - CBN Insert

## Negative insert · Multi-corner type

● : Continuous cutting
◐ : Light interrupted cutting
✣ : Heavy interrupted cutting

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | P | Steel | | | | | | | | | | | | | |
| | | | | | M | Stainless | | | | | | | | | | | | | |
| | | | | | K | Cast iron | | | | | | | | | ◐ | ✣ | ◐ | ◐ | |
| | | | | | N | Non-ferrous | | | | | | | | | | | | | |
| | | | | | S | Superalloys | | | | | | | | | | | | | ● |
| | | | | | H | Hard materials | ● | ◐ | ◐ | ✣ | ● | ◐ | ◐ | ✣ | | | | | |
| | | | | | | Sintered metal | | | | | | | | | ◐ | ◐✣ | | | |
| Specification | Shape | Designation | Corner radius | No. of corner | CBN Length | BXM10 | BXM20 | BXA20 | BXC50 | BX310 | BX330 | BX360 | BX380 | BX470 | BX480 | BX930 | BX950 |
| Sharp edge | | 2QP-CNGA120404F | 0.4 | 2 | 2.3 | | | | | | | | | ● | | | |
| | | 2QP-CNGA120408F | 0.8 | 2 | 2.2 | | | | | | | | | ● | | | |
| General purpose | | 2QP-CNGA120404 | 0.4 | 2 | 2.3 | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | ● |
| | | 2QP-CNGA120408 | 0.8 | 2 | 2.2 | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | ● |
| | | 2QP-CNGA120412 | 1.2 | 2 | 2.4 | | ● | ● | | ● | ● | ● | ● | ● | ● | ● | ● |
| Light honing | | 2QP-CNGA120404-L | 0.4 | 2 | 2.3 | ● | ● | | | | ● | | | | | | |
| | | 2QP-CNGA120408-L | 0.8 | 2 | 2.2 | ● | ● | | | | ● | | | | | | |
| | | 2QP-CNGA120412-L | 1.2 | 2 | 2.4 | ● | ● | | | | ● | | | | | | |
| Heavy honing |  | 2QP-CNGA120404-H | 0.4 | 2 | 2.3 | | ● | | | | | ● | ● | | | | |
| | | 2QP-CNGA120408-H | 0.8 | 2 | 2.2 | | ● | ● | | | | ● | ● | | | | |
| | | 2QP-CNGA120412-H | 1.2 | 2 | 2.4 | | ● | | | | | ● | ● | | | | |
| Wiper edge | | 2QP-CNGA120404WL | 0.4 | 2 | 2.3 | ● | ● | | | | | | | | | | |
| | | 2QP-CNGA120408WL | 0.8 | 2 | 2.2 | ● | ● | ● | | | | | | | | | |
| | | 2QP-CNGA120412WL | 1.2 | 2 | 2.4 | ● | ● | | | | | | | | | | |
| | | 2QP-CNMA120404W | 0.4 | 2 | 2.3 | | | | | | ● | | | | | | |
| | | 2QP-CNMA120408W | 0.8 | 2 | 2.2 | | | | | | ● | | | | | | |
| | | 2QP-CNMA120412W | 1.2 | 2 | 2.4 | | | | | | ● | | | | | | |
| General purpose | | T2QP-CNGA120404 | 0.4 | 2 | 2.3 | | | | | | | ● | | | | | |
| | | T2QP-CNGA120408 | 0.8 | 2 | 2.2 | | | | | | | ● | | | | | |
| General purpose | | 4QP-CNGA120404 | 0.4 | 4 | 2.3 | | | | ● | | | | | | | | |
| | | 4QP-CNGA120408 | 0.8 | 4 | 2.2 | | | | ● | | | | | | | | |
| |  | 4QP-CNGA120412 | 1.2 | 4 | 2.4 | | | | ● | | | | | | | | |
| Wiper edge | | 4QP-CNMA120404W | 0.4 | 4 | 2.3 | | | | ● | | | | | | | | |
| | | 4QP-CNMA120408W | 0.8 | 4 | 2.2 | | | | ● | | | | | | | | |
| | | 4QP-CNMA120412W | 1.2 | 4 | 2.4 | | | | ● | | | | | | | | |
| General purpose Nose angle 70° |  | *2QP-GNGA120404 | 0.4 | 2 | 2.3 | | ● | ● | | | | ● | | | | | |
| | | *2QP-GNGA120408 | 0.8 | 2 | 2.2 | | ● | ● | | | | ● | | ● | | ● | |
| | | *2QP-GNGA120412 | 1.2 | 2 | 2.4 | | ● | ● | | | | ● | | ● | | ● | |
| General purpose | | 2QP-DNGA150404 | 0.4 | 2 | 2.5 | ● | ● | | | ● | ● | ● | ● | ● | ● | ● | ● |
| | | 2QP-DNGA150408 | 0.8 | 2 | 2.1 | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | ● |
| | | 2QP-DNGA150412 | 1.2 | 2 | 2.0 | ● | ● | | | ● | ● | ● | ● | | ● | ● | ● |
| Light honing | | 2QP-DNGA150404-L | 0.4 | 2 | 2.5 | ● | ● | | | | ● | | | | | | |
| | | 2QP-DNGA150408-L | 0.8 | 2 | 2.1 | ● | ● | | | | ● | | | | | | |
| | | 2QP-DNGA150412-L | 1.2 | 2 | 2.0 | | ● | | | | ● | | | | | | |
| Heavy honing |  | 2QP-DNGA150404-H | 0.4 | 2 | 2.5 | | ● | | | | | ● | ● | | | | |
| | | 2QP-DNGA150408-H | 0.8 | 2 | 2.1 | | ● | ● | | | | ● | ● | | | | |
| | | 2QP-DNGA150412-H | 1.2 | 2 | 2.0 | | ● | | | | | ● | ● | | | | |
| Wiper edge | | 2QP-DNGA150404WJ | 0.4 | 2 | 2.5 | ● | ● | ● | | | | | | | | | |
| | | 2QP-DNGA150408WJ | 0.8 | 2 | 2.1 | ● | ● | ● | | | | | | | | | |
| General purpose | | 2QP-DNGA150604 | 0.4 | 2 | 2.5 | ● | ● | | | | | | | | | | |
| | | 2QP-DNGA150608 | 0.8 | 2 | 2.1 | ● | ● | ● | | | | | | | | | |
| | | 2QP-DNGA150612 | 1.2 | 2 | 2.0 | ● | ● | | | | | | | | | | |

Note:
Letter "T" in the first position of designation shows that the standard packing quantity is 10 pieces.
Recommended toolholders for wiper inserts, W, WL, or WJ are shown on page **B162**

● : Line-up

* Tungaloy's original shape

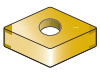
| | | | |
|---|---|---|---|
| External toolholders | → **B206 -** | Internal toolholders | → **B292 -** |
| J series toolholders | → **B342 -** | TungCap | → **B215, F046 -** |
| PINZBOHR® | → **F136 - F151** | Cartridges | → **F169 - F172** |

# TurnLine - CBN Insert

## Negative insert · Multi-corner type

● : Continuous cutting
◐ : Light interrupted cutting
✣ : Heavy interrupted cutting

| | | BXM10 | BXM20 | BXA20 | BXC50 | BX310 | BX330 | BX360 | BX380 | BX470 | BX480 | BX910 | BX930 | BX950 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | | | | | | | | | | | | | |
| M | Stainless | | | | | | | | | | | | | |
| K | Cast iron | | | | | | | | | ●◐ | ✣ | ● | ●◐ | ◐ |
| N | Non-ferrous | | | | | | | | | | | | | |
| S | Superalloys | | | | | | | | | | | | | ● |
| H | Hard materials | ● | ◐ | ◐ | ✣ | ● | ◐ | ◐ | ✣ | | | | | |
| | Sintered metal | | | | | | | | | ●◐ | ◐✣ | | | |

| Specification | Shape | Designation | Corner radius | No. of corner | CBN Length |
|---|---|---|---|---|---|
| General purpose |  | 4QP-DNGA150404 | 0.4 | 4 | 2.5 |
| | | 4QP-DNGA150408 | 0.8 | 4 | 2.1 |
| | | 4QP-DNGA150412 | 1.2 | 4 | 2.0 |
| General purpose |  | 2QP-SNGA120404 | 0.4 | 2 | 2.4 |
| | | 2QP-SNGA120408 | 0.8 | 2 | 2.4 |
| | | 2QP-SNGA120412 | 1.2 | 2 | 2.4 |
| Light honing | | 2QP-SNGA120404-L | 0.4 | 2 | 2.4 |
| | | 2QP-SNGA120408-L | 0.8 | 2 | 2.4 |
| | | 2QP-SNGA120412-L | 1.2 | 2 | 2.4 |
| Heavy honing | | 2QP-SNGA120404-H | 0.4 | 2 | 2.4 |
| | | 2QP-SNGA120408-H | 0.8 | 2 | 2.4 |
| | | 2QP-SNGA120412-H | 1.2 | 2 | 2.4 |
| General purpose |  | 4QP-SNGA120404 | 0.4 | 4 | 2.4 |
| | | 4QP-SNGA120408 | 0.8 | 4 | 2.4 |
| | | 4QP-SNGA120412 | 1.2 | 4 | 2.4 |
| General purpose |  | 2QP-SNGN090308 | 0.8 | 2 | 2.4 |
| | | 2QP-SNGN090312 | 1.2 | 2 | 2.4 |
| Sharp edge | | 3QP-TNGA160404F | 0.4 | 3 | 2.2 |
| | | 3QP-TNGA160408F | 0.8 | 3 | 1.9 |
| General purpose | | 3QP-TNGA160404 | 0.4 | 3 | 2.2 |
| | | 3QP-TNGA160408 | 0.8 | 3 | 1.9 |
| | | 3QP-TNGA160412 | 1.2 | 3 | 2.4 |
| Light honing |  | 3QP-TNGA160404-L | 0.4 | 3 | 2.2 |
| | | 3QP-TNGA160408-L | 0.8 | 3 | 1.9 |
| | | 3QP-TNGA160412-L | 1.2 | 3 | 2.4 |
| Heavy honing | | 3QP-TNGA160404-H | 0.4 | 3 | 2.2 |
| | | 3QP-TNGA160408-H | 0.8 | 3 | 1.9 |
| | | 3QP-TNGA160412-H | 1.2 | 3 | 2.4 |
| Wiper edge | | 3QP-TNGA160404WG | 0.4 | 3 | 2.2 |
| | | 3QP-TNGA160408WG | 0.8 | 3 | 1.9 |
| General purpose | | T3QP-TNGA160404 | 0.4 | 3 | 2.2 |
| | | T3QP-TNGA160408 | 0.8 | 3 | 1.9 |
| General purpose |  | 6QP-TNGA160404 | 0.4 | 6 | 2.2 |
| | | 6QP-TNGA160408 | 0.8 | 6 | 1.9 |
| | | 6QP-TNGA160412 | 1.2 | 6 | 2.4 |

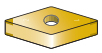
Note:
Letter “T” in the first position of designation shows that the standard packing quantity is 10 pieces.
Recommended toolholders for wiper inserts, WG are shown on page **B162**

● : Line-up

External toolholders → **B207 -**
J series toolholders → **B342 -**
Cartridges → **F152 -**
Internal toolholders → **B293 -**
TungCap → **B215, F046 -**

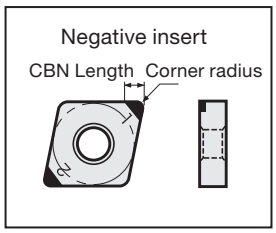
# TurnLine - CBN Insert

## Negative insert · Multi-corner type

| | | | | | | BXM10 | BXM20 | BXA20 | BXC50 | BX310 | BX330 | BX360 | BX380 | BX470 | BX480 | BX930 | BX950 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | P Steel | | | | | | | | | | | | | | | |
| | | M Stainless | | | | | | | | | | | | | | | |
| | | K Cast iron | | | | | | | | | | | | ●C | ✠ | ●C | C |
| | | N Non-ferrous | | | | | | | | | | | | | | | |
| | | S Superalloys | | | | | | | | | | | | | | | ● |
| | | H Hard materials | | | | ● | ●C | ●C | ✠ | ● | ●C | ●C | ✠ | | | | |
| | | Sintered metal | | | | | | | | | | | | ●C | C✠ | | |
| Specification | Shape | Designation | Corner radius | No. of corner | CBN Length | | | | | | | | | | | | |
| General purpose | | 2QP-VNGA160404 | 0.4 | 2 | 3.1 | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | ● |
| | | 2QP-VNGA160408 | 0.8 | 2 | 2.2 | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | ● |
| | | 2QP-VNGA160412 | 1.2 | 2 | 3.0 | | ● | | | | | | | | | | |
| Light honing |  | 2QP-VNGA160404-L | 0.4 | 2 | 3.1 | ● | ● | | | | ● | | | | | | |
| | | 2QP-VNGA160408-L | 0.8 | 2 | 2.2 | ● | ● | | | | ● | | | | | | |
| Heavy honing | | 2QP-VNGA160404-H | 0.4 | 2 | 3.1 | | ● | ● | | | | ● | ● | | | | |
| | | 2QP-VNGA160408-H | 0.8 | 2 | 2.2 | | ● | ● | | | | ● | ● | | | | |
| General purpose | | 4QP-VNGA160404 | 0.4 | 4 | 3.1 | | | | ● | | | | | | | | |
| |  | 4QP-VNGA160408 | 0.8 | 4 | 2.2 | | | | ● | | | | | | | | |
| Heavy honing | | 4QP-VNGA160408-H | 0.8 | 4 | 2.2 | | | | | | | | | | | | |
| General purpose | | 3QP-WNGA080408 | 0.8 | 3 | 2.2 | ● | ● | ● | | ● | ● | ● | ● | | ● | ● | ● |
| |  | | | | | | | | | | | | | | | | |
| Wiper edge | | 3QP-WNGA080408WL | 0.8 | 3 | 2.2 | ● | ● | | | | | | | | | | |
| General purpose |  | 6QP-WNGA080408 | 0.8 | 6 | 2.2 | | | | ● | | | | | | | | |

Recommended toolholders for wiper inserts, WL are shown on page **B162**

● : Line-up




External toolholders → **B206 -**
Internal toolholders → **B293 -**
TungCap → **B215, F046 -**

# TurnLine - CBN Insert

● : Continuous cutting
◐ : Light interrupted cutting
✣ : Heavy interrupted cutting

## Negative insert · Multi-corner type Hard Breaker (T-CBN insert with chipbreaker)

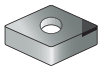
| | | |

# TurnLine - CBN Insert

● : Continuous cutting
◐ : Light interrupted cutting
✣ : Heavy interrupted cutting

## Negative insert · One-corner type

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | P | Steel | |
| | | | | | M | Stainless | |
| | | | | | K | Cast iron | |
| | | | | | N | Non-ferrous | |
| | | | | | S | Superalloys | |
| | | | | | H | Hard materials | ●◐ |

| Specification | Shape | Designation | Corner radius | No. of corner | CBN Length | BX360 |
|---|---|---|---|---|---|---|
| General purpose |  | **CNGA120402-QBN** | 0.2 | 1 | 4.1 | ● |
| | | **CNGA120404-QBN** | 0.4 | 1 | 4.0 | ● |
| | | **CNGA120408-QBN** | 0.8 | 1 | 3.9 | ● |
| | | **CNGA120412-QBN** | 1.2 | 1 | 3.9 | ● |
| |  | **DNGA150402-QBN** | 0.2 | 1 | 4.3 | ● |
| | | **DNGA150404-QBN** | 0.4 | 1 | 4.1 | ● |
| | | **DNGA150408-QBN** | 0.8 | 1 | 3.8 | ● |
| | | **DNGA150412-QBN** | 1.2 | 1 | 3.4 | ● |
| |  | **SNGA120402-QBN** | 0.2 | 1 | 4.1 | ● |
| | | **SNGA120404-QBN** | 0.4 | 1 | 4.1 | ● |
| | | **SNGA120408-QBN** | 0.8 | 1 | 4.1 | ● |
| | | **SNGA120412-QBN** | 1.2 | 1 | 4.1 | ● |
| |  | **TNGA160402-QBN** | 0.2 | 1 | 4.4 | ● |
| | | **TNGA160404-QBN** | 0.4 | 1 | 4.2 | ● |
| | | **TNGA160408-QBN** | 0.8 | 1 | 4.0 | ● |
| | | **TNGA160412-QBN** | 1.2 | 1 | 3.7 | ● |

● : Line-up


External toolholders → **B206 -**
J series toolholders → **B342 - B344**
Cartridges → **F152 -**
Internal toolholders → **B292 -**
PINZBOHR® → **F136 - F151**

# TurnLine - CBN Insert

## Positive insert · Multi-corner type (G class)

● : Continuous cutting
◐ : Light interrupted cutting
✣ : Heavy interrupted cutting

| | |
|---|---|
| P | Steel |
| M | Stainless |
| K | Cast iron |
| N | Non-ferrous |
| S | Superalloys |
| H | Hard materials |
| | Sintered metal |

| Specification | Shape | Designation | Corner radius | No. of corner | CBN Length | BXM10 | BXM20 | BXA20 | BX470 | BX910 |
|---|---|---|---|---|---|---|---|---|---|---|
| General purpose |  | 2QP-CCGW060202 | 0.2 | 2 | 2.3 | ● | ● | | | |
| | | 2QP-CCGW060204 | 0.4 | 2 | 2.3 | ● | ● | ● | ● | |
| | | 2QP-CCGW09T304 | 0.4 | 2 | 2.3 | ● | ● | ● | ● | |
| | | 2QP-CCGW09T308 | 0.8 | 2 | 2.2 | ● | ● | ● | ● | |
| General purpose |  | 2QP-DCGW070202 | 0.2 | 2 | 2.7 | ● | ● | ● | | |
| | | 2QP-DCGW070204 | 0.4 | 2 | 2.5 | ● | ● | ● | ● | |
| | | 2QP-DCGW070208 | 0.8 | 2 | 2.5 | | | | ● | |
| Sharp edge | | 2QP-DCGW11T302F | 0.2 | 2 | 2.7 | | | | ● | |
| | | 2QP-DCGW11T304F | 0.4 | 2 | 2.5 | | | | ● | |
| General purpose | | 2QP-DCGW11T302 | 0.2 | 2 | 2.7 | ● | ● | | | |
| | | 2QP-DCGW11T304 | 0.4 | 2 | 2.5 | ● | ● | | ● | |
| | | 2QP-DCGW11T308 | 0.8 | 2 | 2.1 | ● | ● | ● | ● | |
| General purpose |  | 2QP-SPGW09T308 | 0.8 | 2 | 2.4 | | | | | ● |
| | | 2QP-SPGW09T312 | 1.2 | 2 | 2.4 | | | | | ● |
| | | 2QP-SPGW120408 | 0.8 | 2 | 2.4 | | | | | ● |
| | | 2QP-SPGW120412 | 1.2 | 2 | 2.4 | | | | | ● |
| | | 2QP-SPGW120416 | 1.6 | 2 | 2.4 | | | | | ● |
| General purpose |  | 2QP-SPGN090308 | 0.8 | 2 | 2.4 | | | | | ● |
| | | 2QP-SPGN090312 | 1.2 | 2 | 2.4 | | | | | ● |
| General purpose |  | 3QP-TPGW080204 | 0.4 | 3 | 2.2 | ● | ● | | | |
| | | 3QP-TPGW090202 | 0.2 | 3 | 2.3 | | ● | | | |
| | | 3QP-TPGW090204 | 0.4 | 3 | 2.2 | ● | ● | | | |
| | | 3QP-TPGW110202 | 0.2 | 3 | 2.3 | | ● | | | |
| | | 3QP-TPGW110204 | 0.4 | 3 | 2.2 | ● | ● | | ● | |
| | | 3QP-TPGW110208 | 0.8 | 3 | 2.2 | | | | ● | |
| Sharp edge | | 3QP-TPGW110304F | 0.4 | 3 | 2.2 | | | | ● | |
| | | 3QP-TPGW110308F | 0.8 | 3 | 2.2 | | | | ● | |
| General purpose | | 3QP-TPGW110302 | 0.2 | 3 | 2.3 | | ● | | | |
| | | 3QP-TPGW110304 | 0.4 | 3 | 2.2 | ● | ● | ● | ● | |
| | | 3QP-TPGW110308 | 0.8 | 3 | 2.2 | ● | ● | ● | ● | ● |
| | | 3QP-TPGW130302 | 0.2 | 3 | 2.3 | | ● | | | |
| | | 3QP-TPGW130304 | 0.4 | 3 | 2.2 | ● | ● | | | |
| | | 3QP-TPGW16T304 | 0.4 | 3 | 2.2 | ● | ● | | | |
| | | 3QP-TPGW16T308 | 0.8 | 3 | 1.9 | ● | ● | | | |
| General purpose | | 3QP-TPGW160404 | 0.4 | 3 | 2.2 | ● | ● | | | |
| | | 3QP-TPGW160408 | 0.8 | 3 | 1.9 | | ● | | | |
| General purpose |  | 3QP-TPGN110308 | 0.8 | 3 | 2.2 | | | | | ● |
| | | 3QP-TPGN110312 | 1.2 | 3 | 2.4 | | | | | ● |

● : Line-up

External toolholders → B217 -
J series toolholders → B328 -
Cartridges → F152 -
Top-borer tools → F175
Internal toolholders → B278 -
PINZBOHR® → F136 - F151
Boring bar tools → F169 - F172

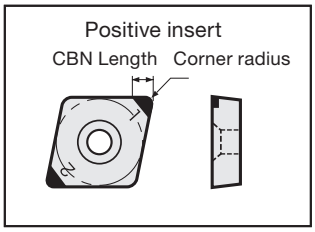
# TurnLine - CBN Insert

## Positive insert · Multi-corner type (G class)

| | |
|---|---|
| P | Steel |
| M | Stainless |
| K | Cast iron |
| N | Non-ferrous |
| S | Superalloys |
| H | Hard materials |

| Specification | Shape | Designation | Corner radius | No. of corner | CBN Length | BXM10 | BXM20 | BXA20 |
|---|---|---|---|---|---|---|---|---|
| General purpose |  | **2QP-VBGW110304** | 0.4 | 2 | 3.1 | ● | ● | ● |
| | | **2QP-VBGW110308** | 0.8 | 2 | 2.2 | ● | ● | ● |
| | | **2QP-VBGW160404** | 0.4 | 2 | 3.1 | ● | ● | ● |
| | | **2QP-VBGW160408** | 0.8 | 2 | 2.2 | ● | ● | ● |
| General purpose |  | **2QP-VCGW160404** | 0.4 | 2 | 3.1 | ● | ● | |

● : Line-up




Insert
PCD / CBN

External toolholders → **B217 -**
J series toolholders → **B337 -**
Internal toolholders → **B282 -**
TungCap → **F046 -**

# TurnLine - CBN Insert

## Positive insert · Multi-corner type

● : Continuous cutting
ɔ : Light interrupted cutting
✣ : Heavy interrupted cutting

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | P | Steel | | | | | | | | | | | | |
| | | | | | | | | | | | | M | Stainless | | | | | | | | | | | | |
| | | | | | | | | | | | | K | Cast iron | | | | ●ɔ | ɔ | | | | | | | |
| | | | | | | | | | | | | N | Non-ferrous | | | | | | | | | | | | |
| | | | | | | | | | | | | S | Superalloys | | | | | ● | | | | | | | |
| | | | | | | | | | | | | H | Hard materials | ● | ●ɔ | ●ɔ | | | | | | | | | |
| Specification | Shape | Designation | Corner radius | No. of corner | CBN Length | BX310 | BX330 | BX360 | BX930 | BX950 | | | | | | | | | | | | | | | |
| General purpose | | 2QP-CCMW060202 | 0.2 | 2 | 2.3 | ● | ● | ● | | | | | | | | | | | | | | | | | |
| | | 2QP-CCMW060204 | 0.4 | 2 | 2.3 | ● | ● | ● | ● | ● | | | | | | | | | | | | | | | |
| | | 2QP-CCMW09T304 | 0.4 | 2 | 2.3 | ● | ● | ● | ● | ● | | | | | | | | | | | | | | | |
| | | 2QP-CCMW09T308 | 0.8 | 2 | 2.2 | ● | ● | ● | | | | | | | | | | | | | | | | | |
| General purpose | | 2QP-DCMW070202 | 0.2 | 2 | 2.7 | ● | ● | ● | | | | | | | | | | | | | | | | | |
| | | 2QP-DCMW070204 | 0.4 | 2 | 2.5 | ● | ● | ● | ● | ● | | | | | | | | | | | | | | | |
| | | 2QP-DCMW11T302 | 0.2 | 2 | 2.7 | ● | ● | ● | | | | | | | | | | | | | | | | | |
| | | 2QP-DCMW11T304 | 0.4 | 2 | 2.5 | ● | ● | ● | ● | ● | | | | | | | | | | | | | | | |
| | | 2QP-DCMW11T308 | 0.8 | 2 | 2.1 | ● | ● | ● | | | | | | | | | | | | | | | | | |
| General purpose | | 2QP-SPMN090304 | 0.4 | 2 | 2.4 | | ● | ● | ● | | | | | | | | | | | | | | | | |
| | | 2QP-SPMN090308 | 0.8 | 2 | 2.4 | | ● | ● | ● | | | | | | | | | | | | | | | | |
| General purpose | | 3QP-TPMW080204 | 0.4 | 3 | 2.2 | ● | ● | ● | ● | | | | | | | | | | | | | | | | |
| | | 3QP-TPMW090202 | 0.2 | 3 | 2.3 | | ● | ● | ● | | | | | | | | | | | | | | | | |
| | | 3QP-TPMW090204 | 0.4 | 3 | 2.2 | ● | ● | ● | ● | | | | | | | | | | | | | | | | |
| | | 3QP-TPMW110202 | 0.2 | 3 | 2.3 | ● | ● | ● | ● | | | | | | | | | | | | | | | | |
| | | 3QP-TPMW110204 | 0.4 | 3 | 2.2 | ● | ● | ● | ● | | | | | | | | | | | | | | | | |
| | | 3QP-TPMW110302 | 0.2 | 3 | 2.3 | ● | ● | ● | ● | ● | | | | | | | | | | | | | | | |
| | | 3QP-TPMW110304 | 0.4 | 3 | 2.2 | ● | ● | ● | ● | ● | | | | | | | | | | | | | | | |
| | | 3QP-TPMW110308 | 0.8 | 3 | 1.9 | ● | ● | ● | ● | ● | | | | | | | | | | | | | | | |
| | | 3QP-TPMW130302 | 0.2 | 3 | 2.4 | ● | ● | ● | ● | ● | | | | | | | | | | | | | | | |
| | | 3QP-TPMW130304 | 0.4 | 3 | 2.2 | ● | ● | ● | ● | ● | | | | | | | | | | | | | | | |
| | | 3QP-TPMW16T304 | 0.4 | 3 | 2.2 | ● | ● | ● | ● | ● | | | | | | | | | | | | | | | |
| | | 3QP-TPMW16T308 | 0.8 | 3 | 1.9 | ● | | | | | | | | | | | | | | | | | | | |
| | | 3QP-TPMW160404 | 0.4 | 3 | 2.2 | ● | ● | ● | ● | | | | | | | | | | | | | | | | |
| | | 3QP-TPMW160408 | 0.8 | 3 | 1.9 | ● | ● | ● | ● | | | | | | | | | | | | | | | | |
| General purpose | | 3QP-TPMN110302 | 0.2 | 3 | 2.3 | | ● | ● | ● | ● | | | | | | | | | | | | | | | |
| | | 3QP-TPMN110304 | 0.4 | 3 | 2.2 | | ● | ● | ● | ● | | | | | | | | | | | | | | | |
| | | 3QP-TPMN110308 | 0.8 | 3 | 1.9 | | ● | ● | ● | ● | | | | | | | | | | | | | | | |
| | | 3QP-TPMN160304 | 0.4 | 3 | 2.2 | | ● | ● | ● | ● | | | | | | | | | | | | | | | |
| | | 3QP-TPMN160308 | 0.8 | 3 | 1.9 | | ● | ● | ● | ● | | | | | | | | | | | | | | | |
| General purpose | | 2QP-VBMW110304 | 0.4 | 2 | 3.1 | ● | ● | ● | ● | | | | | | | | | | | | | | | | |
| | | 2QP-VBMW110308 | 0.8 | 2 | 2.2 | ● | ● | ● | ● | | | | | | | | | | | | | | | | |
| | | 2QP-VBMW160404 | 0.4 | 2 | 3.1 | ● | ● | ● | | | | | | | | | | | | | | | | | |
| | | 2QP-VBMW160408 | 0.8 | 2 | 2.2 | ● | ● | ● | | | | | | | | | | | | | | | | | |
| General purpose | | 2QP-VCMW160404 | 0.4 | 2 | 3.1 | | ● | ● | ● | | | | | | | | | | | | | | | | |

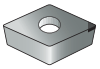
● : Line-up

External toolholders → B217 -
J series toolholders → B328 -
PINZBOHR® → F136 - F151
Boring bar tools → F169 - F172
Internal toolholders → B278 -
TungCap → F046 -
Cartridges → F152 -

# TurnLine - CBN Insert

## Positive insert · One-corner type

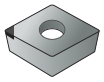
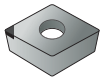
| | |
|---|---|
| P | Steel |
| M | Stainless |
| K | Cast iron |
| N | Non-ferrous |
| S | Superalloys |
| H | Hard materials |

| Specification | Shape | Designation | Corner radius | No. of corner | CBN Length | BX330 |
|---|---|---|---|---|---|---|
| | | | | | | ●◐ |
| General purpose |  | Q-CCMW060204 | 0.4 | 1 | 2.5 | ● |
| | | Q-CCMW09T304 | 0.4 | 1 | 2.5 | ● |
| General purpose |  | Q-DCMW070204 | 0.4 | 1 | 2.1 | ● |
| | | Q-DCMW11T304 | 0.4 | 1 | 2.1 | ● |
| General purpose |  | Q-SPGN090304 | 0.4 | 1 | 2.8 | ● |
| | | Q-SPGN090308 | 0.8 | 1 | 2.8 | ● |
| General purpose |  | Q-TPMW080204 | 0.4 | 1 | 2.2 | ● |
| | | Q-TPMW090202 | 0.2 | 1 | 2.4 | ● |
| | | Q-TPMW090204 | 0.4 | 1 | 2.3 | ● |
| | | Q-TPMW110202 | 0.2 | 1 | 2.4 | ● |
| | | Q-TPMW110204 | 0.4 | 1 | 2.2 | ● |
| | | Q-TPMW110304 | 0.4 | 1 | 2.3 | ● |
| | | Q-TPMW110308 | 0.8 | 1 | 2.2 | ● |
| | | Q-TPMW130302 | 0.2 | 1 | 2.4 | ● |
| | | Q-TPMW130304 | 0.4 | 1 | 2.3 | ● |
| | | Q-TPMW16T304 | 0.4 | 1 | 2.3 | ● |
| | | Q-TPMW160404 | 0.4 | 1 | 2.3 | ● |
| | | Q-TPMW160408 | 0.8 | 1 | 1.9 | ● |
| General purpose |  | Q-TPGN110304 | 0.4 | 1 | 2.2 | ● |
| | | Q-TPGN110308 | 0.8 | 1 | 2.2 | ● |
| | | Q-TPGN160304 | 0.4 | 1 | 2.3 | ● |
| | | Q-TPGN160308 | 0.8 | 1 | 1.9 | ● |

Note: Packing Qty : 2 pcs.

## Positive insert · Mini

| | |
|---|---|
| P | Steel |
| M | Stainless |
| K | Cast iron |
| N | Non-ferrous |
| S | Superalloys |
| H | Hard materials |
| | Sintered metal |

| Specification | Shape | Designation | Corner radius | No. of corner | CBN Length | BX310 | BX470 |
|---|---|---|---|---|---|---|---|
| | | | | | | ● | ●◐ |
| General purpose |  | 1QP-CCGW03X102 | 0.2 | 1 | 1.4 | ● | ● |
| | | 1QP-CCGW03X104 | 0.4 | 1 | 1.3 | ● | ● |
| | | 1QP-CCGW04T102 | 0.2 | 1 | 1.9 | ● | ● |
| | | 1QP-CCGW04T104 | 0.4 | 1 | 1.8 | ● | ● |
| General purpose |  | 1QP-EPGW03X102 | 0.2 | 1 | 1.4 | ● | ● |
| | | 1QP-EPGW03X104 | 0.4 | 1 | 1.3 | ● | ● |
| | | 1QP-EPGW040102 | 0.2 | 1 | 1.7 | ● | ● |
| | | 1QP-EPGW040104 | 0.4 | 1 | 1.6 | ● | ● |

● : Line-up

External toolholders → B217 -
Internal toolholders → B278 -
J series toolholders → B328 -
PINZBOHR® → F136 - F151
Cartridges → F152 -
Boring bar tools → F169 - F172
Top-borer tools → F173 -

# TurnLine - CBN Insert

## Positive insert · One-corner type

| | |
|---|---|
| P | Steel |
| M | Stainless |
| K | Cast iron |
| N | Non-ferrous |
| S | Superalloys |
| H | Hard materials |

| Specification | Shape | Designation | Corner radius | No. of corner | CBN Length | BX360 |
|---|---|---|---|---|---|---|
| General purpose |  | SPGN090304-QBN | 0.4 | 1 | 4.1 | ● |
| | | SPGN090308-QBN | 0.8 | 1 | 4.1 | ● |
| | | SPGN090312-QBN | 1.2 | 1 | 4.1 | ● |
| | | SPGN120308-QBN | 0.8 | 1 | 4.1 | ● |
| | | SPGN120312-QBN | 1.2 | 1 | 4.1 | ● |
| General purpose |  | TPGW090202-QBN | 0.2 | 1 | 3.3 | ● |
| | | TPGW090204-QBN | 0.4 | 1 | 3.2 | ● |
| | | TPGW110202-QBN | 0.2 | 1 | 3.9 | ● |
| | | TPGW110204-QBN | 0.4 | 1 | 3.7 | ● |
| | | TPGW130302-QBN | 0.2 | 1 | 3.9 | ● |
| | | TPGW130304-QBN | 0.4 | 1 | 3.7 | ● |
| | | TPGW16T302-QBN | 0.2 | 1 | 4.4 | ● |
| | | TPGW16T304-QBN | 0.4 | 1 | 4.2 | ● |
| | | TPGW16T308-QBN | 0.8 | 1 | 4.0 | ● |
| General purpose |  | TPGN110304-QBN | 0.4 | 1 | 3.7 | ● |
| | | TPGN110308-QBN | 0.8 | 1 | 3.5 | ● |
| | | TPGN160304-QBN | 0.4 | 1 | 4.2 | ● |
| | | TPGN160308-QBN | 0.8 | 1 | 4.0 | ● |
| General purpose |  | CPGA090204-QBN | 0.4 | 1 | 4.0 | ● |
| | | CPGA090208-QBN | 0.8 | 1 | 3.8 | ● |
| General purpose |  | TPGA090202-QBN | 0.2 | 1 | 3.1 | ● |
| | | TPGA090204-QBN | 0.4 | 1 | 2.9 | ● |
| | | TPGA110202-QBN | 0.2 | 1 | 3.9 | ● |
| | | TPGA110204-QBN | 0.4 | 1 | 3.7 | ● |
| | | TPGA110302-QBN | 0.2 | 1 | 3.9 | ● |
| | | TPGA110304-QBN | 0.4 | 1 | 3.7 | ● |
| | | TPGA160302-QBN | 0.2 | 1 | 4.4 | ● |
| | | TPGA160304-QBN | 0.4 | 1 | 4.2 | ● |
| | | TPGA160308-QBN | 0.8 | 1 | 4.0 | ● |

## Positive insert · Full-face type

| | |
|---|---|
| P | Steel |
| M | Stainless |
| K | Cast iron |
| N | Non-ferrous |
| S | Superalloys |
| H | Hard materials |

| Specification | Shape | Designation | Corner radius | No. of corner | CBN Length | BX360 |
|---|---|---|---|---|---|---|
| General purpose |  | TBGN060104-15-QBN | 0.4 | 3 | - | ● |
| | | TBGN060108-15-QBN | 0.8 | 3 | - | ● |

● : Line-up

External toolholders → B242 - Internal toolholders → B282 -
Cartridges → F152 - Boring bar tools → F169 - F172

# TurnLine - CBN Insert

## Coated Solid CBN (BXC90)

● : Continuous cutting
◐ : Light interrupted cutting
✣ : Heavy interrupted cutting

| | | |
|---|---|---|
| P | Steel | |
| M | Stainless | |
| K | Cast iron | ●◐ |
| N | Non-ferrous | |
| S | Superalloys | |
| H | Hard materials | |

| Specification | Shape | Designation | Corner radius | No. of corner | BXC90 |
|---|---|---|---|---|---|
| General purpose |  | **S-CNGN090308** | 0.8 | 4 | ● |
| | | **S-CNGN090312** | 1.2 | 4 | ● |
| | | **S-CNGN120408** | 0.8 | 4 | ● |
| | | **S-CNGN120412** | 1.2 | 4 | ● |
| General purpose |  | **S-RNGN090300** | - | - | ● |
| | | **S-RNGN120400** | - | - | ● |
| General purpose |  | **S-SNGN090308** | 0.8 | 8 | ● |
| | | **S-SNGN090312** | 1.2 | 8 | ● |
| | | **S-SNGN120308** | 0.8 | 8 | ● |
| | | **S-SNGN120312** | 1.2 | 8 | ● |
| | | **S-SNGN120408** | 0.8 | 8 | ● |
| | | **S-SNGN120412** | 1.2 | 8 | ● |
| General purpose |  | **S-TNGN110308** | 0.8 | 6 | ● |
| | | **S-TNGN110312** | 1.2 | 6 | ● |
| | | **S-TNGN160408** | 0.8 | 6 | ● |
| | | **S-TNGN160412** | 1.2 | 6 | ● |

● : Line-up

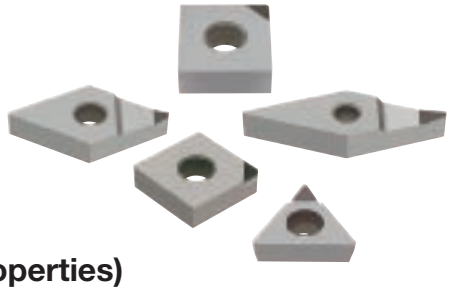
# TurnLine - CBN Insert

## T-CBN (PCBN tipped) grooving Insert



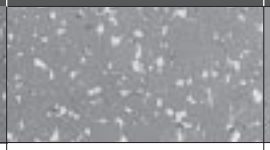
| | | |

Expanded product line allows T-DIA tools to be applied to wider workpiece materials and cutting conditions.





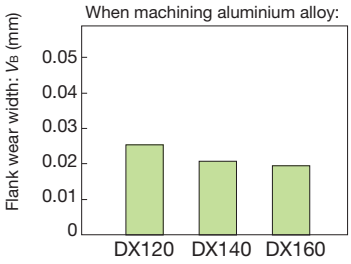
## Features and applications (Physical and mechanical properties)

| | DX110 | DX120 | DX140 | DX160 | DX180 |
|---|---|---|---|---|---|
| Grade |  |  |  |  |  |
| Property | Super fine grained grade. Excels in surface finish. | Fine grained grade. Excels in surface finish. | General purpose grade | High purity grade for hard materials | Highly wear resistant grade for special applications |
| Approx. grain size of diamond (μm) | < 1 | 5 | 13 | 28 | 45 |
| Hardness (Hv) | 8500 → | | | | 12000 (Harder) |
| Wear resistance | → | | | | Higher |
| Grindability (Cutting edge sharpness) | Better ← | | | | |

Note: T-DIA grades are not suitable for ferrous materials (such as hardened steel, chilled Cast iron), and Ni- or Co-base Superalloys.

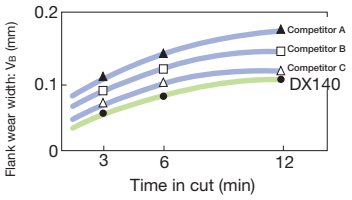
## Cutting performance (Wear resistance)

When machining aluminium alloy:




**Continuous external turning**
- Workpiece material: 10 % Si, aluminium alloy
- Insert: SPGN120308-DIA
- Toolholder: CSBPR2525M4
- Cutting speed: $v_c$ = 500 m/min
- Feed: $f$ = 0.1 mm/rev
- Depth of cut: $a_p$ = 0.5 mm
- Coolant: Dry cutting
- Time in cut: 30 min

When machining FRP:




**Face milling**
- Workpiece material: Fiber reinforced plastics (FRP)
- Insert: SPCN42ZFR-DIA
- Milling cutter: TPG4208R-A
- Cutting speed: $v_c$ = 942 m/min
- Feed: $f$ = 0.1 mm/rev
- Depth of cut: $a_p$ = 1.5 mm
- Coolant: Dry cutting

## Grade selection guide

**DX140** Basic selection (General purpose grade)

- For precision machining
- When good surface finish is required.
- When interrupted cutting is involved.

→ **DX120** Excels in cutting-edge sharpness and impact resistance. → **DX110** Super fine grained grade

- When machining hard materials such as high silicon aluminium alloys (Si > 12 %)
- Simultaneous machining of aluminium alloy and Cast iron.
- When high wear resistance is required.

→ **DX160** Superior wear resistance → **DX180** Special purpose grade

- When requiring higher wear resistance than DX160 (such as when machining high silicon materials, cemented carbides, semi-sintered ceramics, etc.)

## STANDARD CUTTING CONDITIONS FOR TURNING

| ISO | Workpiece material | Grade applicability DX110 | DX120 | DX140 | DX160 | DX180 | Cutting speed $v_c$ (m/min) | Depth of cut $a_p$ (mm) | Feed $f$ (mm/rev) |
|---|---|---|---|---|---|---|---|---|---|
| N | Aluminium alloys (Si < 12 %) | ○ | ○ | ◎ | | | 1000 - 2500 | 0.05 - 2.0 | 0.05 - 0.2 |
| | Aluminium alloys (Si > 12 %) | | | ○ | ◎ | | 400 - 800 | 0.05 - 2.0 | 0.05 - 0.2 |
| | Copper, brass | ○ | ○ | ◎ | | | 500 - 1500 | 0.05 - 2.0 | 0.05 - 0.2 |
| | Phosphor bronze | ○ | ○ | ◎ | | | 300 - 500 | 0.05 - 2.0 | 0.05 - 0.2 |
| | Carbon, graphite | | | ◎ | | | 300 - 500 | 0.05 - 2.0 | 0.05 - 0.2 |
| | FRP | ○ | ◎ | ○ | | | 500 - 1000 | 0.05 - 0.5 | 0.03 - 0.1 |
| | Plastics | ○ | ◎ | ○ | | | 500 - 1000 | 0.05 - 0.5 | 0.01 - 0.05 |
| | Cemented carbides (D40 ~ D60) | | | | ○ | ◎ | 10 - 20 | 0.05 - 0.2 | 0.01 - 0.05 |
| | Semi-sintered ceramics | | | | ○ | ◎ | 100 - 150 | 0.05 - 2.0 | 0.03 - 0.1 |

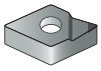
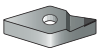
(Note) ◎ : First choice ○ : Second choice

# TurnLine - PCD Insert

## Negative insert (with rake angle)



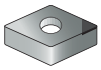
| | |
|---|---|
| P | Steel |
| M | Stainless |
| K | Cast iron |
| N | Non-ferrous |
| S | Superalloys |
| H | Hard materials |

| Specification | Shape | Designation | Corner radius | No. of corner | PCB Length | DX120 |
|---|---|---|---|---|---|---|
| Low cutting force |  | **CNMM120402-DIA** | 0.2 | 1 | 3.5 | ● |
| | | **CNMM120404-DIA** | 0.4 | 1 | 3.5 | ● |
| Low cutting force |  | **DNMM150402-DIA** | 0.2 | 1 | 3.3 | ● |
| | | **DNMM150404-DIA** | 0.4 | 1 | 3.1 | ● |
| Low cutting force |  | **TNMM160402-DIA** | 0.2 | 1 | 3.3 | ● |
| | | **TNMM160404-DIA** | 0.4 | 1 | 3.2 | ● |
| Low cutting force |  | **VNMM160402-DIA** | 0.2 | 1 | 4.8 | ● |
| | | **VNMM160404-DIA** | 0.4 | 1 | 4.4 | ● |
| | | **VNMM160408-DIA** | 0.8 | 1 | 3.6 | ● |

## Negative insert



| | |
|---|---|
| P | Steel |
| M | Stainless |
| K | Cast iron |
| N | Non-ferrous |
| S | Superalloys |
| H | Hard materials |

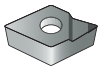
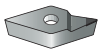
| Specification | Shape | Designation | Corner radius | No. of corner | PCB Length | DX140 | DX160 |
|---|---|---|---|---|---|---|---|
| General purpose |  | **CNGA120404-DIA** | 0.4 | 1 | 3.5 | ● | |
| General purpose |  | **DNGA150404-DIA** | 0.4 | 1 | 3.1 | ● | ● |
| | | **DNGA150408-DIA** | 0.8 | 1 | 2.8 | ● | |
| General purpose |  | **TNGA160404-DIA** | 0.4 | 1 | 3.2 | ● | ● |
| | | **TNGA160408-DIA** | 0.8 | 1 | 2.9 | ● | ● |
| General purpose |  | **SNGA120404-DIA** | 0.4 | 1 | 3.6 | ● | |
| | | **SNGA120408-DIA** | 0.8 | 1 | 3.6 | ● | |
| General purpose |  | **SNGN120408-DIA** | 0.8 | 1 | 3.6 | ● | |

● : Line-up

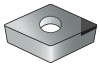
External toolholders → B206 -
J series toolholders → B342 - B344
PINZBOHR® → F136 - F151
Internal toolholders → B292 -
TungCap → B215, F046 -
Cartridges → F152 -

# TurnLine - PCD Insert

## Positive insert (with rake angle)

| | | | | | | | DX120 |
|---|---|---|---|---|---|---|---|
| | | | | | | P Steel | |
| | | | | | | M Stainless | |
| | | | | | | K Cast iron | |
| | | | | | | N Non-ferrous | ●◐ |
| | | | | | | S Superalloys | |
| | | | | | | H Hard materials | |
| Specification | Shape | Designation | Corner radius | No. of corner | Relief angle | PCB Length | |
| Low cutting force |  | CCMT060202-DIA | 0.2 | 1 | 7° | 2.4 | ● |
| | | CCMT060204-DIA | 0.4 | 1 | 7° | 2.4 | ● |
| | | CCMT09T302-DIA | 0.2 | 1 | 7° | 3.5 | ● |
| | | CCMT09T304-DIA | 0.4 | 1 | 7° | 3.5 | ● |
| Low cutting force |  | DCMT070202-DIA | 0.2 | 1 | 7° | 2.3 | ● |
| | | DCMT070204-DIA | 0.4 | 1 | 7° | 2.1 | ● |
| | | DCMT11T302-DIA | 0.2 | 1 | 7° | 3.2 | ● |
| | | DCMT11T304-DIA | 0.4 | 1 | 7° | 3.0 | ● |
| Low cutting force |  | TCMT080202-DIA | 0.2 | 1 | 7° | 2.4 | ● |
| | | TCMT080204-DIA | 0.4 | 1 | 7° | 2.3 | ● |
| | | TCMT110202-DIA | 0.2 | 1 | 7° | 2.4 | ● |
| | | TCMT110204-DIA | 0.4 | 1 | 7° | 2.2 | ● |
| | | TCMT110302-DIA | 0.2 | 1 | 7° | 2.4 | ● |
| | | TCMT110304-DIA | 0.4 | 1 | 7° | 2.2 | ● |
| Low cutting force |  | VCMT160402-DIA | 0.2 | 1 | 7° | 4.8 | ● |
| | | VCMT160404-DIA | 0.4 | 1 | 7° | 4.4 | ● |

## Positive insert

| | | | | | | | DX120 | DX140 | DX160 |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | P Steel | | | |
| | | | | | | M Stainless | | | |
| | | | | | | K Cast iron | | | |
| | | | | | | N Non-ferrous | ●◐ | ●◐ | ●◐ |
| | | | | | | S Superalloys | | | |
| | | | | | | H Hard materials | | | |
| Specification | Shape | Designation | Corner radius | No. of corner | Relief angle | PCB Length | | | |
| General purpose |  | CCGW060200-DIA | 0.05 | 1 | 7° | 2.4 | | ● | |
| | | CCGW060202-DIA | 0.2 | 1 | 7° | 2.4 | | ● | |
| | | CCGW060204-DIA | 0.4 | 1 | 7° | 2.4 | | ● | |
| | | CCGW09T302-DIA | 0.2 | 1 | 7° | 3.5 | | ● | |
| | | CCGW09T304-DIA | 0.4 | 1 | 7° | 3.5 | | ● | ● |
| | | CCGW09T308-DIA | 0.8 | 1 | 7° | 3.4 | | ● | |
| General purpose |  | DCGW070200-DIA | 0.05 | 1 | 7° | 2.4 | | ● | |
| | | DCGW070202-DIA | 0.2 | 1 | 7° | 2.3 | ● | ● | |
| | | DCGW070204-DIA | 0.4 | 1 | 7° | 2.1 | | ● | |
| | | DCGW11T302-DIA | 0.2 | 1 | 7° | 3.2 | | ● | |
| | | DCGW11T304-DIA | 0.4 | 1 | 7° | 3.0 | | ● | |
| | | DCGW11T308-DIA | 0.8 | 1 | 7° | 2.7 | | ● | |
| General purpose |  | SPGN090308-DIA | 0.8 | 1 | 11° | 3.6 | | ● | |
| | | SPGN120302-DIA | 0.2 | 1 | 11° | 3.6 | | ● | |
| | | SPGN120304-DIA | 0.4 | 1 | 11° | 3.6 | | ● | |
| | | SPGN120308-DIA | 0.8 | 1 | 11° | 3.6 | | ● | ● |

● : Line-up

External toolholders → B217 -
J series toolholders → B328 -
PINZBOHR® → F136 - F151
Internal toolholders → B278 -
TungCap → F046 -
Cartridges → F152 -

# TurnLine - PCD Insert

● : Continuous cutting
ɔ : Light interrupted cutting
✣ : Heavy interrupted cutting

## Positive insert

| | |
|---|---|
| P | Steel |
| M | Stainless |
| K | Cast iron |
| N | Non-ferrous |
| S | Superalloys |
| H | Hard materials |

| Specification | Shape | Designation | Corner radius | No. of corner | Relief angle | PCB Length | DX120 | DX140 |
|---|---|---|---|---|---|---|---|---|
| General purpose |  | TPGW080202-DIA | 0.2 | 1 | 11° | 2.4 | | ● |
| | | TPGW080204-DIA | 0.4 | 1 | 11° | 2.3 | | ● |
| | | TPGW090202-DIA | 0.2 | 1 | 11° | 2.4 | ● | ● |
| | | TPGW090204-DIA | 0.4 | 1 | 11° | 2.2 | | ● |
| | | TPGW110202-DIA | 0.2 | 1 | 11° | 2.4 | ● | ● |
| | | TPGW110204-DIA | 0.4 | 1 | 11° | 2.2 | | ● |
| | | TPGW130302-DIA | 0.2 | 1 | 11° | 3.3 | ● | ● |
| | | TPGW130304-DIA | 0.4 | 1 | 11° | 3.2 | | ● |
| | | TPGW16T302-DIA | 0.2 | 1 | 11° | 3.3 | | ● |
| | | TPGW16T304-DIA | 0.4 | 1 | 11° | 3.2 | | ● |
| | | TPGW16T308-DIA | 0.8 | 1 | 11° | 2.9 | | ● |
| General purpose |  | TPGN090204-DIA | 0.4 | 1 | 11° | 2.2 | | ● |
| | | TPGN110304-DIA | 0.4 | 1 | 11° | 3.2 | ● | ● |
| | | TPGN110308-DIA | 0.8 | 1 | 11° | 2.9 | | ● |
| | | TPGN160302-DIA | 0.2 | 1 | 11° | 3.3 | | ● |
| | | TPGN160304-DIA | 0.4 | 1 | 11° | 3.2 | ● | ● |
| | | TPGN160308-DIA | 0.8 | 1 | 11° | 2.9 | | ● |
| General purpose |  | VCGW160402-DIA | 0.2 | 1 | 7° | 4.8 | | ● |
| | | VCGW160404-DIA | 0.4 | 1 | 7° | 4.4 | | ● |
| General purpose |  | EPGW040102-DIA | 0.2 | 1 | 11° | 2.0 | | ● |
| | | EPGW040104-DIA | 0.4 | 1 | 11° | 1.9 | | ● |
| General purpose |  | CPGA090202-DIA | 0.2 | 1 | 11° | 3.5 | | ● |
| | | CPGA090204-DIA | 0.4 | 1 | 11° | 3.5 | | ● |
| General purpose |  | TPGA090202-DIA | 0.2 | 1 | 11° | 2.4 | | ● |
| | | TPGA090204-DIA | 0.4 | 1 | 11° | 2.2 | | ● |
| | | TPGA110202-DIA | 0.2 | 1 | 11° | 2.4 | | ● |
| | | TPGA110204-DIA | 0.4 | 1 | 11° | 2.2 | | ● |
| | | TPGA110302-DIA | 0.2 | 1 | 11° | 2.4 | | ● |
| | | TPGA110304-DIA | 0.4 | 1 | 11° | 2.2 | | ● |
| | | TPGA110308-DIA | 0.8 | 1 | 11° | 2.9 | | ● |
| | | TPGA160302-DIA | 0.2 | 1 | 11° | 3.3 | | ● |
| | | TPGA160304-DIA | 0.4 | 1 | 11° | 3.2 | | ● |
| | | TPGA160308-DIA | 0.8 | 1 | 11° | 2.9 | | ● |

● : Line-up

External toolholders → B242 - Internal toolholders → B279 -
Cartridges → F152 - Boring bar tools → F169 - F172

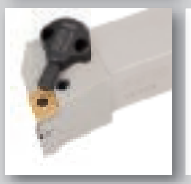
MEMO

# TurnLine - External Toolholder



## MINIFORCE TURN
Economical double-sided inserts with excellent sharpness

B188



## ISOECO TURN
Small-sized “Eco” insert series for maximized profits

B200



## TURNINGA
Highly rigid clamping system with excellent repeatability

B206



## TUNGTJET TURN
Toolholders for high pressure coolant supply

B214



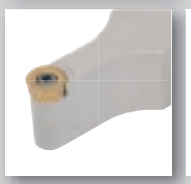
## Y-PRO SERIES
Inserts with 25° corner angle for profiling

B219



## ISO-Turn External
Toolholders for general external turning
D-type, H-type, M-type, P-type, S-type, T-type

B220



## FIXRTURN
Highly productive round insert with 6 indexes

B252



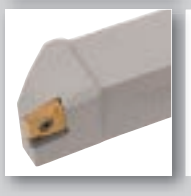
## DIMPLEFX
Ceramic insert with dimple for highly efficient cast iron machining

B254



## TURNFEED
Tool series for high-feed cutting

B257



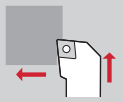
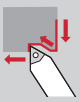
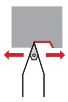
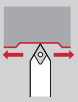
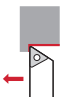
## TURNTEC
Inserts and toolholders for roughing large depths of cut with high productivity

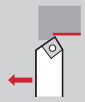
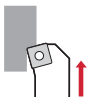
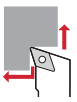
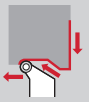
B258



# External Toolholder - Quick Guide



| | Turning Facing | External profiling | | | | Turning | | |
|---|---|---|---|---|---|---|---|---|
| | **L 95°**  | **J 93°**  | **N 63°**  | **V 72.5°**  | **P 62.5°**  | **A 91°**  | **G 91°**  | **B·R 75°**  |
| **Turning A** Double clamping | **80°** CN□□<br>ACLNR/L<br>□0904-A □12-A<br>□16-A □19-A<br>**B200, B206**<br>**80°** WN□□<br>AWLNR/L<br>□06-A □08-A<br>**B200, B206** | **55°** DN□□<br>ADJNR/L<br>□1104-A □15-A<br>□1506-A<br>**B201, B207**<br>**35°** VN□□<br>AVJNR/L<br>□16-A<br>**B207**<br>**60°** TN□□<br>ATJNR/L<br>□16-A<br>**B208**<br>**25°** YNMG<br>AVJNR/L<br>□16-A<br>**B207** | | **35°** VN□□<br>AVVNN<br>□16-A<br>**B208**<br>**25°** YNMG<br>AVVNN<br>□16-A<br>**B208** | **55°** DN□□<br>ADPNN<br>□15-A<br>**B208** | | **60°** TN□□<br>ATGNR/L<br>□16-A □22-A<br>**B209** | **90°** SN□□<br>ASBNR/L<br>□12-A □15-A<br>□19-A<br>**B209** |
| **D** One-Double | **80°** CN□□<br>DCLNR/L<br>□12 □16 □19<br>**B220**<br>**80°** WN□□<br>DWLNR/L<br>□06 □08<br>**B221** | **55°** DN□□<br>DDJNR/L<br>□15 □1506<br>**B221** | | | | | **60°** TN□□<br>DTGNR/L<br>□16 □22<br>**B222** | **90°** SN□□<br>DSBNR/L<br>□12 □15 □19<br>**B222** |
| **C** Double clamping for dimple ceramic insert | **80°** CN□□<br>CCLNR/L<br>□1207-RD<br>**B254** | **55°** DN□□<br>CDJNR/L<br>□1507-RD<br>**B254** | **55°** DNGD<br>CDNNN<br>□1507-RD<br>**B255** | **35°** VNGD<br>CVVNN<br>□1607-RD<br>**B255** | | | | |
| **P** Lever lock | **80°** CN□□<br>PCLNR/L<br>□0904 □09 □12<br>□16 □19<br>**B200, B201** TungTurn-Jet, **B214** TungTurn-Jet, **B225**<br>**80°** WN□□<br>PWLNR/L<br>□0604<br>**B201** | **55°** DN□□<br>PDJNR/L<br>□11 □1104 □15<br>□1506<br>**B202** TungTurn-Jet, **B214** TungTurn-Jet, **B226**<br>**60°** TN□□<br>PTJNR/L<br>□1104<br>**B203** | | | **55°** DN□□<br>PDPNN<br>□15 □1506<br>**B227** | | **60°** TN□□<br>PTGNR/L<br>□1104 □16 □22<br>**B203, B227** | **90°** SN□□<br>PSBNR/L<br>□09 □12 □19<br>**B228**<br>**100°** CN□□<br>PCBNR/L<br>□12<br>**B228** |
| **M** Multi clamping | **80°** CN□□<br>MCLNR/L<br>□12<br>**B233**<br>**80°** CN□□<br>MCLNR/L<br>□12<br>**B233**<br>**80°** WN□□<br>MWLNR/L<br>□08<br>**B233** | **35°** VN□□<br>MVJNR/L<br>□16<br>**B233**<br>**25°** YNMG<br>MVJNR/L<br>□16<br>**B233**<br>**60°** TN□□<br>MTJNR/L<br>□16 □22<br>**B234**<br>**55°** DN□□<br>MDJNR/L<br>□15<br>**B234**<br>**55°** DN□□<br>MDJNR/L<br>□15<br>**B234**<br>**60°** TN□□<br>MTJNR/L<br>□16<br>**B234** | | **35°** VN□□<br>MVVNN<br>□16<br>**B234**<br>**25°** YNMG<br>MVVNN<br>□16<br>**B234** | **55°** DN□□<br>MDPNN<br>□15<br>**B235**<br>**55°** DN□□<br>MDPNN<br>□15<br>**B235** | | | |
| **C** Clamp-on | | **55°** KNMX<br>CKJNR/L<br>□16<br>**B240** | | | | | **60°** TN□□<br>CTGNR/L<br>□16<br>**B240** | **90°** SN□□<br>CSBNR/L<br>□12<br>**B240** |
| **H** Retract-pin | | | | | | | | **90°** SNMM<br>HSRNR/L<br>□31<br>**B244** |
| **JT** Back clamping | | | | | | **60°** TN□□<br>JTTANR/L<br>□16<br>**B343** | | |

| Turning chamfering | | Turning/Facing chamfering | Facing | | | Profiling | | External profiling |
|---|---|---|---|---|---|---|---|---|
| **E 60°**  | **D 45°**  | **S 45°**  | **K 75°**  | **F 91°**  | **C 90°**  | **X 100°**  | **Q*1 · H*1 45°**  | **Special**  |
| | **90°** SN□□<br>ASDNN<br>□12-A<br>**B210** | **90°** SN□□<br>ASSNR/L<br>□12-A □15-A<br>□19-A<br>**B210** | **90°** SN□□<br>ASKNR/L<br>□12-A<br>**B211** | **60°** TN□□<br>ATFNR/L<br>□16-A □22-A<br>**B211** | | | **55°** DN□□<br>ADQNR/L<br>□1104-A □15-A<br>□1506-A<br>**B204, B212**<br>**35°** VN□□<br>AVQNR/L<br>□16-A<br>**B213**<br>**60°** TN□□<br>ATQNR/L<br>□16-A<br>**B212**<br>**25°** YNMG<br>AVQNR/L<br>□16-A<br>**B213** | - RN□□<br>ARGNR/L<br>□12-A<br>**B213** |
| | **90°** SN□□<br>DSDNN<br>□12<br>**B222** | **90°** SN□□<br>DSSNR/L<br>□12<br>**B223** | **90°** SN□□<br>DSKNR/L<br>□12<br>**B223** | **60°** TN□□<br>DTFNR/L<br>□16 □22<br>**B223** | | | **55°** DN□□<br>DDQNR/L<br>□15 □1506<br>**B224** | - RN□□<br>DRGNR/L<br>□12-A<br>**B224** |
| | | **90°** SNGD<br>CSSNR/L<br>□1207-RD<br>**B255**<br>**90°** HNGD<br>CHSNR/L<br>□0507-RD<br>**B256** | | | | | | |
| | **90°** SN□□<br>PSDNN<br>□09 □12<br>**B229** | **90°** SN□□<br>PSSNR/L<br>□09 □12 □19<br>**B229** | **90°** SN□□<br>PSKNR/L<br>□09 □12 □19<br>**B230** | **60°** TN□□<br>PTFNR/L<br>□1104 □16 □22<br>**B204, B230**<br>**80°** CN□□<br>PCFNR/L<br>□12<br>**B231** | | | **55°** DN□□<br>PDQNR/L<br>□15<br>**B231** | - RNMG<br>PRGNR/L<br>□09 □12<br>**B231** |
| **60°** TN□□<br>MTENN<br>□16<br>**B235** | | | | | | | **35°** VN□□<br>MVQNR/L<br>□16<br>**B236**<br>**25°** YNMG<br>MVQNR/L<br>□16<br>**B236**<br>**60°** TN□□<br>MTQNR/L<br>□16<br>**B235** | |
| | **90°** SN□□<br>CSDNN<br>□12<br>**B241** | **90°** SN□□<br>CSSNR/L<br>□12<br>**B241, B255** | **90°** SN□□<br>CSKNR/L<br>□12<br>**B241** | **60°** TN□□<br>CTFNR/L<br>□16<br>**B242** | | | | |

Note:*1 marked Q and H style are Tungaloy Standard.

# External Toolholder - Quick Guide



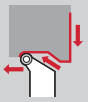
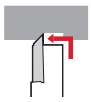
| | Turning Facing | External profiling | | | Turning | | | Turning Facing | |
|---|---|---|---|---|---|---|---|---|---|
| | **L 95°** | **J 93°** | | **V 72.5°** | **N 62.5°** | **A 91°** | **G 91°** | **B·R 75°** | **X 20°** | |
| **X** Double clamping screw-on/clamping | | | | | | | | | 80° WPMT<br>XWXPR/L<br>□09<br>**B257** | |
| **P** Lever lock | 80° WXGU<br>JPWL2XR/L<br>□04<br>**B188** | 55° DXGU<br>JPDJ2XR/L<br>□07<br>**B190** | 35° VXGU<br>JPVJ2XR/L<br>□09<br>**B192** | | | | | | | |
| **C** Clamp-on | | | | | | | 60° TP□□<br>CTGPR/L<br>□16<br>**B242** | 90° SP□□<br>CSBPR/L<br>□09 □12<br>**B242** | | |
| **J** Screw-on | 80° CC□□<br>JSCLCR/L<br>□06 □09<br>**B329**<br><br>80° CC□□<br>JSCL2CR/L*2<br>□06 □09<br>**B328**<br><br>35° VP□□<br>JSVL2PR/L<br>□08 □11<br>**B341**<br><br>80° WXGU<br>JSWLXR □04<br>**B189**<br>JSWL2XR/L □04<br>**B188, B189**<br>**B216** TungTurn-Jet | 55° DC□□<br>JSDJCR/L<br>□07 □11<br>**B332, B333**<br><br>55° DC□□<br>JSDJ2CR/L*2<br>□07 □11<br>**B217** TungTurn-Jet,<br>**B331, B333**<br><br>35° VB□□<br>JSVJBR/L<br>□11<br>**B337, B339**<br><br>35° VB□□<br>JSVJ2BR/L<br>□11<br>**B217** TungTurn-Jet,<br>**B337, B338** | 55° DXGU<br>JSDJXR □07<br>**B191**<br>JSDJ2XR/L □07<br>**B190, B191**<br>**B216** TungTurn-Jet<br><br>35° VXGU<br>JSVJXR □09<br>**B193**<br>JSVJ2XR/L □09<br>**B192, B193,**<br>**B216** TungTurn-Jet | 33° VB□□<br>JSVNBN<br>□11<br>**B340** | 55° DC□□<br>JSDNCN<br>□07 □11<br>**B334**<br><br>55° DC□□<br>JSDN3CR/L*3<br>□08 □11<br>**B334** | 80° CC□□<br>JSCACL<br>□06 □09<br>**B330**<br><br>60° TC□□<br>JSTACR/L<br>□08 □11<br>**B336**<br><br>35° VB□□<br>JSVABR/L<br>□11<br>**B338** | 80° CC□□<br>JSCGCR/L<br>□06 □09<br>**B331** | | | |
| **S** Screw-on | 80° CC□□<br>SCLCR/L<br>□06 □09 □12<br>**B245** | 55° DC□□<br>SDJCR/L<br>□11<br>**B245**<br><br>35° VC□□<br>SVJCR/L<br>□16<br>**B245**<br><br>25° YWMT<br>SYJBR/L<br>□16<br>**B219** | | 35° VC□□<br>SVVCN<br>□16<br>**B246** | 55° DC□□<br>SDNCN<br>□11<br>**B246** | 60° TC□□<br>STACR/L<br>□16<br>**B246** | | | | |
| **JT** Back clamping | 80° CC□□<br>JTCL2CR/L<br>□06 □09<br>**B328** | 55° DC□□<br>JTDJ2CR/L<br>□07 □11<br>**B332** | | | | 60° TC□□<br>JTTACR/L<br>□08 □11<br>**B336** | | | | |
| **T** Taper-lock | | | | | | | | | | |

*2: L2 and J2: without offset *3 63°

| Turning Chamfering | Turning / Facing Chamfering | Facing | | Profiling | | | |
|---|---|---|---|---|---|---|---|
| D 45° | S 45° | F 91° | C 90° | Q*1 45° · H*1 17.5° | H 100° | I 76.5° | P 117.5° |
| | | | | | | | |
| | | | | | | | |
| 90° □ SP□□<br>CSDPN<br>□09 □12<br>B243 | 90° □ SP□□<br>CSSPR/L<br>□09 □12<br>B243 | 60° △ TP□□<br>CTFPR/L<br>□16<br>B243 | 60° △ TP□□<br>CTCPR/L<br>□16<br>B244 | | | | |
| | | 55° ◇ DC□□<br>JSDFCR/L<br>□07 □11<br>B335 | | | | | 35° ◇ VP□□<br>JSVP2PR/L<br>□08 □11<br>B341 |
| 90° ○ SC□□<br>SSDCN<br>□07 □09<br>B249<br><br>90° ○ SP□□<br>SSDPN Tungaloy standard<br>□07 □09<br>B249 | | | | 35° ◇ VC□□<br>SVQCR/L<br>□16<br>B250<br><br>55° ◇ DC□□<br>SDQCR/L<br>□11<br>B250<br><br>35° ◇ VCG□<br>SVHCR/L<br>□22<br>B250<br><br>25° ◇ YWMT<br>SYQBR/L<br>□16<br>B219 | 25° ◇ YWMT<br>SYHBR/L<br>□16<br>B220 | 25° ◇ YWMT<br>SYIBN<br>□16<br>B220 | |
| | | | | | | | |
| | | | | | | | |

Note:*1 marked Q and H style are Tungaloy Standard.

# External Toolholder - Quick Guide

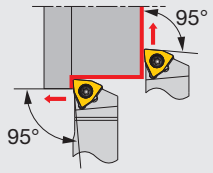
| | External profiling | Back turning | Front turning / Revese turning |
|---|---|---|---|
| | Special  |  |  |
| **X** Double clamping screw-on/clamping | | | |
| **P** Lever lock | - RCM□<br>PRGCR/L<br>□10 □12 □16 □20<br>**B232**<br>- RCM□<br>PRDCN<br>□10 □12 □16 □20 □25<br>**B232** | | |
| **C** Clamp-on | | | |
| **J** Screw-on | | JXB<br>JSXBR/L<br>□08<br>**B346**<br>JTB<br>JSTBR/L<br>□03<br>**B347**<br>JS□□K-TBL3<br>□3<br>**B347**<br>J10E<br>JSEGR/L<br>□10<br>**B349** | JX□□<br>JSXGR/L<br>□08<br>**B362** |
| **S** Screw-on | - RCMT<br>SRACR/L<br>□05 □06 □08<br>**B247**<br>- RCMT<br>SRGCR/L<br>□05 □06 □08 □10 □12<br>**B248, B252** FixRTurn<br>- RCMT<br>SRDCN<br>□06 □08 □10<br>**B249, B252** FixRTurn | **Note:** JSXBR/L type is also used for JXT-type threading inserts. | **Note:** JSXGR/L type is also used for JXG-type grooving inserts. |
| **JT** Back clamping | | | |
| **T** Taper-lock | - RT□□<br>TRACN<br>□05 □06 □08<br>**B251**<br>- RT□□<br>TRDCN<br>□05 □06 □08<br>**B251** | | |

MEMO

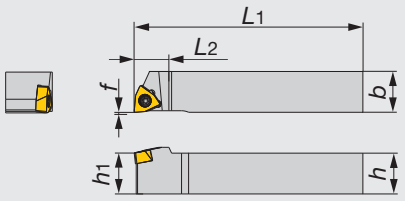
MINIFORCE TURN

## JSWL2XR/L

Screw-on toolholder without offset with 95° approaach angle, for WXGU inserts




Cutting edge style **L2**




Without offset

Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| JSWL2XR/L1010X04 | 10 | 10 | 120 | 11 | 10 | 0 | 0.2 | WXGU0403**L/R... | 0.9 |
| JSWL2XR/L1212F04 | 12 | 12 | 85 | 11 | 12 | 0 | 0.2 | WXGU0403**L/R... | 0.9 |
| JSWL2XR/L1212X04 | 12 | 12 | 120 | 11 | 12 | 0 | 0.2 | WXGU0403**L/R... | 0.9 |
| JSWL2XR/L1616X04 | 16 | 16 | 120 | 13 | 16 | 0 | 0.2 | WXGU0403**L/R... | 0.9 |
| JSWL2XR/L2020H04 | 20 | 20 | 100 | 13 | 20 | 0 | 0.2 | WXGU0403**L/R... | 0.9 |

*Torque: Recommended torque (N·m) for clamping **$r_\varepsilon$: Standard corner radius
Note: Right-hand toolholders (R) are used with left-hand inserts (L). Left-hand toolholders (L) are used with right-hand inserts (R).

**SPARE PARTS**

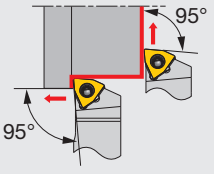



| Designation | Clamping screw | Wrench |
|---|---|---|
| JSWL2XR/L... | SR34-514 | T-7F |

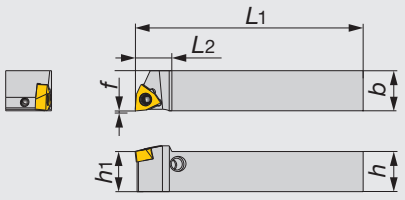
MINIFORCE TURN

## JPWL2XR/L

Side clamp toolholder without offset with 95° approach angle, for WXGU inserts




Cutting edge style **L2**




Without offset

Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| JPWL2XR/L1010X04 | 10 | 10 | 120 | 11 | 10 | 0 | 0.2 | WXGU0403**L/R... | 0.9 |
| JPWL2XR/L1212F04 | 12 | 12 | 85 | 11 | 12 | 0 | 0.2 | WXGU0403**L/R... | 0.9 |
| JPWL2XR/L1212X04 | 12 | 12 | 120 | 11 | 12 | 0 | 0.2 | WXGU0403**L/R... | 0.9 |
| JPWL2XR/L1616X04 | 16 | 16 | 120 | 13 | 16 | 0 | 0.2 | WXGU0403**L/R... | 0.9 |

*Torque: Recommended torque (N·m) for clamping **$r_\varepsilon$: Standard corner radius
Note: Right-hand toolholders (R) are used with left-hand inserts (L). Left-hand toolholders (L) are used with right-hand inserts (R).

**SPARE PARTS**



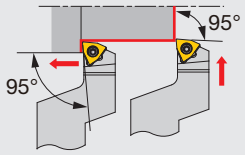



| Designation | Lever | Pin | Clamping screw | Wrench |
|---|---|---|---|---|
| JPWL2XR/L... | SLLV-2 | SL-PI-2 | SR10400611 | HW2.0/5RED |

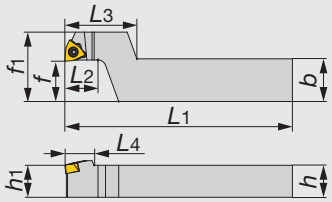
JSWL2XR/L, JPWL2XR/L: Inserts → **B195 -**, Standard cutting conditions → **B198**

## JSWLXR-F

Screw-on stepped-head toolholder with 95° approach angle, for WXGU inserts




Cutting edge style **L**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *L*3 | *L*4 | *h*1 | *f* | *f*1 | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JSWLXR1016X04-F15 | 10 | 16 | 120 | 12 | 27 | 11 | 10 | 15 | 26 | 0.2 | WXGU0403**L... | 0.9 |
| JSWLXR1216F04-F15 | 12 | 16 | 85 | 12 | 27 | 11 | 12 | 15 | 26 | 0.2 | WXGU0403**L... | 0.9 |
| JSWLXR1216X04-F15 | 12 | 16 | 120 | 12 | 27 | 11 | 12 | 15 | 26 | 0.2 | WXGU0403**L... | 0.9 |
| JSWLXR1620X04-F15 | 16 | 20 | 120 | 12 | 27 | 11 | 16 | 15 | 26 | 0.2 | WXGU0403**L... | 0.9 |

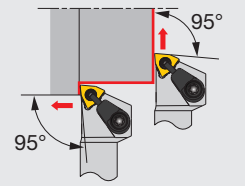
*Torque: Recommended torque (N·m) for clamping **$r_\varepsilon$: Standard corner radius
Note: Right-hand toolholders (R) are used with left-hand inserts (L).

**SPARE PARTS**

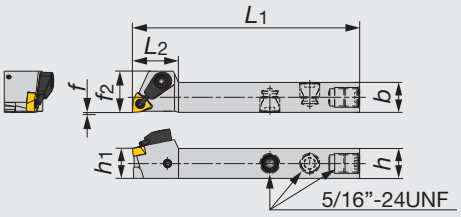
| Designation | Clamping screw | Wrench |
|---|---|---|
| JSWLXR**-F15 | SR34-514 | T-7F |

## JSWL2XR/L-CHP

Screw-on toolholder without offset with 95° approach angle, for WXGU inserts,with channels for high pressure coolant




Cutting edge style **L2**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *f*2 | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| JSWL2XR/L1212F04-CHP | 12 | 12 | 85 | 18 | 12 | 0 | 16.5 | 0.2 | WXGU0403**L/R... | 0.9 |

*Torque: Recommended torque (N·m) for clamping **$r_\varepsilon$: Standard corner radius
Note: Right-hand toolholders (R) are used with left-hand inserts (L). Left-hand toolholders (L) are used with right-hand inserts (R).

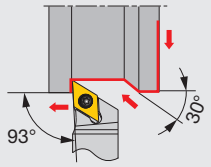
**SPARE PARTS**

| Designation | Clamping screw | Coolant unit | Wrench |
|---|---|---|---|
| JSWL2XR/L1212F04-CHP | SR34-514 | S-CU-CHP | T-7F |

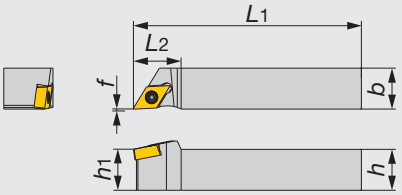
JSWLXR-F, JSWL2XR/L-CHP: Inserts → **B195**, Standard cutting conditions → **B198**

# MINIFORCE TURN
## JSDJ2XR/L

Screw-on toolholder without offset with 93° approach angle, for DXGU inserts




Cutting edge style **J2**




Without offset

Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| JSDJ2XR/L1010X07 | 10 | 10 | 120 | 14 | 10 | 0 | 0.2 | DXGU0703**L/R... | 0.9 |
| JSDJ2XR/L1212F07 | 12 | 12 | 85 | 14 | 12 | 0 | 0.2 | DXGU0703**L/R... | 0.9 |
| JSDJ2XR/L1212X07 | 12 | 12 | 120 | 14 | 12 | 0 | 0.2 | DXGU0703**L/R... | 0.9 |
| JSDJ2XR/L1616X07 | 16 | 16 | 120 | 18 | 16 | 0 | 0.2 | DXGU0703**L/R... | 0.9 |
| JSDJ2XR/L2020H07 | 20 | 20 | 100 | 18 | 20 | 0 | 0.2 | DXGU0703**L/R... | 0.9 |

*Torque: Recommended torque (N·m) for clamping **$r_\varepsilon$: Standard corner radius
Note: Right-hand toolholders (R) are used with left-hand inserts (L). Left-hand toolholders (L) are used with right-hand inserts (R).

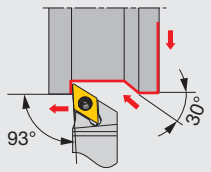
**SPARE PARTS**



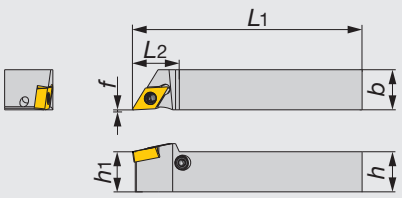

| Designation | Clamping screw | Wrench |
|---|---|---|
| JSDJ2XR/L... | SR34-514 | T-7F |

# MINIFORCE TURN
## JPDJ2XR/L

Side clamp toolholder without offset with 93° approach angle, for DXGU inserts




Cutting edge style **J2**




Without offset

Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| JPDJ2XR/L1010X07 | 10 | 10 | 120 | 14 | 10 | 0 | 0.2 | DXGU0703**L/R... | 0.9 |
| JPDJ2XR/L1212F07 | 12 | 12 | 85 | 14 | 12 | 0 | 0.2 | DXGU0703**L/R... | 0.9 |
| JPDJ2XR/L1212X07 | 12 | 12 | 120 | 14 | 12 | 0 | 0.2 | DXGU0703**L/R... | 0.9 |
| JPDJ2XR/L1616X07 | 16 | 16 | 120 | 18 | 16 | 0 | 0.2 | DXGU0703**L/R... | 0.9 |

*Torque: Recommended torque (N·m) for clamping **$r_\varepsilon$: Standard corner radius
Note: Right-hand toolholders (R) are used with left-hand inserts (L). Left-hand toolholders (L) are used with right-hand inserts (R).

**SPARE PARTS**



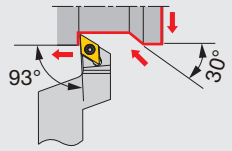



| Designation | Lever | Pin | Clamping screw | Wrench |
|---|---|---|---|---|
| JPDJ2XR/L... | SLLV-2 | SL-PI-2 | SR10400611 | HW2.0/5RED |

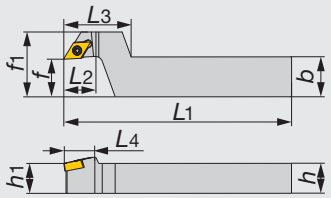
JSDJ2XR/L, JPDJ2XR/L: Inserts → **B196 -**, Standard cutting conditions → **B198**

## MINIFORCE TURN
## JSDJXR-F

Screw-on stepped-head toolholder with 93° approach angle, for DXGU inserts




Cutting edge style **J**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *L*3 | *L*4 | *h*1 | *f* | *f*1 | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JSDJXR1016X07-F15 | 10 | 16 | 120 | 12 | 27 | 14 | 10 | 15 | 26 | 0.2 | DXGU0703**L... | 0.9 |
| JSDJXR1216F07-F15 | 12 | 16 | 85 | 12 | 27 | 14 | 12 | 15 | 26 | 0.2 | DXGU0703**L... | 0.9 |
| JSDJXR1216X07-F15 | 12 | 16 | 120 | 12 | 27 | 14 | 12 | 15 | 26 | 0.2 | DXGU0703**L... | 0.9 |
| JSDJXR1620X07-F15 | 16 | 20 | 120 | 12 | 27 | 14 | 16 | 15 | 26 | 0.2 | DXGU0703**L... | 0.9 |

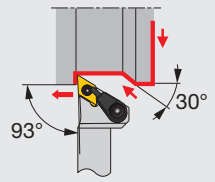
*Torque: Recommended torque (N·m) for clamping **$r_\varepsilon$: Standard corner radius
Note: Right-hand toolholders (R) are used with left-hand inserts (L).

**SPARE PARTS**

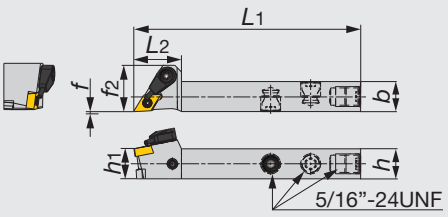
| Designation | Clamping screw | Wrench |
|---|---|---|
| JSDJXR**-F15 | SR34-514 | T-7F |

## MINIFORCE TURN
## JSDJ2XR/L-CHP

Screw-on toolholder without offset with 93° approach angle, for DXGU inserts, with channels for high pressure coolant




Cutting edge style **J2**




Without offset

Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *f*2 | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| JSDJ2XR/L1212F07-CHP | 12 | 12 | 85 | 19 | 12 | 0 | 18.5 | 0.2 | DXGU0703**L/R... | 0.9 |

*Torque: Recommended torque (N·m) for clamping **$r_\varepsilon$: Standard corner radius
Note: Right-hand toolholders (R) are used with left-hand inserts (L). Left-hand toolholders (L) are used with right-hand inserts (R).

**SPARE PARTS**

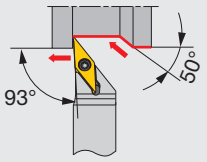
| Designation | Clamping screw | Coolant unit | Wrench |
|---|---|---|---|
| JSDJ2XR/L1212F07-CHP | SR34-514 | S-CU-CHP | T-7F |

JSDJXR-F, JSDJ2XR/L-CHP: Inserts → **B196 -**, Standard cutting conditions → **B198**

MINIFORCE TURN

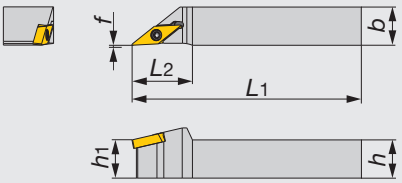
## JSVJ2XR/L

Screw-on toolholder without offset with 93° approach angle, for VXGU inserts




Cutting edge style **J2**

Without offset




Right hand (R) shown.

| Designation | *h* | *b* | $L_1$ | $L_2$ | $h_1$ | *f* | $r_\varepsilon$** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| JSVJ2XR/L1010X09 | 10 | 10 | 120 | 17 | 10 | 0 | 0.2 | VXGU09T2**L/R... | 0.9 |
| JSVJ2XR/L1212F09 | 12 | 12 | 85 | 19 | 12 | 0 | 0.2 | VXGU09T2**L/R... | 0.9 |
| JSVJ2XR/L1212X09 | 12 | 12 | 120 | 19 | 12 | 0 | 0.2 | VXGU09T2**L/R... | 0.9 |
| JSVJ2XR/L1616X09 | 16 | 16 | 120 | 19 | 16 | 0 | 0.2 | VXGU09T2**L/R... | 0.9 |
| JSVJ2XR/L2020H09 | 20 | 20 | 100 | 19 | 20 | 0 | 0.2 | VXGU09T2**L/R... | 0.9 |

*Torque: Recommended torque (N·m) for clamping **$r_\varepsilon$: Standard corner radius
Note: Right-hand toolholders (R) are used with left-hand inserts (L). Left-hand toolholders (L) are used with right-hand inserts (R).

**SPARE PARTS**

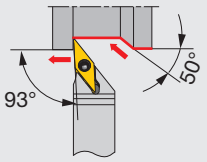



| Designation | Clamping screw | Wrench |
|---|---|---|
| JSVJ2XR/L... | SR34-508 | T-7F |

MINIFORCE TURN

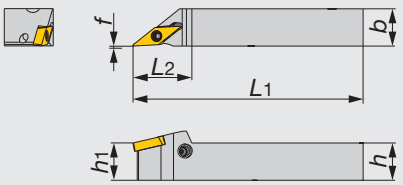
## JPVJ2XR/L

Side clamp toolholder without offset with 93° approach angle, for VXGU inserts




Cutting edge style **J2**

Without offset




Right hand (R) shown.

| Designation | *h* | *b* | $L_1$ | $L_2$ | $h_1$ | *f* | $r_\varepsilon$** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| JPVJ2XR/L1010X09 | 10 | 10 | 120 | 19 | 10 | 0 | 0.2 | VXGU09T2**L/R... | 0.9 |
| JPVJ2XR/L1212F09 | 12 | 12 | 85 | 19 | 12 | 0 | 0.2 | VXGU09T2**L/R... | 0.9 |
| JPVJ2XR/L1212X09 | 12 | 12 | 120 | 19 | 12 | 0 | 0.2 | VXGU09T2**L/R... | 0.9 |
| JPVJ2XR/L1616X09 | 16 | 16 | 120 | 19 | 16 | 0 | 0.2 | VXGU09T2**L/R... | 0.9 |

*Torque: Recommended torque (N·m) for clamping **$r_\varepsilon$: Standard corner radius
Note: Right-hand toolholders (R) are used with left-hand inserts (L). Left-hand toolholders (L) are used with right-hand inserts (R).

**SPARE PARTS**



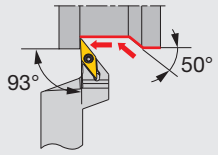



| Designation | Lever | Pin | Clamping screw | Wrench |
|---|---|---|---|---|
| JPVJ2XR/L... | SLLV-1 | SL-PI-2 | SR10400611 | HW2.0/5RED |

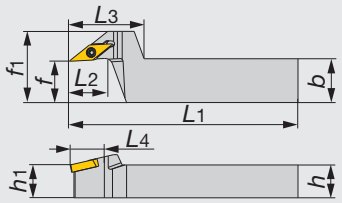
JSVJ2XR/L, JPVJ2XR/L: Inserts → **B197**, Standard cutting conditions → **B198**

## JSVJXR-F

Screw-on stepped-head toolholder with 93° approach angle, for VXGU inserts




Cutting edge style **J**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *L*3 | *L*4 | *h*1 | *f* | *f*1 | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JSVJXR1016X09-F15 | 10 | 16 | 120 | 12 | 27 | 19 | 10 | 15 | 26 | 0.2 | VXGU09T2**L... | 0.9 |
| JSVJXR1216F09-F15 | 12 | 16 | 85 | 12 | 27 | 19 | 12 | 15 | 26 | 0.2 | VXGU09T2**L... | 0.9 |
| JSVJXR1216X09-F15 | 12 | 16 | 120 | 12 | 27 | 19 | 12 | 15 | 26 | 0.2 | VXGU09T2**L... | 0.9 |
| JSVJXR1620X09-F15 | 16 | 20 | 120 | 12 | 27 | 19 | 16 | 15 | 26 | 0.2 | VXGU09T2**L... | 0.9 |

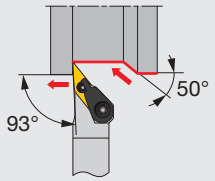
*Torque: Recommended torque (N·m) for clamping **$r_\varepsilon$: Standard corner radius
Note: Right-hand toolholders (R) are used with left-hand inserts (L).

**SPARE PARTS**

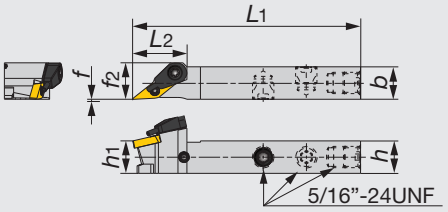
| Designation | Clamping screw | Wrench |
|---|---|---|
| JSVJXR**-F15 | SR34-508 | T-7F |

## JSVJ2XR/L-CHP

Screw-on toolholder without offset with 93° approach angle, for VXGU inserts, with coolant nozle for high pressure




Cutting edge style **J2**




Without offset

Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *f*2 | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| JSVJ2XR/L1212F09-CHP | 12 | 12 | 85 | 17.5 | 12 | 0 | 13.5 | 0.2 | VXGU09T2**L/R... | 0.9 |

*Torque: Recommended torque (N·m) for clamping **$r_\varepsilon$: Standard corner radius
Note: Right-hand toolholders (R) are used with left-hand inserts (L). Left-hand toolholders (L) are used with right-hand inserts (R).

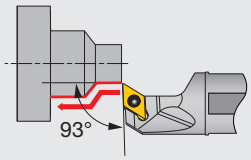
**SPARE PARTS**

| Designation | Clamping screw | Coolant unit | Wrench |
|---|---|---|---|
| JSVJ2XR/L1212F09-CHP | SR34-508 | S-CU-CHP | T-7F |

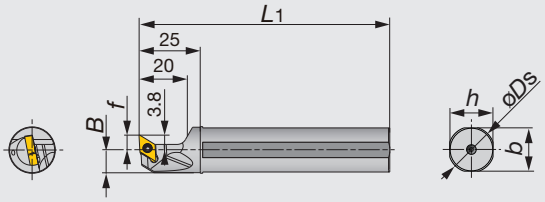
JSVJXR-F, JSVJ2XR/L-CHP: Inserts → **B197**, Standard cutting conditions → **B198**

## MINIFORCE TURN
## JS-SDUXL

Screw-on toolholder with 93° approach angle, for 55° rhombic insert with 4 edges




Cutting edge style **U**




Left hand (L) shown.

| Designation | øDs | f | L1 | h | b | B | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| JS14H-SDUXL07 | 14 | 6 | 100 | 13 | 6.75 | 6.75 | 0.2 | DXGU0703**L... | 0.9 |
| JS159F-SDUXL07 | 15.875 | 6 | 85 | 15 | 7.687 | 7.687 | 0.2 | DXGU0703**L... | 0.9 |
| JS16F-SDUXL07 | 16 | 6 | 85 | 15 | 7.75 | 7.75 | 0.2 | DXGU0703**L... | 0.9 |
| JS19G-SDUXL07 | 19.05 | 6 | 90 | 18 | 9.275 | 9.275 | 0.2 | DXGU0703**L... | 0.9 |
| JS19X-SDUXL07 | 19.05 | 6 | 120 | 18 | 9.275 | 9.275 | 0.2 | DXGU0703**L... | 0.9 |
| JS20G-SDUXL07 | 20 | 6 | 90 | 19 | 9.75 | 9.75 | 0.2 | DXGU0703**L... | 0.9 |
| JS20X-SDUXL07 | 20 | 6 | 120 | 19 | 9.75 | 9.75 | 0.2 | DXGU0703**L... | 0.9 |
| JS22X-SDUXL07 | 22 | 10 | 120 | 21 | 10.75 | 10.75 | 0.2 | DXGU0703**L... | 0.9 |
| JS25H-SDUXL07 | 25 | 10 | 100 | 24 | 12.25 | 12.25 | 0.2 | DXGU0703**L... | 0.9 |
| JS254X-SDUXL07 | 25.4 | 10 | 120 | 24 | 12.45 | 12.45 | 0.2 | DXGU0703**L... | 0.9 |

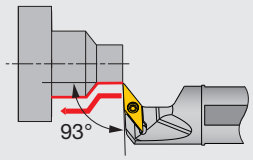
*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: Left-hand toolholders (L) are used with left-hand inserts (L).

**SPARE PARTS**

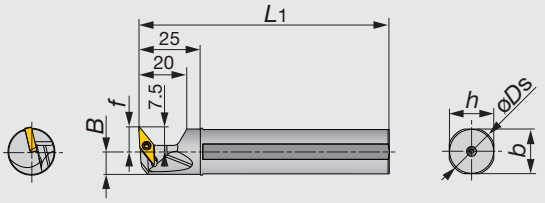
| Designation | Clamping screw | Wrench |
|---|---|---|
| JS**-SDUXL07 | SR34-514 | T-7F |

## MINIFORCE TURN
## JS-SVUXL

Screw-on toolholder with 93° approach angle, for VXGU inserts with 4 edges




Cutting edge style **U**




Left hand (L) shown.

| Designation | øDs | f | L1 | h | b | B | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| JS159F-SVUXL09 | 15.875 | 10 | 85 | 15 | 7.7 | 7.7 | 0.2 | VXGU09T2**L... | 0.9 |
| JS16F-SVUXL09 | 16 | 10 | 85 | 15 | 7.7 | 7.7 | 0.2 | VXGU09T2**L... | 0.9 |
| JS19G-SVUXL09 | 19.05 | 10 | 90 | 18 | 9.2 | 9.2 | 0.2 | VXGU09T2**L... | 0.9 |
| JS19X-SVUXL09 | 19.05 | 10 | 120 | 18 | 9.2 | 9.2 | 0.2 | VXGU09T2**L... | 0.9 |
| JS20G-SVUXL09 | 20 | 10 | 90 | 19 | 9.7 | 9.7 | 0.2 | VXGU09T2**L... | 0.9 |
| JS20X-SVUXL09 | 20 | 10 | 120 | 19 | 9.7 | 9.7 | 0.2 | VXGU09T2**L... | 0.9 |
| JS22X-SVUXL09 | 22 | 10 | 120 | 21 | 10.7 | 10.7 | 0.2 | VXGU09T2**L... | 0.9 |
| JS25H-SVUXL09 | 25 | 10 | 100 | 24 | 12.2 | 12.2 | 0.2 | VXGU09T2**L... | 0.9 |
| JS254X-SVUXL09 | 25.4 | 10 | 120 | 24 | 12.4 | 12.4 | 0.2 | VXGU09T2**L... | 0.9 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: Left-hand toolholders (L) are used with left-hand inserts (L).

**SPARE PARTS**

| Designation | Clamping screw | Wrench |
|---|---|---|
| JS**-SVUXL09 | SR34-508 | T-7F |

JS-SDUXL: Inserts → **B196 -**, Standard cutting conditions → **B198**

JS-SVUXL: Inserts → **B197**, Standard cutting conditions → **B198**

## INSERT



**Trigon, 80° with hole**

| | | |

● : Continuous cutting
ɔ : Light interrupted cutting
✻ : Heavy interrupted cutting

## INSERT



**Rhombic, 55° with hole**

| | | |
|---|---|---|
| P | Steel | ɔ ●ɔ |
| M | Stainless | ɔ ●ɔ |
| K | Cast iron | ɔ |
| N | Non-ferrous | |
| S | Superalloys | ● |
| H | Hard materials | |

| Application | Chipbreaker | Designation | Corner radius | Coating: AH725 | Coating: SH725 |
|---|---|---|---|---|---|
| Finishing (sharp edge) | JRP  | DXGU070301MFRE-JRP | <0.1* | | ● |
| | | DXGU070301MFLE-JRP | <0.1* | | ● |
| | | DXGU070302MFRE-JRP | <0.2* | | ● |
| | | DXGU070302MFLE-JRP | <0.2* | | ● |
| Finishing to medium cutting(sharp edge) | JTS  | DXGU070301MFR-JTS | <0.1* | | ● |
| | | DXGU070301MFL-JTS | <0.1* | | ● |
| | | DXGU070302MFR-JTS | <0.2* | | ● |
| | | DXGU070302MFL-JTS | <0.2* | | ● |
| Finishing to medium cutting | JTS  | DXGU070301MR-JTS | <0.1* | ● | |
| | | DXGU070301ML-JTS | <0.1* | ● | |
| | | DXGU070302MR-JTS | <0.2* | ● | |
| | | DXGU070302ML-JTS | <0.2* | ● | |
| Finishing (Low cutting force) (sharp edge) | JSS  | DXGU070301MFR-JSS | <0.1* | | ● |
| | | DXGU070301MFL-JSS | <0.1* | | ● |
| | | DXGU070302MFR-JSS | <0.2* | | ● |
| | | DXGU070302MFL-JSS | <0.2* | | ● |

* Corner radius has minus tolerance

● : Line-up

● : Continuous cutting
ɔ : Light interrupted cutting
❄ : Heavy interrupted cutting



## Rhombic, 55° with hole

| | | |
|---|---|---|
| P | Steel | ɔ ●ɔ ●ɔ |
| M | Stainless | ɔ |
| K | Cast iron | ɔ ●ɔ ●ɔ ● |
| N | Non-ferrous | ● |
| S | Superalloys | ● ● |
| H | Hard materials | |

| Application | Chipbreaker | Designation | Corner radius | Coating: AH725 | Coated cermet: GT9530 | Cermet: NS9530 | Uncoated: KS05F |
|---|---|---|---|---|---|---|---|
| Finishing (Low cutting force) | JSS | DXGU070301MR-JSS | <0.1* | ● | | | |
| |  | DXGU070301ML-JSS | <0.1* | ● | | | |
| | | DXGU070302MR-JSS | <0.2* | ● | | | |
| | | DXGU070302ML-JSS | <0.2* | ● | | | |
| Finishing to medium cutting | TS | DXGU070302R-TS | 0.2 | ● | ● | ● | ● |
| |  | DXGU070302L-TS | 0.2 | ● | ● | ● | ● |
| | | DXGU070304R-TS | 0.4 | ● | ● | ● | ● |
| | | DXGU070304L-TS | 0.4 | ● | ● | ● | ● |
| | | DXGU070308R-TS | 0.8 | ● | ● | ● | ● |
| | | DXGU070308L-TS | 0.8 | ● | ● | ● | ● |
| Finishing (Low cutting force) | SS | DXGU070302R-SS | 0.2 | ● | ● | ● | ● |
| |  | DXGU070302L-SS | 0.2 | ● | ● | ● | ● |
| | | DXGU070304R-SS | 0.4 | ● | ● | ● | ● |
| | | DXGU070304L-SS | 0.4 | ● | ● | ● | ● |

## Rhombic, 35° with hole

| | | |
|---|---|---|
| P | Steel | ●ɔ |
| M | Stainless | ●ɔ |
| K | Cast iron | |
| N | Non-ferrous | |
| S | Superalloys | |
| H | Hard materials | |

| Application | Chipbreaker | Designation | Corner radius | Coating: SH725 |
|---|---|---|---|---|
| Finishing (sharp edge) | JRP | VXGU09T201MFRE-JRP | <0.1* | ● |
| |  | VXGU09T201MFLE-JRP | <0.1* | ● |
| | | VXGU09T202MFRE-JRP | <0.2* | ● |
| | | VXGU09T202MFLE-JRP | <0.2* | ● |

* Corner radius has minus tolerance

● : Line-up

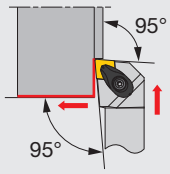
## STANDARD CUTTING CONDITIONS
FOR EXTERNAL TURNING

| Applications | ISO | Workpiece material | Priority | Chip-breaker | Grade | Cutting speed *Vc* (m/min) | Depth of cut *ap* (mm) | Feed *f* (mm/rev) |
|---|---|---|---|---|---|---|---|---|
| For swiss type automatic lathes | P | Low carbon steel E275A, etc. Carbon steel C45, etc. Low alloy steel 18CrMo4, etc. Alloy steel 42CrMo4, etc. | With high sharpness | JSS | SH725 | 50 - 180 | 0.1 - 1.5 | 0.03 - 0.1 |
| | | | First choice | JTS | AH725 | 50 - 180 | 0.1 - 2 | 0.03 - 0.1 |
| | M | Stainless steel (Austenitic) X5CrNi18-9, etc. Stainless steel (Martensitic and ferritic) X6Cr17, etc. Stainless steel (Precipitation hardened) X5CrNiCuNb16-4, etc. | First choice | JSS | SH725 | 50 - 180 | 0.1 - 1.5 | 0.03 - 0.1 |
| | | | For impact resistance | JTS | AH725 | 50 - 180 | 0.1 - 2 | 0.03 - 0.1 |
| For small size CNC lathes | P | Low carbon steel E275A, etc. Carbon steel C45, etc. Low alloy steel 18CrMo4, etc. Alloy steel 42CrMo4, etc. | First choice | SS | AH725 | 50 - 180 | 0.15 - 1.5 | 0.05 - 0.2 |
| | | | | TS | AH725 | 50 - 180 | 0.3 - 2 | 0.08 - 0.3 |
| | | | For improved surface finish | SS | NS9530 | 80 - 200 | 0.15 - 1.5 | 0.05 - 0.2 |
| | | | | TS | NS9530 | 80 - 200 | 0.3 - 2 | 0.08 - 0.3 |
| | | | For wear resistance | SS | GT9530 | 80 - 250 | 0.15 - 1.5 | 0.05 - 0.2 |
| | | | | TS | GT9530 | 80 - 250 | 0.3 - 2 | 0.08 - 0.3 |
| | M | Stainless steel (Austenitic) X5CrNi18-9, etc. Stainless steel (Martensitic and ferritic) X6Cr17, etc. Stainless steel (Precipitation hardened) X5CrNiCuNb16-4, etc. | First choice | SS | AH725 | 50 - 150 | 0.15 - 1.5 | 0.05 - 0.2 |
| | | | For impact resistance | TS | AH725 | 50 - 150 | 0.3 - 2 | 0.08 - 0.3 |

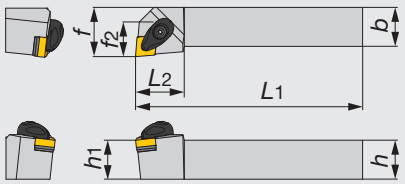
MEMO

## ISOETURN ACLNR/L-Eco

Double-clamp toolholder with 95° approach angle, for negative 80° rhombic inserts




Cutting edge style **L**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *f*2 | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| ACLNR/L2020K0904-A | 20 | 20 | 125 | 25 | 20 | 25 | 18 | 0.8 | CN**0904... | 3 |
| ACLNR/L2525M0904-A | 25 | 25 | 150 | 25 | 25 | 32 | 18 | 0.8 | CN**0904... | 3 |

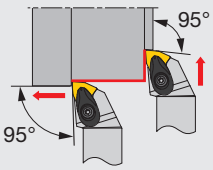
*Torque: Recommended torque (N·m) for clamping **$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

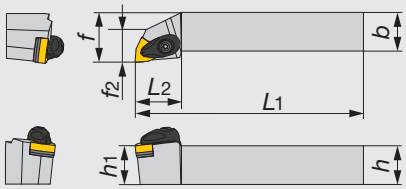
| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|---|---|
| ACLNR/L**0904-A | ACP3S-E | ACS-5W | BP-7 | SP-2.5 | ASC322 | CSTB-3.5 | T-15F |

## ISOETURN AWLNR/L-Eco

Double-clamp toolholder with 95° approach angle, for negative trigon inserts




Cutting edge style **L**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *f*2 | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| AWLNR/L2020K0604-A | 20 | 20 | 125 | 27 | 20 | 25 | 16 | 0.8 | WN**0604... | 3 |
| AWLNR/L2525M0604-A | 25 | 25 | 150 | 27 | 25 | 32 | 23 | 0.8 | WN**0604... | 3 |

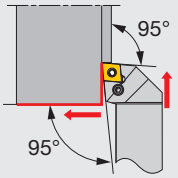
*Torque: Recommended torque (N·m) for clamping **$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

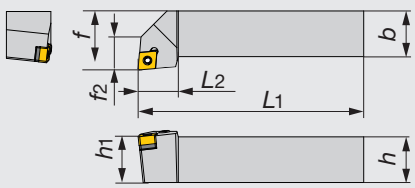
| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|---|---|
| AWLNR/L**0604-A | ACP3S-E | ACS-5W | BP-7 | SP-2.5 | ASW322 | CSTB-3.5 | T-15F |

## ISOETURN PCLNR/L-Eco

Lever lock type toolholder with 95° approach angle, for negative 80° rhombic inserts




Cutting edge style **L**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *f*2 | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| PCLNR/L2020K0904 | 20 | 20 | 125 | 20 | 20 | 25 | 15 | 0.8 | CN**0904... | 2 |
| PCLNR/L2525M0904 | 25 | 25 | 150 | 25 | 25 | 32 | 18 | 0.8 | CN**0904... | 2 |

*Torque: Recommended torque (N·m) for clamping **$r_\varepsilon$: Standard corner radius

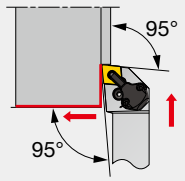
**SPARE PARTS**

| Designation | Shim | Clamping screw | Wrench | Spring pin | Lever |
|---|---|---|---|---|---|
| PCLNR/L**0904 | LSC317 | LCS3 | P-2.5 | LSP3 | LCL33 |

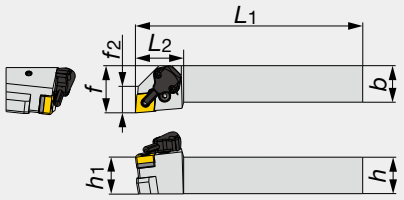
ACLNR/L-Eco, PCLNR/L-Eco: Inserts → **B050 -**, AWLNR/L-Eco: Inserts → **B090 -**

## PCLNR/L-CHP-Eco

Lever lock type toolholder with 95° approach angle, for negative 80° rhombic inserts with channels for high pressure coolant




Cutting edge style **L**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *f*2 | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| PCLNR/L2525M0904-CHP | 25 | 25 | 150 | 33 | 25 | 32 | 18 | 0.8 | CN**0904... | 2 |

*Torque: Recommended torque (N·m) for clamping **r*ε*: Standard corner radius

**SPARE PARTS**

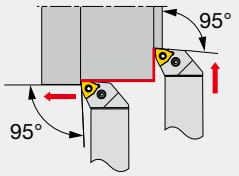
| Designation | Shim | Clamping screw | Wrench 1 | Spring pin | Lever |
|---|---|---|---|---|---|
| PCLNR/L2525M0904-CHP | LSC317 | LCS3 | P-2.5 | LSP3 | LCL33 |

**SPARE PARTS**

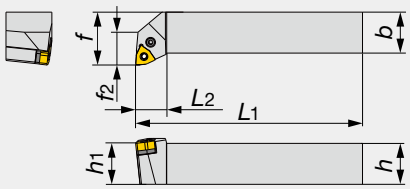
| Designation | Coolant unit | Mounting screw | Wrench 2 | O-ring | Coolant screw | Wrench 3 |
|---|---|---|---|---|---|---|
| PCLNR/L2525M0904-CHP | CU-CW-CHP | SRM3 | T-8F | OR6.4X0.9N | SRM4X4TL360 | P-2 |

## PWLNR/L-Eco

Lever lock type toolholder with 95° approach angle, for negative 80° trigon inserts




Cutting edge style **L**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *f*2 | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| PWLNR/L2020K0604 | 20 | 20 | 125 | 15 | 20 | 25 | 18 | 0.8 | WN**0604... | 2 |
| PWLNR/L2525M0604 | 25 | 25 | 150 | 19 | 25 | 32 | 20 | 0.8 | WN**0604... | 2 |

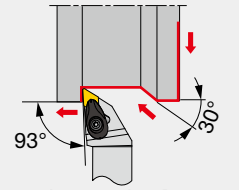
*Torque: Recommended torque (N·m) for clamping **r*ε*: Standard corner radius

**SPARE PARTS**

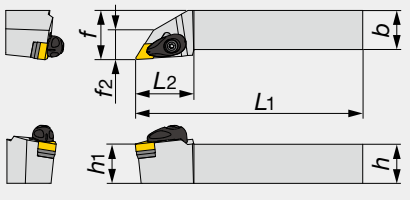
| Designation | Shim | Clamping screw | Wrench | Spring pin | Lever |
|---|---|---|---|---|---|
| PWLNR/L**0604 | LSW312 | LCS3 | P-2.5 | LSP3 | LCL3 |

## ADJNR/L-Eco

Double-clamp toolholder with 93° approach angle, for negative 55° rhombic inserts




Cutting edge style **J**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *f*2 | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| ADJNR/L2020K1104-A | 20 | 20 | 125 | 30 | 20 | 25 | 16 | 0.8 | DN**1104... | 3 |
| ADJNR/L2525M1104-A | 25 | 25 | 150 | 30 | 25 | 32 | 19 | 0.8 | DN**1104... | 3 |

*Torque: Recommended torque (N·m) for clamping **r*ε*: Standard corner radius

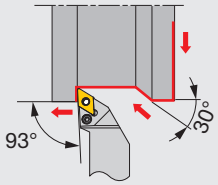
**SPARE PARTS**

| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|---|---|
| ADJNR/L**1104-A | ACP3S-E | ACS-5W | BP-7 | SP-2.5 | ASD322 | CSTB-3.5 | T-15F |

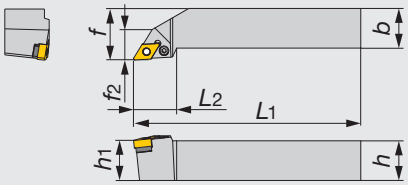
PCLNR/L-CHP-Eco: Inserts → **B050 -**, PWLNR/L-Eco: Inserts → **B090 -**, ADJNR/L-Eco: Inserts → **B061 -**

## ISOETURN
# PDJNR/L-Eco

Lever lock type toolholder with 93° approach angle, for negative 55° rhombic inserts




Cutting edge style **J**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *f*2 | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| PDJNR/L1616H1104 | 16 | 16 | 100 | 27 | 16 | 20 | 16 | 0.8 | DN**1104... | 2 |
| PDJNR/L2020K1104 | 20 | 20 | 125 | 27 | 20 | 25 | 16 | 0.8 | DN**1104... | 2 |
| PDJNR/L2525M1104 | 25 | 25 | 150 | 27 | 25 | 32 | 19 | 0.8 | DN**1104... | 2 |

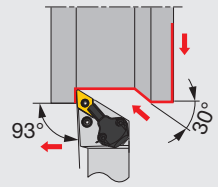
*Torque: Recommended torque (N·m) for clamping **$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

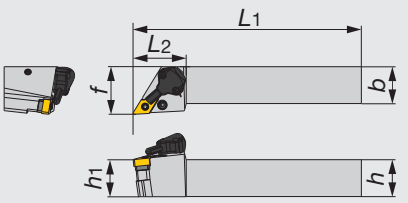
| Designation | Shim | Clamping screw | Wrench | Spring pin | Lever |
|---|---|---|---|---|---|
| PDJNR/L**1104 | ELSD32 | LCS3 | P-2.5 | LSP3 | LCL33L |

## ISOETURN
# PDJNR/L-CHP-Eco

Lever lock type toolholder with 93° approach angle, for negative 55° rhombic inserts, with channels for high pressure coolant




Cutting edge style **J**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| PDJNR/L2525M1104-CHP | 25 | 25 | 150 | 36 | 25 | 32 | 0.8 | DN**1104... | 2 |

*Torque: Recommended torque (N·m) for clamping **$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

| Designation | Shim | Clamping screw | Wrench 1 | Spring pin | Lever |
|---|---|---|---|---|---|
| PDJNR/L2525M1104-CHP | ELSD32 | LCS3 | P-2.5 | LSP3 | LCL33L |

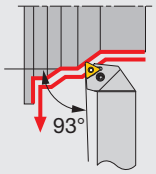
**SPARE PARTS**

| Designation | Coolant unit | Mounting screw | Wrench 2 | O-ring | Coolant screw | Wrench 3 |
|---|---|---|---|---|---|---|
| PDJNR/L2525M1104-CHP | CU-D-CHP | SRM3 | T-8F | OR6.4X0.9N | SRM4X4TL360 | P-2 |

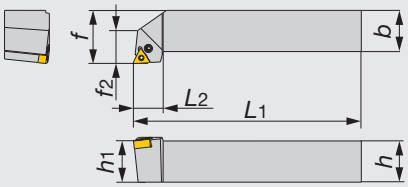
PDJNR/L-Eco, PDJNR/L-CHP-Eco: Inserts → **B061 -**

## PTJNR/L-Eco

Lever lock type toolholder with 93° approach angle, for negative triangle inserts




Cutting edge style **J**




Right hand (R) shown.

| Designation | *h* | *b* | $L_1$ | $L_2$ | $h_1$ | *f* | $f_2$ | $r_\varepsilon$** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| PTJNR/L2525M1104 | 25 | 25 | 150 | 18 | 25 | 32 | 20 | 0.8 | TN**1104... | 2 |

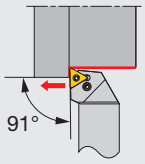
*Torque: Recommended torque (N·m) for clamping **$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

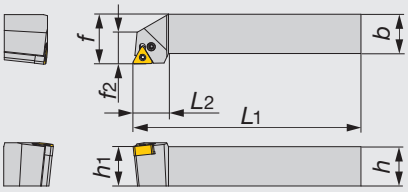
| Designation | Clamping screw | Wrench | Lever |
|---|---|---|---|
| PTJNR/L2525M1104 | LCS23A | P-2.5 | LCL23 |

## PTGNR/L-Eco

Lever lock type toolholder with 91° approach angle, for negative triangle inserts




Cutting edge style **G**




Right hand (R) shown.

| Designation | *h* | *b* | $L_1$ | $L_2$ | $h_1$ | *f* | $f_2$ | $r_\varepsilon$** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| PTGNR/L2020K1104 | 20 | 20 | 125 | 20 | 20 | 25 | 15 | 0.8 | TN**1104... | 2 |
| PTGNR/L2525M1104 | 25 | 25 | 150 | 20 | 25 | 32 | 22.5 | 0.8 | TN**1104... | 2 |

*Torque: Recommended torque (N·m) for clamping **$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

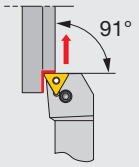
| Designation | Clamping screw | Wrench | Lever |
|---|---|---|---|
| PTGNR/L**1104 | LCS23A | P-2.5 | LCL23 |



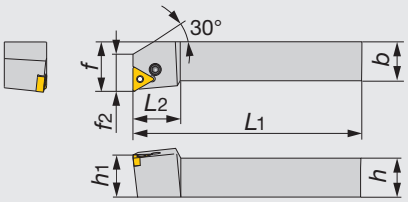
PTJNR/L-Eco, PTGNR/L-Eco: Inserts → **B080 -**

## ISOETURN
### PTFNR/L-Eco

Lever lock type toolholder for facing with 91° approach angle, for negative triangle inserts




Cutting edge style **F**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *f*2 | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| PTFNR/L2020K1104 | 20 | 20 | 125 | 16 | 20 | 25 | 16 | 0.8 | TN**1104... | 2 |
| PTFNR/L2525M1104 | 25 | 25 | 150 | 22 | 25 | 32 | 20 | 0.8 | TN**1104... | 2 |

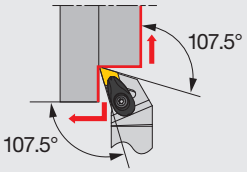
*Torque: Recommended torque (N·m) for clamping **$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

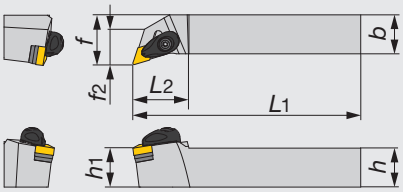
| Designation | Clamping screw | Wrench | Lever |
|---|---|---|---|
| PTFNR/L**1104 | LCS23A | P-2.5 | LCL23 |

## ISOETURN
### ADQNR/L-Eco

Double-clamp toolholder with 107.5° approach angle, for negative 55° rhombic inserts




Cutting edge style **Q**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *f*2 | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| ADQNR/L2020K1104-A | 20 | 20 | 125 | 30 | 20 | 25 | 18 | 0.8 | DN**1104... | 3 |
| ADQNR/L2525M1104-A | 25 | 25 | 150 | 30 | 25 | 32 | 20 | 0.8 | DN**1104... | 3 |

*Torque: Recommended torque (N·m) for clamping **$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|---|---|
| ADQNR/L**1104-A | ACP3S-E | ACS-5W | BP-7 | SP-2.5 | ASD322 | CSTB-3.5 | T-15F |

PTFNR/L-Eco: Inserts → **B080 -**

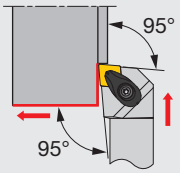
ADQNR/L-Eco: Inserts → **B061 -**

MEMO

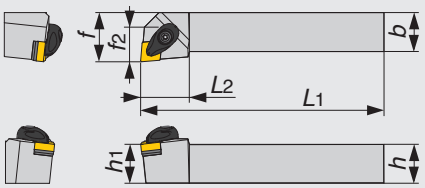
## ACLNR/L

Double-clamp toolholder with 95° approach angle, for negative 80° rhombic inserts






Cutting edge style **L**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | f2 | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| ACLNR/L2020K12-A | 20 | 20 | 125 | 26 | 20 | 25 | 19 | 0.8 | CN**1204... | 3 |
| ACLNR/L2525M12-A | 25 | 25 | 150 | 30 | 25 | 32 | 21 | 0.8 | CN**1204... | 3 |
| ACLNR/L3225P12-A | 32 | 25 | 170 | 30 | 32 | 32 | 21 | 0.8 | CN**1204... | 3 |
| ACLNR/L2525M16-A | 25 | 25 | 150 | 31 | 25 | 32 | 22 | 1.2 | CN**1606... | 6.4 |
| ACLNR/L3225P16-A | 32 | 25 | 170 | 31 | 32 | 32 | 22 | 1.2 | CN**1606... | 6.4 |
| ACLNR/L3232P16-A | 32 | 32 | 170 | 31 | 32 | 40 | 22 | 1.2 | CN**1606... | 6.4 |
| ACLNR/L3232P19-A | 32 | 32 | 170 | 40 | 32 | 40 | 25 | 1.2 | CN**1906... | 6.4 |
| ACLNR/L4040S19-A | 40 | 40 | 250 | 40 | 40 | 50 | 25 | 1.2 | CN**1906... | 6.4 |

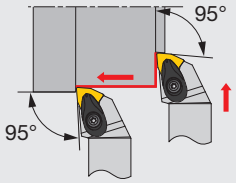
*Torque: Recommended torque (N·m) for clamping
**rε: Standard corner radius

### SPARE PARTS

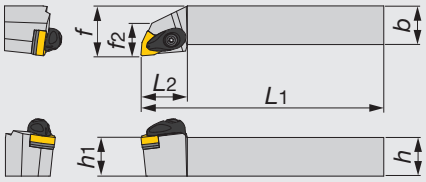
| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|---|---|
| ACLNR/L**12-A | ACP4S | ACS-5W | BP-7 | SP-2.5 | ASC422 | CSTB-3.5 | T-15F | - |
| ACLNR/L**16-A | ACP5S | ACS-6W | BP-8.8 | SP-2.5 | ASC533 | CSTB-5 | - | KEYV-T20 |
| ACLNR/L**19-A | ACP6S | ACS-6W | BP-8.8 | SP-2.5 | ASC634 | CSTB-5 | - | KEYV-T20 |

## AWLNR/L

Double-clamp toolholder with 95° approach angle, for negative trigon inserts




Cutting edge style **L**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | f2 | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| AWLNR/L2020K06-A | 20 | 20 | 125 | 27 | 20 | 25 | 16 | 0.8 | WN**0604... | 3 |
| AWLNR/L2020K08-A | 20 | 20 | 125 | 30 | 20 | 25 | 19 | 0.8 | WN**0804... | 3 |
| AWLNR/L2525M06-A | 25 | 25 | 150 | 27 | 25 | 32 | 23 | 0.8 | WN**0604... | 3 |
| AWLNR/L2525M08-A | 25 | 25 | 150 | 30 | 25 | 32 | 21 | 0.8 | WN**0804... | 3 |
| AWLNR/L3225P08-A | 32 | 25 | 170 | 30 | 32 | 32 | 21 | 0.8 | WN**0804... | 3 |

*Torque: Recommended torque (N·m) for clamping
**rε: Standard corner radius

### SPARE PARTS

| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|---|---|
| AWLNR/L**06-A | ACP3S | ACS-5W | BP-7 | SP-2.5 | ASW322 | CSTB-3.5 | T-15F |
| AWLNR/L**08-A | ACP4S | ACS-5W | BP-7 | SP-2.5 | ASW422 | CSTB-3.5 | T-15F |

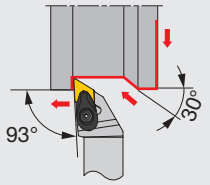
ACLNR/L: Inserts → **B050 -**, CBN → **B163 -**, PCD → **B176**

AWLNR/L: Inserts → **B090 -**, CBN → **B165**

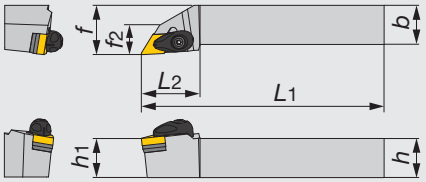
# TURNING

## ADJNR/L

Double-clamp toolholder with 93° approach angle, for negative 55° rhombic inserts




Cutting edge style **J**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *f*2 | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| ADJNR/L2020K15-A | 20 | 20 | 125 | 36 | 20 | 25 | 17 | 0.8 | DN**1504... | 3 |
| ADJNR/L2020K1506-A | 20 | 20 | 125 | 36 | 20 | 25 | 17 | 0.8 | DN**1506... | 3 |
| ADJNR/L2525M15-A | 25 | 25 | 150 | 36 | 25 | 32 | 18 | 0.8 | DN**1504... | 3 |
| ADJNR/L2525M1506-A | 25 | 25 | 150 | 36 | 25 | 32 | 18 | 0.8 | DN**1506... | 3 |
| ADJNR/L3225P15-A | 32 | 25 | 170 | 36 | 32 | 32 | 18 | 0.8 | DN**1504... | 3 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

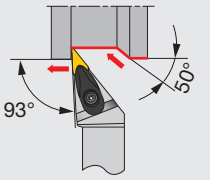
### SPARE PARTS

| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|---|---|
| ADJNR/L**15-A | ACP4S | ACS-5W | BP-7 | SP-2.5 | ASD432 | CSTB-3.5 | T-15F |
| ADJNR/L**1506-A | ACP4S | ACS-5W | BP-7 | SP-2.5 | ASD423 | CSTB-3.5 | T-15F |

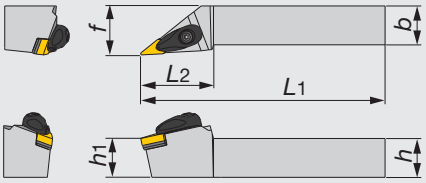
# TURNING

## AVJNR/L

Double-clamp toolholder with 93° approach angle, for negative 35° and 25° rhombic inserts




Cutting edge style **J**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| AVJNR/L2020K16-A | 20 | 20 | 125 | 43 | 20 | 25 | 0.8 | V/YN**1604... | 3 |
| AVJNR/L2525M16-A | 25 | 25 | 150 | 46 | 25 | 32 | 0.8 | V/YN**1604... | 3 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|---|---|
| AVJNR/L**16-A | ACP3L | ACS-5W | BP-7 | SP-2.5 | ASV322 | CSTB-3.5 | T-15F |

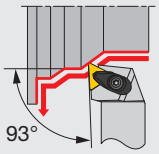

ADJNR/L: Inserts → **B061 -**, CBN → **B163 -**, PCD → **B176**

AVJNR/L: Inserts → **B097 -**, CBN → **B165 -**, PCD → **B176**

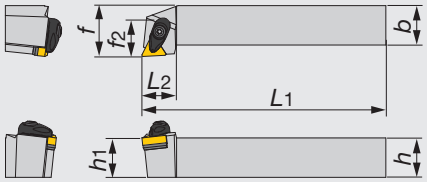
# TURNING A

## ATJNR/L

Double-clamp toolholder with 93° approach angle, for negative triangle inserts




Cutting edge style **J**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *f*2 | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| ATJNR/L2020K16-A | 20 | 20 | 125 | 22 | 20 | 25 | 23 | 0.8 | TN**1604... | 3 |
| ATJNR/L2525M16-A | 25 | 25 | 150 | 22 | 25 | 32 | 25 | 0.8 | TN**1604... | 3 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

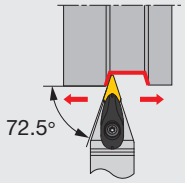
**SPARE PARTS**

| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|---|---|
| ATJNR/L**16-A | ACP3S | ACS-5W | BP-7 | SP-2.5 | AST322 | CSTB-3.5 | T-15F |

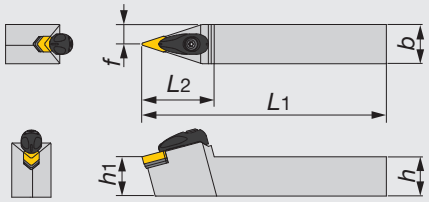
# TURNING A

## AVVNN

Double-clamp toolholder with 72.5° approach angle, for negative 35° and 25° rhombic inserts




Cutting edge style **V**




| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| AVVNN2020K16-A | 20 | 20 | 125 | 46 | 20 | 10 | 0.8 | V/YN**1604... | 3 |
| AVVNN2525M16-A | 25 | 25 | 150 | 46 | 25 | 12.5 | 0.8 | V/YN**1604... | 3 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

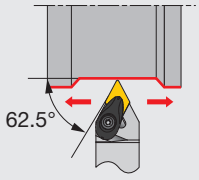
**SPARE PARTS**

| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|---|---|
| AVVNN**16-A | ACP3L | ACS-5W | BP-7 | SP-2.5 | ASV322 | CSTB-3.5 | T-15F |

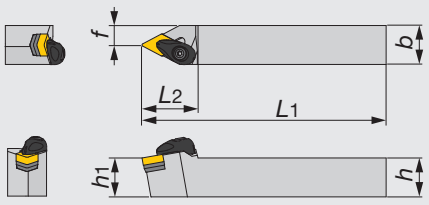
# TURNING A

## ADPNN

Double-clamp toolholder with 62.5° approach angle, for negative 55° rhombic inserts




Cutting edge style **P**




| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| ADPNN2020K15-A | 20 | 20 | 125 | 36 | 20 | 7.5 | 0.8 | DN**1504... | 3 |
| ADPNN2525M15-A | 25 | 25 | 150 | 36 | 25 | 12.5 | 0.8 | DN**1504... | 3 |

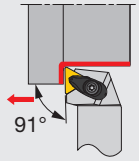
*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

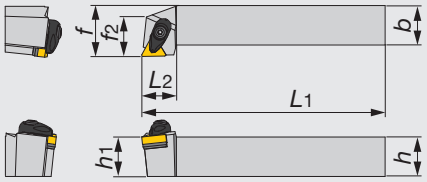
| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|---|---|
| ADPNN**15-A | ACP4S | ACS-5W | BP-7 | SP-2.5 | ASD432 | CSTB-3.5 | T-15F |

## ATGNR/L

Double-clamp toolholder with 91° approach angle, for negative triangle inserts




Cutting edge style **G**




Right hand (R) shown.

| Designation | h | b | $L_1$ | $L_2$ | $h_1$ | f | $f_2$ | $r_\varepsilon$** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| ATGNR/L2020K16-A | 20 | 20 | 125 | 22 | 20 | 25 | 22 | 0.8 | TN**1604... | 3 |
| ATGNR/L2525M16-A | 25 | 25 | 150 | 22 | 25 | 32 | 25 | 0.8 | TN**1604... | 3 |
| ATGNR/L2525M22-A | 25 | 25 | 150 | 26 | 25 | 32 | 26 | 0.8 | TN**2204... | 3 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

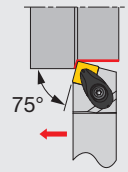
### SPARE PARTS

| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|---|---|
| ATGNR/L**16-A | ACP3S | ACS-5W | BP-7 | SP-2.5 | AST322 | CSTB-3.5 | T-15F |
| ATGNR/L**22-A | ACP4S | ACS-5W | BP-7 | SP-2.5 | AST422 | CSTB-3.5 | T-15F |

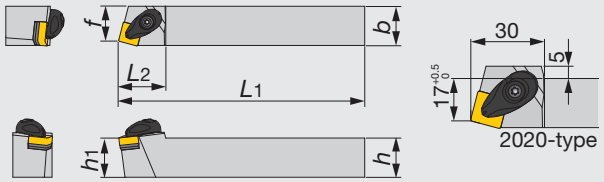


## ASBNR/L

Double-clamp toolholder with 75° approach angle, for negative square inserts




Cutting edge style **B**




Right hand (R) shown.

| Designation | h | b | $L_1$ | $L_2$ | $h_1$ | f | $r_\varepsilon$** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| ASBNR/L2020K12-A | 20 | 20 | 125 | 30 | 20 | 17 | 0.8 | SN**1204... | 3 |
| ASBNR/L2525M12-A | 25 | 25 | 150 | 30 | 25 | 22 | 0.8 | SN**1204... | 3 |
| ASBNR/L2525M15-A | 25 | 25 | 150 | 42.5 | 25 | 22 | 1.2 | SN**1506... | 6.4 |
| ASBNR/L3232P15-A | 32 | 32 | 170 | 42.5 | 32 | 27 | 1.2 | SN**1506... | 6.4 |
| ASBNR/L3232P19-A | 32 | 32 | 170 | 47.5 | 32 | 27 | 1.2 | SN**1906... | 6.4 |
| ASBNR/L4040S19-A | 40 | 40 | 250 | 47.5 | 40 | 35 | 1.2 | SN**1906... | 6.4 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|---|---|
| ASBNR/L**12-A | ACP4S | ACS-5W | BP-7 | SP-2.5 | ASS422 | CSTB-3.5 | T-15F | - |
| ASBNR/L**15-A | ACP5S | ACS-6W | BP-8.8 | SP-2.5 | ASS533 | CSTB-5 | - | KEYV-T20 |
| ASBNR/L**19-A | ACP6S | ACS-6W | BP-8.8 | SP-2.5 | ASS634 | CSTB-5 | - | KEYV-T20 |

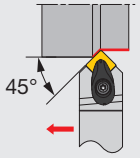
Ext. Toolholder

ATJNR/L, ATGNR/L: Inserts → **B079 -**, CBN → **B164**, PCD → **B176**
AVVNN: Inserts → **B097 -**, CBN → **B165 -**, PCD → **B176**
ADPNN: Inserts → **B061 -**, CBN → **B163 -**, PCD → **B176**
ASBNR/L: Inserts → **B070 -**, CBN → **B164 -**, PCD → **B176**

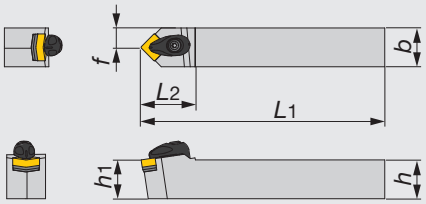
## ASDNN

Double-clamp toolholder with 45° approach angle, for negative square inserts






Cutting edge style **D**




| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| ASDNN2020K12-A | 20 | 20 | 125 | 35 | 20 | 10 | 0.8 | SN**1204... | 3 |
| ASDNN2525M12-A | 25 | 25 | 150 | 35 | 25 | 12.5 | 0.8 | SN**1204... | 3 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

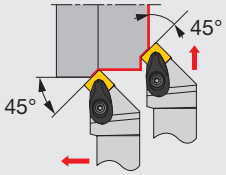
**SPARE PARTS**

| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|---|---|
| ASDNN**12-A | ACP4S | ACS-5W | BP-7 | SP-2.5 | ASS422 | CSTB-3.5 | T-15F |

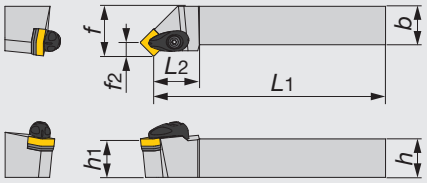
TURNING

## ASSNR/L

Double-clamp toolholder with 45° approach angle (S-style), for negative square inserts




Cutting edge style **S**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *f*2 | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| ASSNR/L2020K12-A | 20 | 20 | 125 | 30 | 20 | 25 | 8.3 | 0.8 | SN**1204... | 3 |
| ASSNR/L2525M12-A | 25 | 25 | 150 | 30 | 25 | 32 | 8.3 | 0.8 | SN**1204... | 3 |
| ASSNR/L2525M15-A | 25 | 25 | 150 | 25 | 25 | 32 | 10.3 | 1.2 | SN**1506... | 6.4 |
| ASSNR/L3232P15-A | 32 | 32 | 170 | 25 | 32 | 40 | 10.3 | 1.2 | SN**1506... | 6.4 |
| ASSNR/L3232P19-A | 32 | 32 | 170 | 27.5 | 32 | 40 | 12.5 | 1.2 | SN**1906... | 6.4 |
| ASSNR/L4040S19-A | 40 | 40 | 250 | 27.5 | 40 | 50 | 12.5 | 1.2 | SN**1906... | 6.4 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

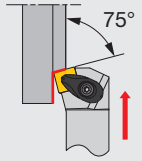
| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|---|---|
| ASSNR/L**12-A | ACP4S | ACS-5W | BP-7 | SP-2.5 | ASS422 | CSTB-3.5 | T-15F | - |
| ASSNR/L**15-A | ACP5S | ACS-6W | BP-8.8 | SP-2.5 | ASS533 | CSTB-5 | - | KEYV-T20 |
| ASSNR/L**19-A | ACP6S | ACS-6W | BP-8.8 | SP-2.5 | ASS634 | CSTB-5 | - | KEYV-T20 |

ASDNN, ASSNR/L: Inserts → **B070 -**, CBN → **B164**, PCD → **B176**

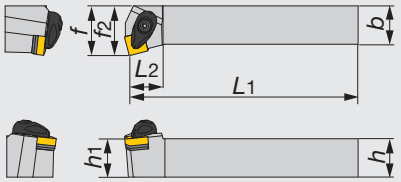
# TURNING A

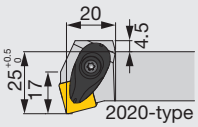
## ASKNR/L

Double-clamp toolholder with 75° approach angle, for negative square inserts




Cutting edge style **K**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *f*2 | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| ASKNR/L2020K12-A | 20 | 20 | 125 | 20 | 20 | 25 | 17 | 0.8 | SN**1204... | 3 |
| ASKNR/L2525M12-A | 25 | 25 | 150 | 22 | 25 | 32 | 21 | 0.8 | SN**1204... | 3 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

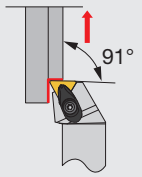
**SPARE PARTS**

| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|---|---|
| ASKNR/L**12-A | ACP4S | ACS-5W | BP-7 | SP-2.5 | ASS422 | CSTB-3.5 | T-15F |

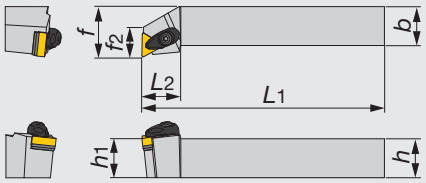
# TURNING A

## ATFNR/L

Double-clamp toolholder for facing with 91° approach angle, negative triangle inserts




Cutting edge style **F**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *f*2 | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| ATFNR/L2020K16-A | 20 | 20 | 125 | 25 | 20 | 25 | 18 | 0.8 | TN**1604... | 3 |
| ATFNR/L2525M16-A | 25 | 25 | 150 | 25 | 25 | 32 | 19 | 0.8 | TN**1604... | 3 |
| ATFNR/L2525M22-A | 25 | 25 | 150 | 29 | 25 | 32 | 23 | 0.8 | TN**2204... | 3 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|---|---|
| ATFNR/L**16-A | ACP3S | ACS-5W | BP-7 | SP-2.5 | AST322 | CSTB-3.5 | T-15F |
| ATFNR/L**22-A | ACP4S | ACS-5W | BP-7 | SP-2.5 | AST422 | CSTB-3.5 | T-15F |

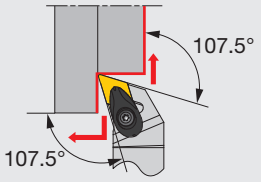

ASKNR/L: Inserts → **B070 -**, CBN → **B164**, PCD → **B176**

ATFNR/L: Inserts → **B079 -**, CBN → **B164 -**, PCD → **B176**

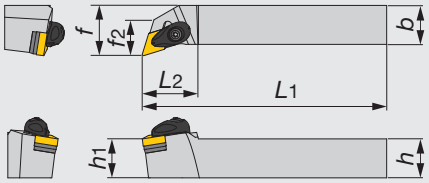
# TURNINGA

## ADQNR/L

Double-clamp toolholder with 107.5° approach angle, for negative 55° rhombic inserts




Cutting edge style **Q**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *f*2 | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| ADQNR/L2020K15-A | 20 | 20 | 125 | 32 | 20 | 25 | 21 | 0.8 | DN**1504... | 3 |
| ADQNR/L2020K1506-A | 20 | 20 | 125 | 32 | 20 | 25 | 21 | 0.8 | DN**1506... | 3 |
| ADQNR/L2525M15-A | 25 | 25 | 150 | 36 | 25 | 32 | 23 | 0.8 | DN**1504... | 3 |
| ADQNR/L2525M1506-A | 25 | 25 | 150 | 36 | 25 | 32 | 23 | 0.8 | DN**1506... | 3 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

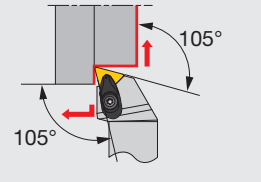
**SPARE PARTS**

| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|---|---|
| ADQNR/L**15-A | ACP4S | ACS-5W | BP-7 | SP-2.5 | ASD432 | CSTB-3.5 | T-15F |
| ADQNR/L**1506-A | ACP4S | ACS-5W | BP-7 | SP-2.5 | ASD423 | CSTB-3.5 | T-15F |

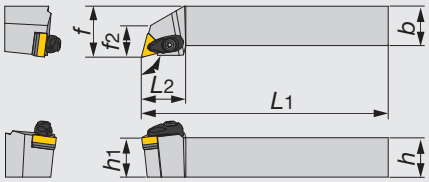
# TURNINGA

## ATQNR/L

Double-clamp toolholder with 105° approach angle, for negative triangle inserts




Cutting edge style **Q**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *f*2 | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| ATQNR/L2020K16-A | 20 | 20 | 125 | 28 | 20 | 25 | 18 | 0.8 | TN**1604... | 3 |
| ATQNR/L2525M16-A | 25 | 25 | 150 | 28 | 25 | 32 | 20 | 0.8 | TN**1604... | 3 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|---|---|
| ATQNR/L**16-A | ACP3S | ACS-5W | BP-7 | SP-2.5 | AST322 | CSTB-3.5 | T-15F |

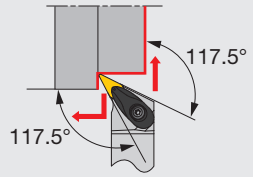
ADQNR/L: Inserts → **B061 -**, CBN → **B163 -**, PCD → **B176**

ATQNR/L: Inserts → **B079 -**, CBN → **B164 -**, PCD → **B176**

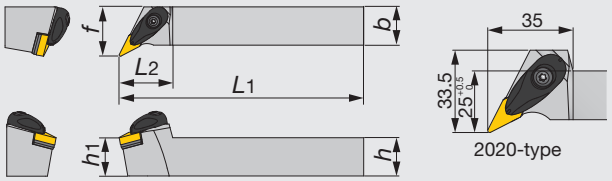
# TURNING

## AVQNR/L

Double-clamp toolholder with 117.5° approach angle, for negative 35° or 25° rhombic inserts




Cutting edge style **Q**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| AVQNR/L2020K16-A | 20 | 20 | 125 | 35 | 20 | 25 | 0.8 | V/YN**1604... | 3 |
| AVQNR/L2525M16-A | 25 | 25 | 150 | 35 | 25 | 32 | 0.8 | V/YN**1604... | 3 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

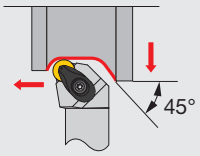
**SPARE PARTS**

| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|---|---|
| AVQNR/L... | ACP3L | ACS-5W | BP-7 | SP-2.5 | ASV322 | CSTB-3.5 | T-15F |

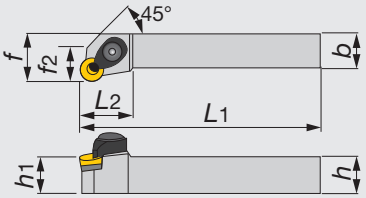
# TURNING

## ARGNR/L

Double-clamp toolholder with 91° approach angle, for negative round inserts




Cutting edge style **G**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *f*2 | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| ARGNR/L2525M12-A | 25 | 25 | 150 | 28 | 25 | 32 | 20 | 6.35 | RN**120400 | 3 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

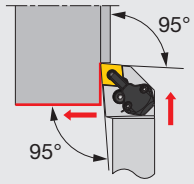
| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|---|---|
| ARGNR/L... | ACP4S | ACS-5W | BP-7 | SP-2.5 | ASR420 | CSTB-3.5 | T-15F |


AVQNR/L: Inserts → **B097 -**, CBN → **B165 -**, PCD → **B176**

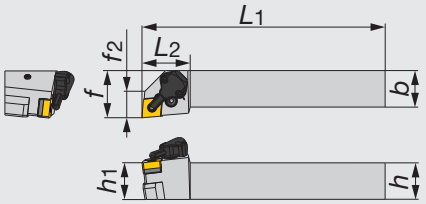
ARGNR/L: Inserts → **B102**

## PCLNR/L-CHP

Lever lock type toolholder with 95° approach angle, for negative 80° rhombic inserts, with channels for high pressure coolant




Cutting edge style **L**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *f*2 | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| PCLNR/L2525M12-CHP | 25 | 25 | 150 | 33 | 25 | 32 | 18 | 0.8 | CN**1204... | 3 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

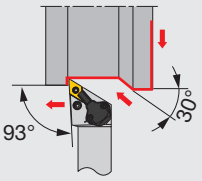
| Designation | Shim | Clamping screw | Wrench 1 | Spring pin | Lever |
|---|---|---|---|---|---|
| PCLNR/L2525M12-CHP | LSC42 | LCS4 | P-3 | LSP4 | LCL4 |

**SPARE PARTS**

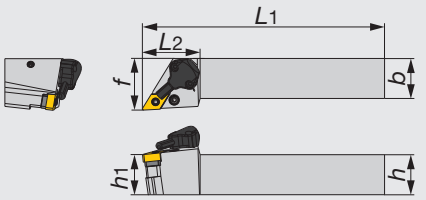
| Designation | Coolant unit | Mounting screw | Wrench 2 | O-ring | Coolant screw | Wrench 3 |
|---|---|---|---|---|---|---|
| PCLNR/L2525M12-CHP | CU-CW-CHP | SRM3 | T-8F | OR6.4X0.9N | SRM4X4TL360 | P-2 |

## PDJNR/L-CHP

Lever lock type toolholder with 93° approach angle, for negative 55° rhombic inserts, with channels for high pressure coolant




Cutting edge style **J**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| PDJNR/L2525M15-CHP | 25 | 25 | 150 | 36 | 25 | 32 | 0.8 | DN**1504... | 3 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

| Designation | Shim | Clamping screw | Wrench 1 | Spring pin | Lever |
|---|---|---|---|---|---|
| PDJNR/L2525M15-CHP | LSD43A | LCS4 | P-3 | LSP4 | LCL4 |

**SPARE PARTS**

| Designation | Coolant unit | Mounting screw | Wrench 2 | O-ring | Coolant screw | Wrench 3 |
|---|---|---|---|---|---|---|
| PDJNR/L2525M15-CHP | CU-D-CHP | SRM3 | T-8F | OR6.4X0.9N | SRM4X4TL360 | P-2 |

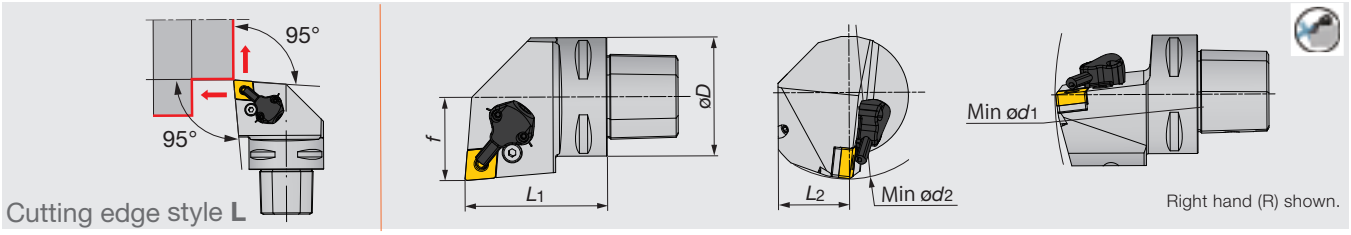
PCLNR/L-CHP: Inserts → **B050 -**, CBN → **B163 -**, PCD → **B176**

PDJNR/L-CHP: Inserts → **B061 -**, CBN → **B163 -**, PCD → **B176**

C-PCLN-CHP, C-PWLN-CHP, C-PDJN-CHP:
Inserts → **B050 -**, CBN → **B163 -**, PCD → **B176**

## TUNGTJET URN C-PCLN-CHP

Lever lock type toolholder with TungCap connection, for negative inserts, C 80° rhombic with channels for high pressure coolant

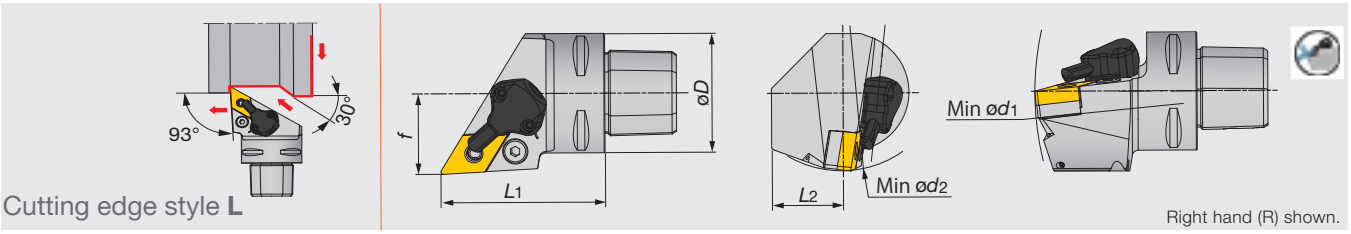



| Designation | øD | L1 | L2 | f | ød1 | ød2 | $r_\varepsilon$** | Insert |
|---|---|---|---|---|---|---|---|---|
| C4PCLNR/L27050-0904-CHP | 40 | 50 | 25 | 27 | 140 | 110 | 0.8 | CN**0904... |
| C4PCLNR/L27050-12-CHP | 40 | 50 | 25 | 27 | 140 | 110 | 0.8 | CN**1204... |
| C5PCLNR/L35060-12-CHP | 50 | 60 | 32 | 35 | 165 | 110 | 0.8 | CN**1204... |
| C6PCLNR/L45065-0904-CHP | 63 | 65 | 41 | 45 | 190 | 125 | 0.8 | CN**0904... |
| C6PCLNR/L45065-12-CHP | 63 | 65 | 41 | 45 | 190 | 125 | 0.8 | CN**1204... |

**$r_\varepsilon$: Standard corner radius

## TUNGTJET URN C-PDJN-CHP

Lever lock type toolholder with TungCap connection, for negative inserts, D 55° rhombic with channels for high pressure coolant

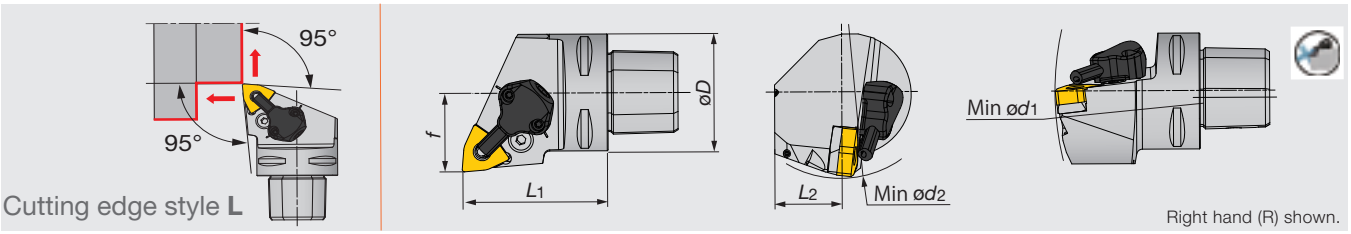



| Designation | øD | L1 | L2 | f | ød1 | ød2 | $r_\varepsilon$** | Insert |
|---|---|---|---|---|---|---|---|---|
| C4PDJNR/L27050-1104-CHP | 40 | 50 | 25 | 27 | 140 | 110 | 0.8 | DN**1104... |
| C4PDJNR/L27050-15-CHP | 40 | 50 | 25 | 27 | 140 | 110 | 0.8 | DN**1504(06)... |
| C5PDJNR/L35060-15-CHP | 50 | 60 | 32 | 35 | 165 | 110 | 0.8 | DN**1504(06)... |
| C6PDJNR/L45065-1104-CHP | 63 | 65 | 41 | 45 | 190 | 110 | 0.8 | DN**1104... |
| C6PDJNR/L45065-15-CHP | 63 | 65 | 41 | 45 | 190 | 110 | 0.8 | DN**1504(06)... |

**$r_\varepsilon$: Standard corner radius

## TUNGTJET URN C-PWLN-CHP

Lever lock type toolholder with TungCap connection, for negative inserts, W 80° trigon with channels for high pressure coolant




| Designation | øD | L1 | L2 | f | ød1 | ød2 | $r_\varepsilon$** | Insert |
|---|---|---|---|---|---|---|---|---|
| C4PWLNR/L27050-0604-CHP | 40 | 50 | 25 | 27 | 140 | 110 | 0.8 | WN**0604... |
| C4PWLNR/L27050-08-CHP | 40 | 50 | 25 | 27 | 140 | 110 | 0.8 | WN**0804... |
| C6PWLNR/L45065-08-CHP | 63 | 65 | 41 | 45 | 190 | 125 | 0.8 | WN**0804... |

**$r_\varepsilon$: Standard corner radius

### SPARE PARTS FOR P-TYPE

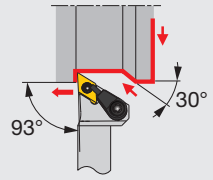
| Designation | Shim | Clamping screw | Wrench 1 | Spring pin | Lever |
|---|---|---|---|---|---|
| C*PCLNR/L**-12-CHP | LSC42 | LCS4 | P-3 | LSP4 | LCL4 |
| C*PWLNR/L**-08-CHP | LSW42BL | LCS4 | P-3 | LSP4 | LCL4 |
| C*PDJNR/L**-15-CHP | LSD43A | LCS4 | P-3 | LSP4 | LCL4 |
| C*PCLNR/L**0904-CHP | LSC317 | LCS3 | P-2.5 | LSP3 | LCL33 |
| C*PWLNR/L**0604-CHP | LSW312 | LCS3 | P-2.5 | LSP3 | LCL3 |
| C*PDJNR/L**1104-CHP | ELSD32 | LCS3 | P-2.5 | LSP3 | LCL33L |

### COOLANT SET

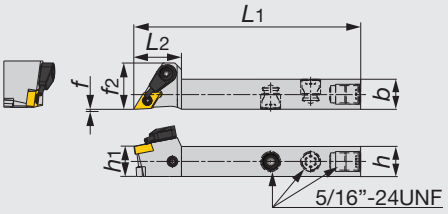
| Designation | Coolant unit | Mounting screw | Wrench 2 | O-ring |
|---|---|---|---|---|
| C*PCLNR/L**-CHP | CU-CW-CHP | SRM3 | T-8F | OR6.4X0.9N |
| C*PWLNR/L**-CHP | CU-CW-CHP | SRM3 | T-8F | OR6.4X0.9N |
| C*PDJLNR/L**-CHP | CU-D-CHP | SRM3 | T-8F | OR6.4X0.9N |

## JSDJ2XR/L-CHP

Screw-on toolholder without offset with 93° approach angle, for DXGU inserts, with channels for high pressure coolant




Cutting edge style **J2**




Without offset

Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | f2 | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| JSDJ2XR/L1212F07-CHP | 12 | 12 | 85 | 19 | 12 | 0 | 18.5 | 0.2 | DXGU0703**L/R... | 0.9 |

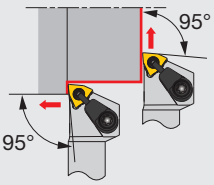
*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: Right-hand toolholders (R) are used with left-hand inserts (L). Left-hand toolholders (L) are used with right-hand inserts (R).

**SPARE PARTS**

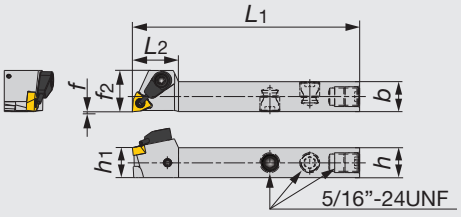
| Designation | Clamping screw | Coolant unit | Wrench |
|---|---|---|---|
| JSDJ2XR/L1212F07-CHP | SR34-514 | S-CU-CHP | T-7F |

## JSWL2XR/L-CHP

Screw-on toolholder offset with 95° approach angle, for WXGU inserts, with channels for high pressure coolant




Cutting edge style **L2**




Without offset

Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | f2 | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| JSWL2XR/L1212F04-CHP | 12 | 12 | 85 | 18 | 12 | 0 | 16.5 | 0.2 | WXGU0403**L/R... | 0.9 |

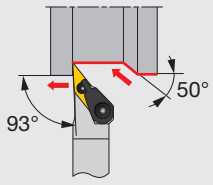
*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: Right-hand toolholders (R) are used with left-hand inserts (L). Left-hand toolholders (L) are used with right-hand inserts (R).

**SPARE PARTS**

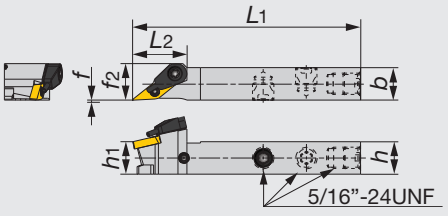
| Designation | Clamping screw | Coolant unit | Wrench |
|---|---|---|---|
| JSWL2XR/L1212F04-CHP | SR34-514 | S-CU-CHP | T-7F |

## JSVJ2XR/L-CHP

Screw-on toolholder without offset with 93° approach angle, for VXGU inserts, with coolant nozle for high pressure




Cutting edge style **J2**




Without offset

Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | f2 | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| JSVJ2XR/L1212F09-CHP | 12 | 12 | 85 | 20 | 12 | 0 | 13.5 | 0.2 | VXGU09T2**L/R... | 0.9 |

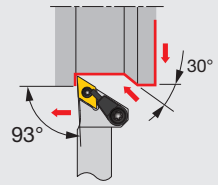
*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: Right-hand toolholders (R) are used with left-hand inserts (L). Left-hand toolholders (L) are used with right-hand inserts (R).

**SPARE PARTS**

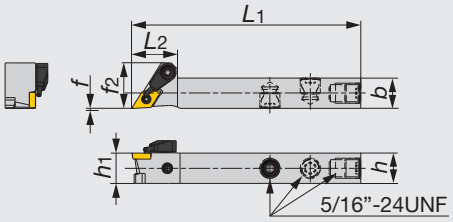
| Designation | Clamping screw | Coolant unit | Wrench |
|---|---|---|---|
| JSVJ2XR/L1212F09-CHP | SR34-508 | S-CU-CHP | T-7F |

## JSDJ2CR/L-CHP

Screw-on toolholder without offset with 93° approach angle, for positive 55° rhombic inserts, with channels for high pressure coolant




Cutting edge style **J2**




Without offset

Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | f2 | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| JSDJ2CR/L1212F07-CHP | 12 | 12 | 85 | 18 | 12 | 0 | 18 | 0.2 | DC**0702... | 0.9 |
| JSDJ2CR/L1212F11-CHP | 12 | 12 | 85 | 19 | 12 | 0 | 20.5 | 0.2 | DC**11T3... | 0.9 |

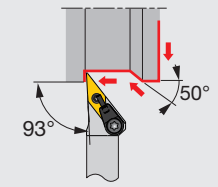
*Torque: Recommended torque (N·m) for clamping
**rε: Standard corner radius

### SPARE PARTS

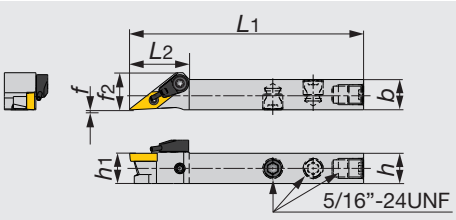
| Designation | Clamping screw | Coolant unit | Wrench |
|---|---|---|---|
| JSDJ2CR/L1212F07-CHP | CSTB-2.5 | S-CU-CHP | T-8F |
| JSDJ2CR/L1212F11-CHP | CSTB-4SD | S-CU-CHP | T-8F |

## JSVJ2BR/L-CHP

Screw-on toolholder without offset with 93° approach angle, for positive 35° rhombic inserts, with channels for high pressure coolant




Cutting edge style **J2**




Without offset

Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | f2 | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| JSVJ2BR/L1212F11-CHP | 12 | 12 | 85 | 23.6 | 12 | 0 | 14.7 | 0.2 | VB**1103... | 1.2 |

*Torque: Recommended torque (N·m) for clamping
**rε: Standard corner radius

### SPARE PARTS

| Designation | Clamping screw | Coolant unit | Wrench |
|---|---|---|---|
| JSVJ2BR/L1212F11-CHP | CSTB-2.5 | S-CU-CHP | T-8F |

JSDJ2XR/L-CHP: Inserts → **B150 -**

JSWL2XR/L-CHP: Inserts → **B149**

JSVJ2XR/L-CHP: Inserts → **B151**

JSDJ2CR/L-CHP: Inserts → **B114 -**, CBN → **B168 -**, PCD → **B177**

JSVJ2BR/L-CHP: Inserts → **B142 -**, CBN → **B169 -**

## Connecting hose

Fig. 1

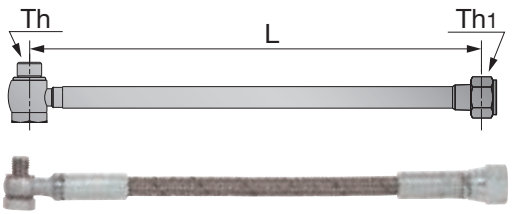
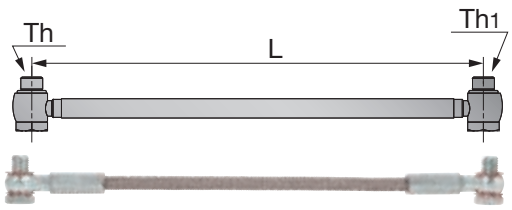
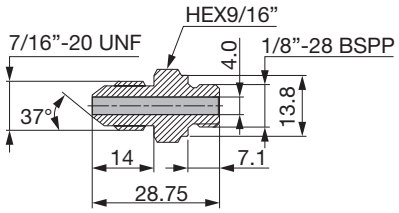


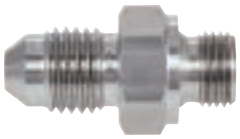

Fig. 2




| Designation | L | Th | Th1 | Max. pressure (Mpa) | Fig. |
|---|---|---|---|---|---|
| CHP-HOSE-G1/8-7/16-200BS | 200 | G1/8"-28 BSPP | 7/16"-20 UNF | 26 | 1 |
| CHP-HOSE-G1/8-7/16-250BS | 250 | G1/8"-28 BSPP | 7/16"-20 UNF | 26 | 1 |
| CHP-HOSE-5/16-7/16-200BS | 200 | 5/16"-24UNF | 7/16"-20 UNF | 20 | 1 |
| CHP-HOSE-5/16-G1/8-200BS | 200 | 5/16"-24UNF | G1/8"-28 BSPP | 20 | 1 |
| CHP-HOSE-G1/8-G1/8-200BB | 200 | G1/8"-28 BSPP | G1/8"-28 BSPP | 26 | 2 |
| CHP-HOSE-G1/8-G1/8-250BB | 250 | G1/8"-28 BSPP | G1/8"-28 BSPP | 26 | 2 |

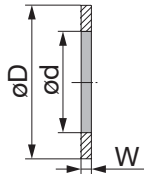
## Connector



| Designation |
|---|
| CHP-NIPPLE-G1/8-7/16UNF |

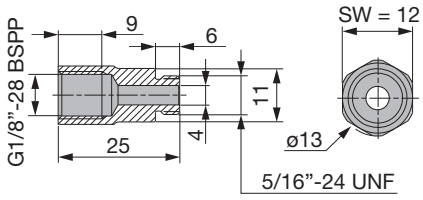
## Seal washer






| Designation | øD | ød | W |
|---|---|---|---|
| CHP-COPPER-SEAL1/8 | 15 | 10 | 1 |
| CHP-COPPER-SEAL5/16 | 11 | 8 | 1 |
| CHP-COPPER-SEAL5/16-2.5 | 11 | 8 | 2.5 |

## Connector for small lathe with seal washer

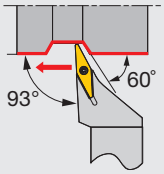




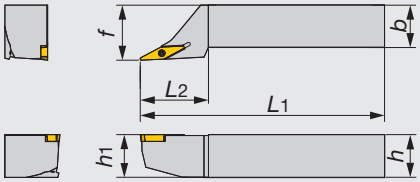

| Designation |
|---|
| CHP-CONECTOR/5/16-G1/8 |

## SYJBR/L

Screw-on clamp toolholder with 93° approach angle, for positive 25° rhombic inserts




Cutting edge style **J**




Right hand (R) shown.

| Designation | *h* | *b* | $L_1$ | $L_2$ | $h_1$ | *f* | $r_\varepsilon$** | Insert |
|---|---|---|---|---|---|---|---|---|
| SYJBR/L2020K16 | 20 | 20 | 125 | 35 | 20 | 25 | 0.8 | YWMT16T3... |
| SYJBR/L2525M16 | 25 | 25 | 150 | 40 | 25 | 32 | 0.8 | YWMT16T3... |

**$r_\varepsilon$: Standard corner radius

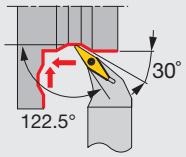
**SPARE PARTS**

| Designation | Clamping screw | Wrench |
|---|---|---|
| SYJBR/L... | CSTB-2.5L080 | T-8F |

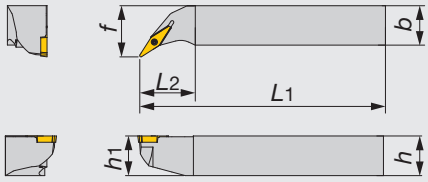


## SYQBR/L

Screw-on clamp toolholder with 122.5° approach angle, for positive 25° rhombic inserts




Cutting edge style **Q**




Right hand (R) shown.

| Designation | *h* | *b* | $L_1$ | $L_2$ | $h_1$ | *f* | $r_\varepsilon$** | Insert |
|---|---|---|---|---|---|---|---|---|
| SYQBR/L2020K16 | 20 | 20 | 125 | 35 | 20 | 27 | 0.8 | YWMT16T3... |
| SYQBR/L2525M16 | 25 | 25 | 150 | 35 | 25 | 32 | 0.8 | YWMT16T3... |

**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

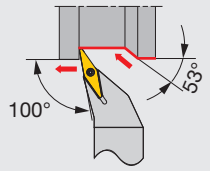
| Designation | Clamping screw | Wrench |
|---|---|---|
| SYQBR/L... | CSTB-2.5L080 | T-8F |

SYJBR/L, SYQBR/L: Inserts → **B148**

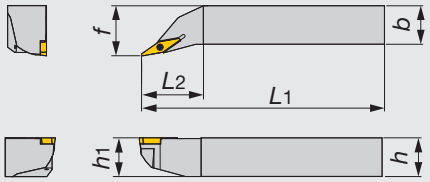
# Y-PRO SERIES

## SYHBR/L

Screw-on clamp toolholder with 100° approach angle, for positive 25° rhombic inserts




Cutting edge style **H**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert |
|---|---|---|---|---|---|---|---|---|
| SYHBR/L2020K16 | 20 | 20 | 125 | 35 | 20 | 27 | 0.8 | YWMT16T3... |
| SYHBR/L2525M16 | 25 | 25 | 150 | 40 | 25 | 32 | 0.8 | YWMT16T3... |

**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

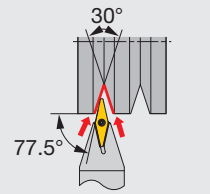



| Designation | Clamping screw | Wrench |
|---|---|---|
| SYHBR/L... | CSTB-2.5L080 | T-8F |

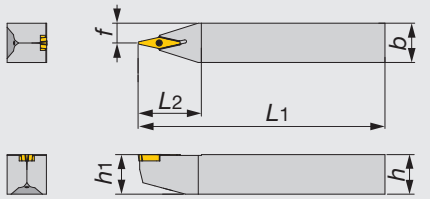
# Y-PRO SERIES

## SYIBN

Screw-on clamp toolholder with 77.5° approach angle, for positive 25° rhombic inserts




Cutting edge style **I**




| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert |
|---|---|---|---|---|---|---|---|---|
| SYIBN2020K16 | 20 | 20 | 125 | 32 | 20 | 10 | 0.8 | YWMT16T3... |
| SYIBN2525M16 | 25 | 25 | 150 | 40 | 25 | 12.5 | 0.8 | YWMT16T3... |

**$r_\varepsilon$: Standard corner radius

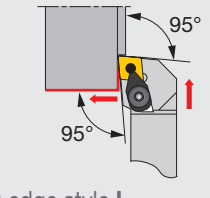
**SPARE PARTS**



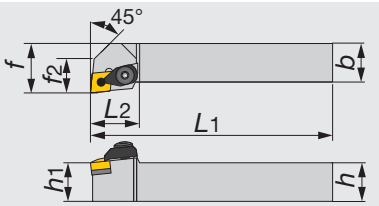

| Designation | Clamping screw | Wrench |
|---|---|---|
| SYIBN... | CSTB-2.5L080 | T-8F |

## DCLNR/L

"One-Double" toolholder with 95° approach angle, for negative 80° rhombic inserts




Cutting edge style **L**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *f*2 | *r*ε** | Insert |
|---|---|---|---|---|---|---|---|---|---|
| DCLNR/L2020K12 | 20 | 20 | 125 | 30 | 20 | 25 | 18 | 0.8 | CN**1204... |
| DCLNR/L2525M12 | 25 | 25 | 150 | 30 | 25 | 32 | 18 | 0.8 | CN**1204... |
| DCLNR/L3225P12 | 32 | 25 | 170 | 30 | 32 | 32 | 18 | 0.8 | CN**1204... |

Note: Except for 57-type chipbreaker inserts
**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**







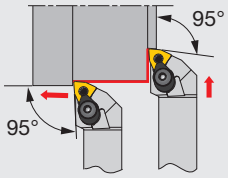




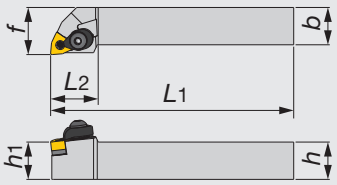
| Designation | Clamp | Lever | Piston | Clamp screw | Shim | Spring | Spring pin | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|---|---|---|
| DCLNR/L... | DCPM-43 | DLCL43 | DPIS43 | DLCS43 | LSC42 | BP-10 | LSP4 | P-3 | P-4 |

## DWLNR/L

"One-Double" toolholder with 95° approach angle, for negative trigon inserts




Cutting edge style **L**




Right hand (R) shown.

| Designation | *h* | *b* | $L_1$ | $L_2$ | $h_1$ | *f* | $r_\varepsilon$** | Insert |
|---|---|---|---|---|---|---|---|---|
| DWLNR/L2020K06 | 20 | 20 | 125 | 25.5 | 20 | 25 | 0.8 | WN**0604... |
| DWLNR/L2020K08 | 20 | 20 | 125 | 31 | 20 | 25 | 0.8 | WN**0804... |
| DWLNR/L2525M06 | 25 | 25 | 150 | 26 | 25 | 32 | 0.8 | WN**0604... |
| DWLNR/L2525M08 | 25 | 25 | 150 | 31 | 25 | 32 | 0.8 | WN**0804... |
| DWLNR/L3225P08 | 32 | 25 | 170 | 30 | 32 | 32 | 0.8 | WN**0804... |

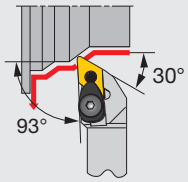
Note: Except for 57-type chipbreaker inserts
**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

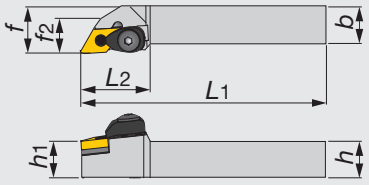
| Designation | Clamp | Lever | Piston | Clamp screw | Shim | Spring | Spring pin | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|---|---|---|
| DWLNR/L**06 | DCPM-33 | LCL33 | DPIS33 | DLCS33 | LSW312 | BP-9 | LSP3 | P-2.5 | P-3 |
| DWLNR/L**08 | DCPM-43 | DLCL43 | DPIS43 | DLCS43 | LSW42 | BP-10 | LSP4 | P-3 | P-4 |

## DDJNR/L

"One-Double" toolholder with 93° approach angle, for negative 55° rhombic inserts




Cutting edge style **J**




Right hand (R) shown.

| Designation | *h* | *b* | $L_1$ | $L_2$ | $h_1$ | *f* | $f_2$ | $r_\varepsilon$** | Insert |
|---|---|---|---|---|---|---|---|---|---|
| DDJNR/L2020K15 | 20 | 20 | 125 | 38 | 20 | 25 | 19 | 0.8 | DN**1504... |
| DDJNR/L2020K1506 | 20 | 20 | 125 | 38 | 20 | 25 | 19 | 0.8 | DN**1506... |
| DDJNR/L2525M15 | 25 | 25 | 150 | 38 | 25 | 32 | 19 | 0.8 | DN**1504... |
| DDJNR/L2525M1506 | 25 | 25 | 150 | 38 | 25 | 32 | 19 | 0.8 | DN**1506... |
| DDJNR/L3225P15 | 32 | 25 | 170 | 38 | 32 | 32 | 19 | 0.8 | DN**1504... |
| DDJNR/L3225P1506 | 32 | 25 | 170 | 38 | 32 | 32 | 19 | 0.8 | DN**1506... |

Note: Except for 57-type chipbreaker inserts
**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

| Designation | Clamp | Lever | Piston | Clamp screw | Shim | Spring | Spring pin | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|---|---|---|
| DDJNR/L**15 | DCPM-43 | DLCL43 | DPIS43 | DLCS43 | LSD42 | BP-10 | LSP4 | P-3 | P-4 |
| DDJNR/L**1506 | DCPM-43 | DLCL43 | DPIS44 | DLCS43 | LSD42 | BP-10 | LSP4 | P-3 | P-4 |


SYHBR/L, SYIBN: Inserts → **B148**

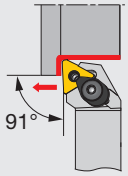
DCLNR/L: Inserts → **B050 -**, CBN → **B163 -**, PCD → **B176**

DWLNR/L: Inserts → **B090 -**, CBN → **B165**

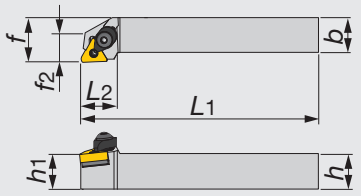
DDJNR/L: Inserts → **B061 -**, CBN → **B163 -**, PCD → **B176**

## DTGNR/L

"One-Double" toolholder with 91° approach angle, for negative triangle inserts




Cutting edge style **G**




Right hand (R) shown.

| Designation | *h* | *b* | $L_1$ | $L_2$ | $h_1$ | *f* | $f_2$ | $r_\varepsilon$** | Insert |
|---|---|---|---|---|---|---|---|---|---|
| DTGNR/L2020K16 | 20 | 20 | 125 | 21 | 20 | 25 | 16 | 0.8 | TN**1604... |
| DTGNR/L2525M16 | 25 | 25 | 150 | 21 | 25 | 32 | 21 | 0.8 | TN**1604... |
| DTGNR/L2525M22 | 25 | 25 | 150 | 28 | 25 | 32 | 25 | 0.8 | TN**2204... |

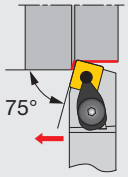
Note: Except for 57-type chipbreaker inserts
**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

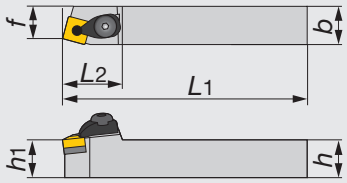
| Designation | Clamp | Lever | Piston | Clamp screw | Shim | Spring | Spring pin | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|---|---|---|
| DTGNR/L**16 | DCPM-33 | LCL33 | DPIS33 | DLCS33 | LST317 | BP-9 | LSP3 | P-2.5 | P-3 |
| DTGNR/L**22 | DCPM-43 | DLCL43 | DPIS43 | DLCS43 | LST42 | BP-10 | LSP4 | P-3 | P-4 |

## DSBNR/L

"One-Double" toolholder with 75° approach angle, for negative square inserts




Cutting edge style **B**




Right hand (R) shown.

| Designation | *h* | *b* | $L_1$ | $L_2$ | $h_1$ | *f* | $r_\varepsilon$** | Insert |
|---|---|---|---|---|---|---|---|---|
| DSBNR/L2020K12 | 20 | 20 | 125 | 35 | 20 | 17 | 0.8 | SN**1204... |
| DSBNR/L2525M12 | 25 | 25 | 150 | 35 | 25 | 22 | 0.8 | SN**1204... |

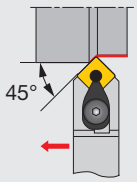
Note: Except for 57-type chipbreaker inserts
**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

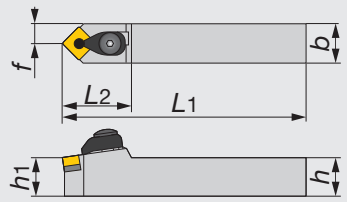
| Designation | Clamp | Lever | Piston | Clamp screw | Shim | Spring | Spring pin | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|---|---|---|
| DSBNR/L... | DCPM-43 | DLCL43 | DPIS43 | DLCS43 | LSS42 | BP-10 | LSP4 | P-3 | P-4 |

## DSDNN

"One-Double" toolholder with 45° approach angle, for negative square inserts




Cutting edge style **D**




| Designation | *h* | *b* | $L_1$ | $L_2$ | $h_1$ | *f* | $r_\varepsilon$** | Insert |
|---|---|---|---|---|---|---|---|---|
| DSDNN2020K12 | 20 | 20 | 125 | 36 | 20 | 10 | 0.8 | SN**1204... |
| DSDNN2525M12 | 25 | 25 | 150 | 36 | 25 | 12.5 | 0.8 | SN**1204... |

Note: Except for 57-type chipbreaker inserts
**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

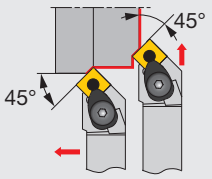
| Designation | Clamp | Lever | Piston | Clamp screw | Shim | Spring | Spring pin | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|---|---|---|
| DSDNN... | DCPM-43 | DLCL43 | DPIS43 | DLCS43 | LSS42 | BP-10 | LSP4 | P-3 | P-4 |

DTGNR/L: Inserts → **B079 -**, CBN → **B164 -**, PCD → **B176**

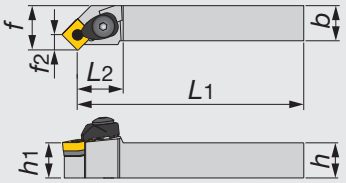
DSBNR/L, DSDNN: Inserts → **B070 -**, CBN → **B164**, PCD → **B176**

## DSSNR/L

"One-Double" toolholder with 45° approach angle (S-style), for negative square inserts




Cutting edge style **S**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *f*2 | *r*ε** | Insert |
|---|---|---|---|---|---|---|---|---|---|
| DSSNR/L2020K12 | 20 | 20 | 125 | 34.3 | 20 | 25 | 8.3 | 0.8 | SN**1204... |
| DSSNR/L2525M12 | 25 | 25 | 150 | 34.3 | 25 | 32 | 8.3 | 0.8 | SN**1204... |

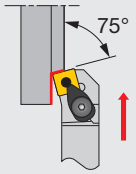
Note: Except for 57-type chipbreaker inserts
**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

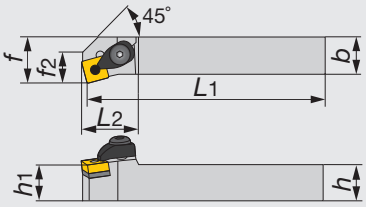
| Designation | Clamp | Lever | Piston | Clamp screw | Shim | Spring | Spring pin | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|---|---|---|
| DSSNR/L... | DCPM-43 | DLCL43 | DPIS43 | DLCS43 | LSS42 | BP-10 | LSP4 | P-3 | P-4 |

## DSKNR/L

"One-Double" toolholder with 75° approach angle, for negative square inserts




Cutting edge style **K**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *f*2 | *r*ε** | Insert |
|---|---|---|---|---|---|---|---|---|---|
| DSKNR/L2020K12 | 20 | 20 | 125 | 31 | 20 | 25 | 17 | 0.8 | SN**1204... |
| DSKNR/L2525M12 | 25 | 25 | 150 | 31 | 25 | 32 | 17 | 0.8 | SN**1204... |

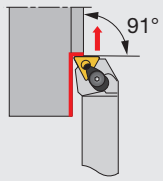
Note: Except for 57-type chipbreaker inserts
**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

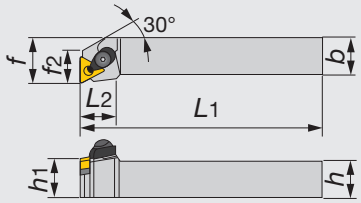
| Designation | Clamp | Lever | Piston | Clamp screw | Shim | Spring | Spring pin | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|---|---|---|
| DSKNR/L... | DCPM-43 | DLCL43 | DPIS43 | DLCS43 | LSS42 | BP-10 | LSP4 | P-3 | P-4 |

## DTFNR/L

"One-Double" toolholder for facing with 91° approach angle, negative triangle inserts




Cutting edge style **F**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *f*2 | *r*ε** | Insert |
|---|---|---|---|---|---|---|---|---|---|
| DTFNR/L2020K16 | 20 | 20 | 125 | 23 | 20 | 25 | 18.5 | 0.8 | TN**1604... |
| DTFNR/L2525M16 | 25 | 25 | 150 | 23 | 25 | 32 | 20 | 0.8 | TN**1604... |
| DTFNR/L2525M22 | 25 | 25 | 150 | 31 | 25 | 32 | 24 | 0.8 | TN**2204... |

Note: Except for 57-type chipbreaker inserts
**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

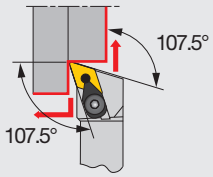
| Designation | Clamp | Lever | Piston | Clamp screw | Shim | Spring | Spring pin | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|---|---|---|
| DTFNR/L**16 | DCPM-33 | LCL33 | DPIS33 | DLCS33 | LST317 | BP-9 | LSP3 | P-2.5 | P-3 |
| DTFNR/L**22 | DCPM-43 | DLCL43 | DPIS43 | DLCS43 | LST42 | BP-10 | LSP4 | P-3 | P-4 |

DSSNR/L, DSKNR/L: Inserts → **B070 -**, CBN → **B164**, PCD → **B176**

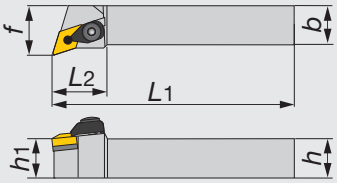
DTFNR/L: Inserts → **B079 -**, CBN → **B164**, PCD → **B176**

## DDQNR/L

"One-Double" toolholder with 107.5° approach angle, for negative 55° rhombic inserts




Cutting edge style **Q**




| Designation | *h* | *b* | $L_1$ | $L_2$ | $h_1$ | *f* | $r_\varepsilon$** | Insert |
|---|---|---|---|---|---|---|---|---|
| DDQNR/L2020K15 | 20 | 20 | 125 | 35 | 20 | 25 | 0.8 | DN**1504... |
| DDQNR/L2020K1506 | 20 | 20 | 125 | 35 | 20 | 25 | 0.8 | DN**1506... |
| DDQNR/L2525M15 | 25 | 25 | 150 | 35 | 25 | 32 | 0.8 | DN**1504... |
| DDQNR/L2525M1506 | 25 | 25 | 150 | 35 | 25 | 32 | 0.8 | DN**1506... |
| DDQNR/L3225P15 | 32 | 25 | 170 | 35 | 32 | 32 | 0.8 | DN**1504... |
| DDQNR/L3225P1506 | 32 | 25 | 170 | 35 | 32 | 32 | 0.8 | DN**1506... |

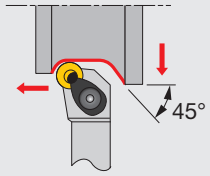
Note: Except for 57-type chipbreaker inserts
**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

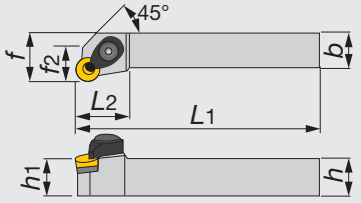
| Designation | Clamp | Lever | Piston | Clamp screw | Shim | Spring | Spring pin | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|---|---|---|
| DDQNR/L**15 | DCPM-43 | DLCL43 | DPIS43 | DLCS43 | LSD42 | BP-10 | LSP4 | P-3 | P-4 |
| DDQNR/L**1506 | DCPM-43 | DLCL43 | DPIS44 | DLCS43 | LSD42 | BP-10 | LSP4 | P-3 | P-4 |

## DRGNR/L

"One-Double" toolholder with 91° approach angle, for negative round inserts




Cutting edge style **G**




Right hand (R) shown.

| Designation | *h* | *b* | $L_1$ | $L_2$ | $h_1$ | *f* | $f_2$ | $r_\varepsilon$** | Insert |
|---|---|---|---|---|---|---|---|---|---|
| DRGNR/L2525M12 | 25 | 25 | 150 | 28 | 25 | 32 | 18 | 6.35 | RN**120400 |

**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

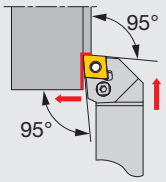
| Designation | Clamp | Lever | Piston | Clamp screw | Shim | Spring | Spring pin | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|---|---|---|
| DRGNR/L... | DCPM-43 | DLCL43 | DPIS43 | DLCS43 | LSR42 | BP-10 | LSP4 | P-3 | P-4 |

DDQNR/L: Inserts → **B061 -**, CBN → **B163 -**, PCD → **B176**

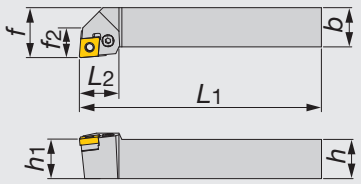
DRGNR/L: Inserts → **B102 -**

## PCLNR/L

Lever lock type toolholder with 95° approach angle, for negative 80° rhombic inserts




Cutting edge style **L**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *f*2 | *r*ε** | Insert |
|---|---|---|---|---|---|---|---|---|---|
| PCLNR/L1616H09 | 16 | 16 | 100 | 20 | 16 | 20 | 15 | 0.8 | CN**0903... |
| PCLNR/L2020K09 | 20 | 20 | 125 | 20 | 20 | 25 | 15 | 0.8 | CN**0903... |
| PCLNR/L2525M09 | 25 | 25 | 150 | 20 | 25 | 32 | 15 | 0.8 | CN**0903... |
| PCLNR/L1616 | 16 | 16 | 100 | 26 | 16 | 20 | – | 0.8 | CN**1204... |
| PCLNR/L2020 | 20 | 20 | 125 | 28 | 20 | 25 | 18 | 0.8 | CN**1204... |
| PCLNR/L2525M4 | 25 | 25 | 150 | 28 | 25 | 32 | 18 | 0.8 | CN**1204... |
| PCLNR/L3225P4 | 32 | 25 | 170 | 28 | 32 | 32 | 18 | 0.8 | CN**1204... |
| PCLNR/L3232 | 32 | 32 | 170 | 40 | 32 | 40 | 25 | 1.2 | CN**1906... |
| PCLNR/L1616H12E | 16 | 16 | 100 | 26 | 16 | 20 | – | 0.8 | CN**1204... |
| PCLNR/L2020K12E | 20 | 20 | 125 | 28 | 20 | 25 | 18 | 0.8 | CN**1204... |
| PCLNR/L2525M12E | 25 | 25 | 150 | 28 | 25 | 32 | 18 | 0.8 | CN**1204... |
| PCLNR/L3225P12E | 32 | 25 | 170 | 28 | 32 | 32 | 18 | 0.8 | CN**1204... |
| PCLNR/L2525M16E | 25 | 25 | 150 | 31 | 25 | 25 | – | 1.2 | CN**1606... |
| PCLNR/L3225P16E | 32 | 25 | 150 | 31 | 32 | 32 | – | 1.2 | CN**1606... |
| PCLNR3232P16E | 32 | 32 | 170 | 31 | 32 | 40 | – | 1.2 | CN**1606... |
| PCLNR/L3232P19E | 32 | 32 | 170 | 40 | 32 | 40 | 25 | 1.2 | CN**1906... |

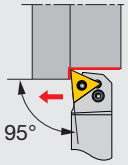
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

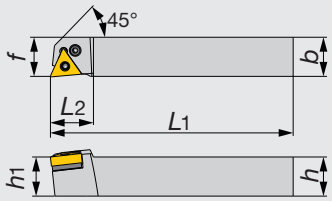
| Designation | Shim | Clamping screw | Wrench | Spring pin | Lever |
|---|---|---|---|---|---|
| PCLNR/L1616H09 | ELSC32 | LCS3 | P-2.5 | LSP3L | LCL33 |
| PCLNR/L2020K09 | ELSC32 | LCS3 | P-2.5 | LSP3L | LCL33 |
| PCLNR/L2525M09 | ELSC32 | LCS3 | P-2.5 | LSP3L | LCL33 |
| PCLNR/L1616 | LSC42 | LCS4CA | P-3 | LSP4 | LCL4 |
| PCLNR/L2020 | LSC42 | LCS4 | P-3 | LSP4 | LCL4 |
| PCLNR/L2525M4 | LSC42 | LCS4 | P-3 | LSP4 | LCL4 |
| PCLNR/L3225P4 | LSC42 | LCS4 | P-3 | LSP4 | LCL4 |
| PCLNR/L3232 | LSC63 | LCS6 | P-4 | LSP6 | LCL6 |
| PCLNR/L1616H12E | ELSC42 | LCS4CA | P-3 | LSP4 | LCL4 |
| PCLNR/L2020K12E | ELSC42 | LCS4 | P-3 | LSP4S | LCL43M |
| PCLNR/L2525M12E | ELSC42 | LCS4 | P-3 | LSP4S | LCL43M |
| PCLNR/L3225P12E | ELSC42 | LCS4 | P-3 | LSP4S | LCL43M |
| PCLNR/L2525M16E | ELSC53 | LCS5 | P-3 | LSP6C | LCL5 |
| PCLNR/L3225P16E | ELSC53 | LCS5 | P-3 | LSP6C | LCL5 |
| PCLNR/L3232P16E | ELSC53 | LCS5 | P-3 | LSP6C | LCL5 |
| PCLNR/L3232P19E | ELSC63 | LCS6 | P-4 | LSP6 | LCL6 |

## PTL2NR/L

No-offset Lever-lock clamp toolholder with 95° approach approach angle, for negative 60° triangular inserts




Cutting edge style **L2**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| PTL2NR/L2020H16 | 20 | 20 | 100 | 22 | 20 | 20 | 0.4 | TN**1604... | 2 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

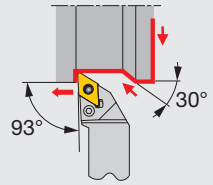
| Designation | Shim | Clamping screw | Wrench | Spring pin | Lever |
|---|---|---|---|---|---|
| PTL2NR/L... | LST317 D30 | LCS3 | P-2.5 | LSP3 | LCL3 |

PCLNR/L: Inserts → **B050 -**, CBN → **B163 -**, PCD → **B176 -**

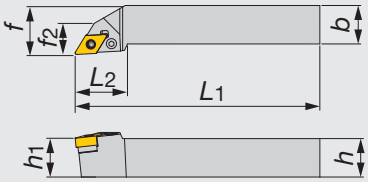
PTL2NR/L: Inserts → **B079 -**, CBN → **B164**, PCD → **B176**

## PDJNR/L

Lever lock type toolholder with 93° approach angle, for negative 55° rhombic inserts




Cutting edge style **J**




Right hand (R) shown.

| Designation | *h* | *b* | $L_1$ | $L_2$ | $h_1$ | *f* | $f_2$ | $r_\varepsilon$** | Insert |
|---|---|---|---|---|---|---|---|---|---|
| PDJNR/L1616H11 | 16 | 16 | 100 | 27 | 16 | 20 | 16 | 0.8 | DN**1104... |
| PDJNR/L2020K11 | 20 | 20 | 125 | 27 | 20 | 25 | 16 | 0.8 | DN**1104... |
| PDJNR/L2020 | 20 | 20 | 125 | 34 | 20 | 25 | 19 | 0.8 | DN**1504... |
| PDJNR2020K15E | 20 | 20 | 125 | 36 | 20 | 25 | - | 0.8 | DN**1506... |
| PDJNR/L2520 | 25 | 20 | 150 | 34 | 25 | 25 | 19 | 0.8 | DN**1504... |
| PDJNR/L2525M11 | 25 | 25 | 150 | 27 | 25 | 32 | 19 | 0.8 | DN**1104... |
| PDJNR/L2525 | 25 | 25 | 150 | 34 | 25 | 32 | 19 | 0.8 | DN**1504... |
| PDJNR/L2525M15E | 25 | 25 | 150 | 36 | 25 | 32 | - | 0.8 | DN**1506... |
| PDJNR/L3225 | 32 | 25 | 170 | 32 | 32 | 32 | 19 | 0.8 | DN**1504... |
| PDJNR3225P15E | 32 | 25 | 170 | 36 | 32 | 34 | - | 0.8 | DN**1506... |

**$r_\varepsilon$: Standard corner radius

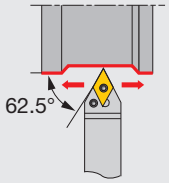
### SPARE PARTS

| Designation | Shim | Clamping screw | Wrench | Spring pin | Lever |
|---|---|---|---|---|---|
| PDJNR/L1616H11, 2020K11 | ELSD32 | LCS3 | P-2.5 | LSP3 | LCL33L |
| PDJNR/L2020 | LSD42 | LCS4 | P-3 | LSP4 | LCL4 |
| PDJNR2020K15E | ELSD42 | ELCS4 | P-3 | LSP4S | LCL44 |
| PDJNR/L2520 | LSD42 | LCS4 | P-3 | LSP4 | LCL4 |
| PDJNR/L2525 | LSD42 | LCS4 | P-3 | LSP4 | LCL4 |
| PDJNR/L2525M15E | ELSD42 | ELCS4 | P-3 | LSP4S | LCL44 |
| PDJNR/L3225 | LSD42 | LCS4 | P-3 | LSP4 | LCL4 |
| PDJNR3225P15E | ELSD42 | ELCS4 | P-3 | LSP4S | LCL44 |

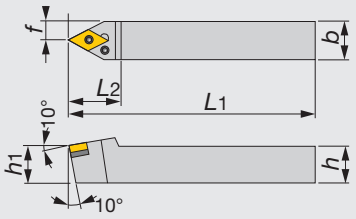
PDJNR/L: Inserts → **B061 -**, CBN → **B163 -**, PCD → **B176**

## PDPNN

Lever lock type toolholder with 62.5° approach angle, for negative 55° rhombic inserts




Cutting edge style **P**




| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert |
|---|---|---|---|---|---|---|---|---|
| PDPNN2525 | 25 | 25 | 150 | 36 | 25 | 12.5 | 0.8 | DN**1504... |
| PDPNN2525M15E | 25 | 25 | 150 | 36 | 25 | 12.5 | 0.8 | DN**1506... |

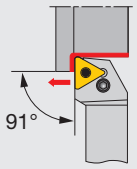
**r*ε: Standard corner radius

### SPARE PARTS

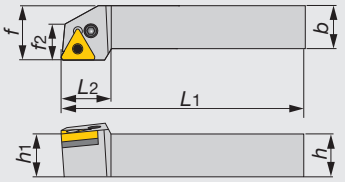
| Designation | Shim | Clamping screw | Wrench | Spring pin | Lever |
|---|---|---|---|---|---|
| PDPNN2525 | LSD42 | LCS4 | P-3 | LSP4 | LCL4 |
| PDPNN2525M15E | ELSD42 | ELCS4 | P-3 | LSP4S | LCL44 |

## PTGNR/L

Lever lock type toolholder with 91° approach angle, for negative triangle inserts




Cutting edge style **G**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *f*2 | *r*ε** | Insert |
|---|---|---|---|---|---|---|---|---|---|
| PTGNR/L1616 | 16 | 16 | 100 | 22 | 16 | 20 | 16 | 0.8 | TN**1604... |
| PTGNR/L2020 | 20 | 20 | 125 | 22 | 20 | 25 | 16 | 0.8 | TN**1604... |
| PTGNR/L2525M3 | 25 | 25 | 150 | 22 | 25 | 32 | 21 | 0.8 | TN**1604... |
| PTGNR/L2525M4 | 25 | 25 | 150 | 28 | 25 | 32 | 24 | 0.8 | TN**2204... |
| PTGNR3225P4 | 32 | 25 | 170 | 28 | 32 | 32 | 24 | 0.8 | TN**2204... |

**r*ε: Standard corner radius

### SPARE PARTS

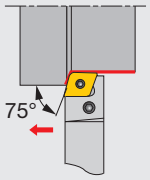
| Designation | Shim | Clamping screw | Wrench | Spring pin | Lever |
|---|---|---|---|---|---|
| PTGNR/L1616, 2020 | LST317 | LCS3 | P-2.5 | LSP3 | LCL3 |
| PTGNR/L2525M3 | LST317 | LCS3 | P-2.5 | LSP3 | LCL3 |
| PTGNR/L2525M4 | LST42 | LCS4 | P-3 | LSP4 | LCL4 |
| PTGNR3225P4 | LST42 | LCS4 | P-3 | LSP4 | LCL4 |

PDPNN: Inserts → **B061 -**, CBN → **B163 -**, PCD → **B176**

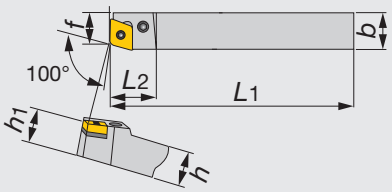
PTGNR/L: Inserts → **B079 -**, CBN → **B164 -**, PCD → **B176**

## PCBNR/L

Lever lock type toolholder with 75° approach angle, for negative 80° rhombic inserts




Cutting edge style **B**




Right hand (R) shown.

| Designation | *h* | *b* | $L_1$ | $L_2$ | $h_1$ | *f* | $r_\varepsilon$** | Insert |
|---|---|---|---|---|---|---|---|---|
| PCBNR/L2525 | 25 | 25 | 150 | 28 | 25 | 22 | 0.8 | CN**1204... |

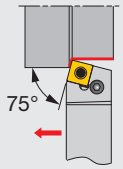
Note: 100° corners are used
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

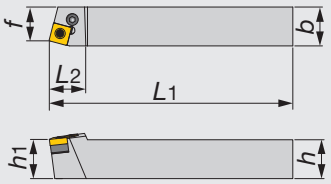
| Designation | Shim | Clamping screw | Wrench | Spring pin | Lever |
|---|---|---|---|---|---|
| PCBNR/L2525 | LSC42 | LCS4 | P-3 | LSP4 | LCL4 |

## PSBNR/L

Lever lock type toolholder with 75° approach angle, for negative square inserts




Cutting edge style **B**




Right hand (R) shown.

| Designation | *h* | *b* | $L_1$ | $L_2$ | $h_1$ | *f* | $r_\varepsilon$** | Insert |
|---|---|---|---|---|---|---|---|---|
| PSBNR/L1616 | 16 | 16 | 100 | 22 | 16 | 13 | 0.8 | SN**0903... |
| PSBNR/L2020 | 20 | 20 | 125 | 28 | 20 | 17 | 0.8 | SN**1204... |
| PSBNR/L2525 | 25 | 25 | 150 | 24 | 25 | 22 | 0.8 | SN**1204... |
| PSBNR/L3232 | 32 | 32 | 170 | 40 | 32 | 27 | 1.2 | SN**1906... |

**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

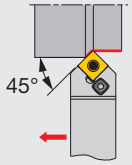
| Designation | Shim | Clamping screw | Wrench | Spring pin | Lever |
|---|---|---|---|---|---|
| PSBNR/L1616 | LSS33 | LCS3 | P-2.5 | LSP3L | LCL3 |
| PSBNR/L2*2* | LSS42 | LCS4 | P-3 | LSP4 | LCL4 |
| PSBNR/L3232 | LSS63 | LCS6 | P-4 | LSP6 | LCL6 |

PCBNR/L: Inserts → **B050 -**, CBN → **B163 -**, PCD → **B176**

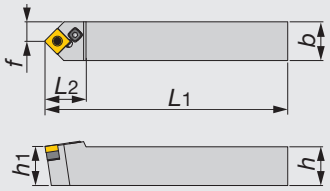
PSBNR/L: Inserts → **B070 -**, CBN → **B164**, PCD → **B176**

## PSDNN

Lever lock type toolholder with 45° approach angle, for negative square inserts




Cutting edge style **D**




| Designation | h | b | L1 | L2 | h1 | f | rε** | Insert |
|---|---|---|---|---|---|---|---|---|
| PSDNN1616 | 16 | 16 | 100 | 22 | 16 | 8 | 0.8 | SN**0903... |
| PSDNN2020 | 20 | 20 | 125 | 30 | 20 | 10.3 | 0.8 | SN**1204... |
| PSDNN2525 | 25 | 25 | 150 | 30 | 25 | 12.8 | 0.8 | SN**1204... |

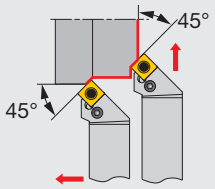
**rε: Standard corner radius

### SPARE PARTS

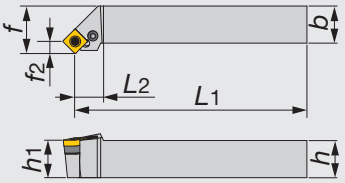
| Designation | Shim | Clamping screw | Wrench | Spring pin | Lever |
|---|---|---|---|---|---|
| PSDNN1616 | LSS33 | LCS3 | P-2.5 | LSP3L | LCL3 |
| PSDNN2020 | LSS42 | LCS4 | P-3 | LSP4 | LCL4 |
| PSDNN2525 | LSS42 | LCS4 | P-3 | LSP4 | LCL4 |

## PSSNR/L

Lever lock type toolholder with 45° approach angle (S-style), for negative square inserts




Cutting edge style **S**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | f2 | rε** | Insert |
|---|---|---|---|---|---|---|---|---|---|
| PSSNR/L1616 | 16 | 16 | 94 | 16 | 16 | 20 | 6.1 | 0.8 | SN**0903... |
| PSSNR/L2020 | 20 | 20 | 116 | 21 | 20 | 25 | 8.3 | 0.8 | SN**1204... |
| PSSNR/L2525 | 25 | 25 | 141 | 21 | 25 | 32 | 8.3 | 0.8 | SN**1204... |
| PSSNR3225 | 32 | 25 | 161 | 21 | 32 | 32 | 8.3 | 0.8 | SN**1204... |
| PSSNR/L3232 | 32 | 32 | 157.5 | 27.5 | 32 | 40 | 12.5 | 1.2 | SN**1906... |

**rε: Standard corner radius

### SPARE PARTS

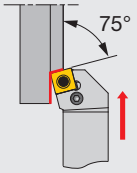
| Designation | Shim | Clamping screw | Wrench | Spring pin | Lever |
|---|---|---|---|---|---|
| PSSNR/L1616 | LSS33 | LCS3 | P-2.5 | LSP3L | LCL3 |
| PSSNR/L2020 | LSS42 | LCS4 | P-3 | LSP4 | LCL4 |
| PSSNR/L**25 | LSS42 | LCS4 | P-3 | LSP4 | LCL4 |
| PSSNR/L3232 | LSS63 | LCS6 | P-4 | LSP6 | LCL6 |



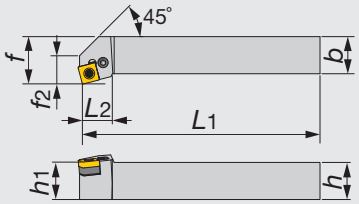
PSDNN, PSSNR/L: Inserts → **B070 -**, CBN → **B164 -**, PCD → **B176 -**

## PSKNR/L

Lever lock type toolholder with 75° approach angle, for negative square inserts




Cutting edge style **K**




Right hand (R) shown.

| Designation | *h* | *b* | $L_1$ | $L_2$ | $h_1$ | *f* | $f_2$ | $r_\varepsilon$** | Insert |
|---|---|---|---|---|---|---|---|---|---|
| PSKNR/L1616 | 16 | 16 | 100 | 17 | 16 | 25 | 15 | 0.8 | SN**0903... |
| PSKNR/L2020 | 20 | 20 | 125 | 22 | 20 | 25 | 17 | 0.8 | SN**1204... |
| PSKNR/L2525 | 25 | 25 | 150 | 22 | 25 | 32 | 17 | 0.8 | SN**1204... |
| PSKNR3232 | 32 | 32 | 170 | 40 | 32 | 40 | 27 | 1.2 | SN**1906... |

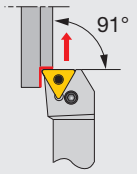
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

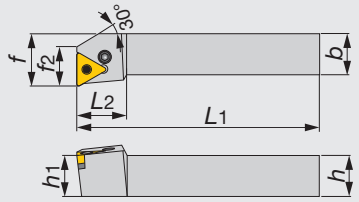
| Designation | Shim | Clamping screw | Wrench | Spring pin | Lever |
|---|---|---|---|---|---|
| PSKNR/L1616 | LSS33 | LCS3 | P-2.5 | LSP3L | LCL3 |
| PSKNR/L2*2* | LSS42 | LCS4 | P-3 | LSP4 | LCL4 |
| PSKNR3232 | LSS63 | LCS6 | P-4 | LSP6 | LCL6 |

## PTFNR/L

Lever lock type toolholder for facing with 91° approach angle, negative triangle inserts




Cutting edge style **F**




Right hand (R) shown.

| Designation | *h* | *b* | $L_1$ | $L_2$ | $h_1$ | *f* | $f_2$ | $r_\varepsilon$** | Insert |
|---|---|---|---|---|---|---|---|---|---|
| PTFNR/L1616 | 16 | 16 | 100 | 22 | 16 | 20 | 16 | 0.8 | TN**1604... |
| PTFNR/L2020 | 20 | 20 | 125 | 22 | 20 | 25 | 16 | 0.8 | TN**1604... |
| PTFNR/L2525M3 | 25 | 25 | 150 | 22 | 25 | 32 | 20 | 0.8 | TN**1604... |
| PTFNR/L2525M4 | 25 | 25 | 150 | 28 | 25 | 32 | 24 | 0.8 | TN**2204... |
| PTFNR/L3225P4 | 32 | 25 | 170 | 28 | 32 | 32 | 24 | 0.8 | TN**2204... |

**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

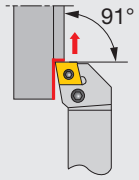
| Designation | Shim | Clamping screw | Wrench | Spring pin | Lever |
|---|---|---|---|---|---|
| PTFNR/L1616, 2020 | LST317 | LCS3 | P-2.5 | LSP3 | LCL3 |
| PTFNR/L2525M3 | LST317 | LCS3 | P-2.5 | LSP3 | LCL3 |
| PTFNR/L**25*4 | LST42 | LCS4 | P-3 | LSP4 | LCL4 |

PSKNR/L: Inserts → **B070 -**, CBN → **B164**, PCD → **B176**

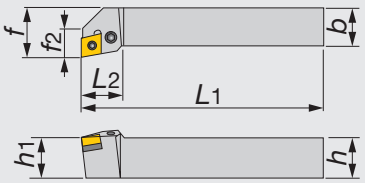
PTFNR/L: Inserts → **B079 -**, CBN → **B164 -**, PCD → **B176**

## PCFNR/L

Lever lock type toolholder for facing with 91° approach angle, negative 80° rhombic inserts




Cutting edge style **F**




Right hand (R) shown.

| Designation | h | b | $L_1$ | $L_2$ | $h_1$ | f | $f_2$ | $r_\varepsilon$** | Insert |
|---|---|---|---|---|---|---|---|---|---|
| PCFNR/L2020 | 20 | 20 | 125 | 28 | 20 | 25 | 18 | 0.8 | CN**1204... |
| PCFNR/L2525 | 25 | 25 | 150 | 28 | 25 | 32 | 18 | 0.8 | CN**1204... |

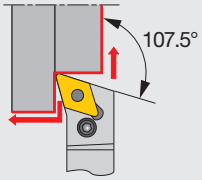
**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

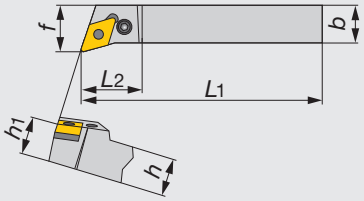
| Designation | Shim | Clamping screw | Wrench | Spring pin | Lever |
|---|---|---|---|---|---|
| PCFNR/L... | LSC42 D30 | LCS4 | P-3 | LSP4 | LCL4 |

## PDQNR/L

Lever lock type toolholder with 107.5° approach angle, for negative 55° rhombic inserts




Cutting edge style **Q**




Right hand (R) shown.

| Designation | h | b | $L_1$ | $L_2$ | $h_1$ | f | $r_\varepsilon$** | Insert |
|---|---|---|---|---|---|---|---|---|
| PDQNR/L2525 | 25 | 25 | 150 | 32 | 25 | 32 | 0.8 | DN**1504... |

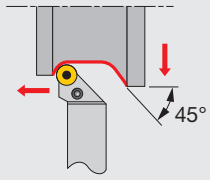
**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

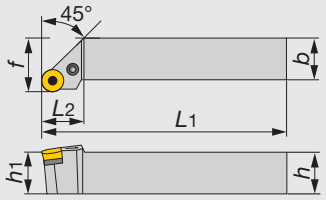
| Designation | Shim | Clamping screw | Wrench | Spring pin | Lever |
|---|---|---|---|---|---|
| PDQNR/L... | LSD42 D30 | LCS4 | P-3 | LSP4 | LCL4 |

## PRGNR/L

Lever lock type toolholder with 91° approach angle, for negative round inserts




Cutting edge style **G**




Right hand (R) shown.

| Designation | h | b | $L_1$ | $L_2$ | $h_1$ | f | $r_\varepsilon$** | Insert |
|---|---|---|---|---|---|---|---|---|
| PRGNR/L2020 | 20 | 20 | 125 | 19 | 20 | 25 | 4.76 | RNMG090300-61 |
| PRGNR/L2525M4 | 25 | 25 | 150 | 25 | 25 | 32 | 6.35 | RN**120400 |

**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

| Designation | Shim | Clamping screw | Wrench | Spring pin | Lever |
|---|---|---|---|---|---|
| PRGNR/L2020 | LSR32 | LCS3 | P-2.5 | LSP3 | LCL3 |
| PRGNR/L2525M4 | LSR42 | LCS4 | P-3 | LSP4 | LCL4 |

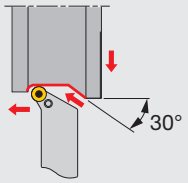
PCFNR/L: Inserts → **B050 -**, CBN → **B163 -**, PCD → **B176 -**

PDQNR/L: Inserts → **B061 -**, CBN → **B163 -**, PCD → **B176**

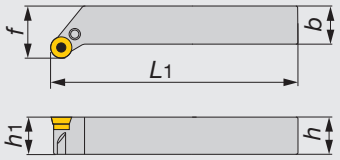
PRGNR/L: Inserts → **B102**

## PRGCR/L

Lever lock type toolholder with 91° approach angle, for positive round inserts




Cutting edge style **G**




Right hand (R) shown.

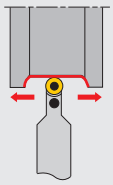
| Designation | *h* | *b* | *L*1 | *h*1 | *f* | Insert |
|---|---|---|---|---|---|---|
| PRGCR/L2020K10 | 20 | 20 | 125 | 20 | 25 | RCMM1003... |
| PRGCR/L2525M12 | 25 | 25 | 150 | 25 | 32 | RCM*1204... |
| PRGCR/L3225P16 | 32 | 25 | 170 | 32 | 32 | RCM*1606... |
| PRGCR/L3232P20 | 32 | 32 | 170 | 32 | 40 | RCM*2006... |

### SPARE PARTS

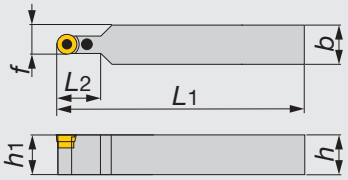
| Designation | Shim | Clamping screw | Wrench | Spring pin | Lever |
|---|---|---|---|---|---|
| PRGCR/L2020K10 | LSR32C | LCS2 | P-2 | LSP3 | LCL3C |
| PRGCR/L2525M12 | LSR42C | LCS3 | P-2.5 | LSP3 | LCL4C |
| PRGCR/L3225P16 | LSR53C | LCS5 | P-3 | LSP4 | LCL5C |
| PRGCR/L3232P20 | LSR63C | LCS5 | P-3 | LSP6C | LCL6C |

## PRDCN

Lever lock type toolholder with 45° approach angle, for positive round inserts



Cutting edge style **D**




| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | Insert |
|---|---|---|---|---|---|---|---|
| PRDCN2020K10 | 20 | 20 | 125 | 22 | 20 | 15 | RCMM1003... |
| PRDCN2525M12 | 25 | 25 | 150 | 24 | 25 | 18.5 | RCM*1204... |
| PRDCN3225P12 | 32 | 25 | 170 | 24 | 32 | 18.5 | RCM*1204... |
| PRDCN3225P16 | 32 | 25 | 170 | 28 | 32 | 20.5 | RCM*1606... |
| PRDCN3232P20 | 32 | 32 | 170 | 32 | 32 | 26 | RCM*2006... |
| PRDCN4040R25 | 40 | 40 | 200 | 42 | 40 | 32.5 | RCM*2507... |

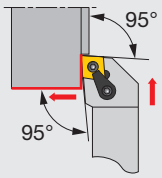
### SPARE PARTS

| Designation | Shim | Clamping screw | Wrench | Spring pin | Lever |
|---|---|---|---|---|---|
| PRDCN2020K10 | LSR32C | LCS2 | P-2 | LSP3 | LCL3C |
| PRDCN**25*12 | LSR42C | LCS3 | P-2.5 | LSP3 | LCL4C |
| PRDCN3225P16 | LSR53C | LCS5 | P-3 | LSP4 | LCL5C |
| PRDCN3232P20 | LSR63C | LCS5 | P-3 | LSP6C | LCL6C |
| PRDCN4040R25 | LSR84C | LCS8C | P-4 | LSP6 | LCL8C |

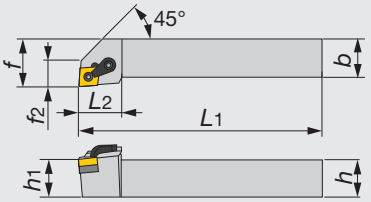
PRGCR/L, PRDCN: Inserts → **B152 -**

## MCLNR/L

Multi-clamp toolholder with 95° approach angle, for negative 80° rhombic inserts




Cutting edge style **L**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *f*2 | *r*ε** | Insert |
|---|---|---|---|---|---|---|---|---|---|
| MCLNR/L2525M12 | 25 | 25 | 150 | 32 | 25 | 32 | 18 | 0.8 | CN**1204... |

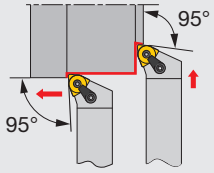
**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

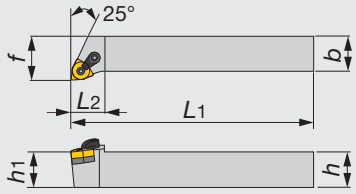
| Designation | Clamp | Pin | Right-left screw | Shim | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|
| MCLNR/L... | MCPM-21 | MLP46 | MCS625-3 | MSC-432 | P-3 | P-2.5F |

## MWLNR/L

Multi-clamp toolholder with 95° approach angle, for negative trigon inserts




Cutting edge style **L**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert |
|---|---|---|---|---|---|---|---|---|
| MWLNR2020K08 | 20 | 20 | 125 | 25 | 20 | 25 | 0.8 | WN**0804... |
| MWLNR/L2525M08 | 25 | 25 | 150. | 25 | 25 | 32 | 0.8 | WN**0804... |

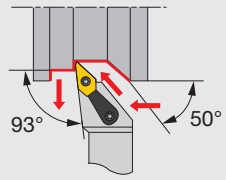
**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

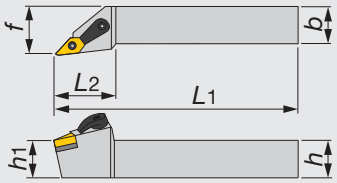
| Designation | Clamp | Pin | Right-left screw | Shim | Wrench |
|---|---|---|---|---|---|
| MWLNR/L... | MCPM-6 | MLP46 | MCS520-2.5 | MSW-432 | P-2.5 |

## MVJNR/L

Multi-clamp toolholder with 93° approach angle, for negative 35° or 25° rhombic inserts




Cutting edge style **J**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert |
|---|---|---|---|---|---|---|---|---|
| MVJNR/L2020K16 | 20 | 20 | 125 | 42 | 20 | 25 | 0.8 | V/YN**1604... |
| MVJNR/L2525M16 | 25 | 25 | 150 | 42 | 25 | 32 | 0.8 | V/YN**1604... |
| MVJNR/L3225P16 | 32 | 25 | 170 | 42 | 32 | 32 | 0.8 | V/YN**1604... |
| MVJNR/L3232P16 | 32 | 32 | 170 | 42 | 32 | 40 | 0.8 | V/YN**1604... |

**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

| Designation | Clamp | Pin | Right-left screw | Shim | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|
| MVJNR/L... | MCPM-22 | MLP34L | MCS625-3 | MSV-322 | P-3 | P-2F |

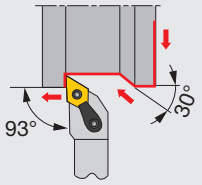
MCLNR/L: Inserts → **B050 -**, CBN → **B163 -**, PCD → **B176**

MWLNR/L: Inserts → **B090 -**, CBN → **B165**

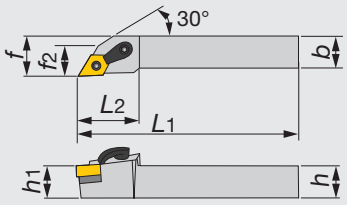
MVJNR/L: Inserts → **B097 -**, CBN → **B165 -**, PCD → **B176**

## MDJNR

Multi-clamp toolholder with 93° approach angle, for negative 55° rhombic inserts




Cutting edge style **J**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *f*2 | *r*ε** | Insert |
|---|---|---|---|---|---|---|---|---|---|
| MDJNR2525M15 | 25 | 25 | 150 | 38 | 25 | 32 | 19 | 0.8 | DN**15... |

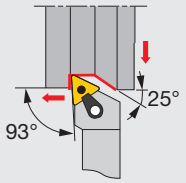
**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

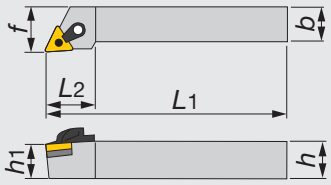
| Designation | Clamp | Pin | Right-left screw | Shim | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|
| MDJNR2525M15 | MCPM-22 | MLP46L | MCS625-3 | MSD-432 | P-3 | P-2.5F |

## MTJNR

Multi-clamp toolholder with 93° approach angle, for negative triangle inserts




Cutting edge style **J**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert |
|---|---|---|---|---|---|---|---|---|
| MTJNR2525M16 | 25 | 25 | 150 | 28 | 25 | 32 | 0.8 | TN**16... |

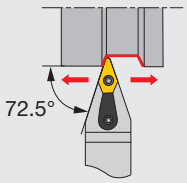
**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

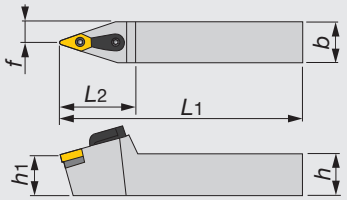
| Designation | Clamp | Pin | Right-left screw | Shim | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|
| MTJNR2525M16 | MCPM-21 | MLP34L | MCS625-3 | MST-322 | P-3 | P-2F |

## MVVNN

Multi-clamp toolholder with 72.5° approach angle, for negative 35° or 25° rhombic inserts




Cutting edge style **V**




| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert |
|---|---|---|---|---|---|---|---|---|
| MVVNN2020K16 | 20 | 20 | 125 | 48 | 20 | 10 | 0.8 | V/YN**1604... |
| MVVNN2525M16 | 25 | 25 | 150 | 48 | 25 | 12.5 | 0.8 | V/YN**1604... |
| MVVNN3225P16 | 32 | 25 | 170 | 48 | 32 | 12.5 | 0.8 | V/YN**1604... |

**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

| Designation | Clamp | Pin | Right-left screw | Shim | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|
| MVVNN... | MCPM-30 | MLP34L | MCS828-4 | MSV-322 | P-4 | P-2F |

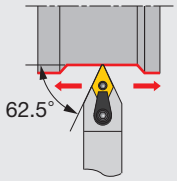
MDJNR: Inserts → **B061 -**, CBN → **B163 -**, PCD → **B176**

MTJNR: Inserts → **B079 -**, CBN → **B164 -**, PCD → **B176**

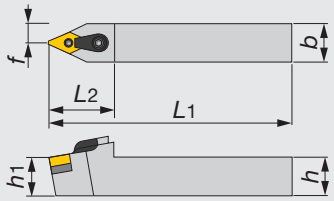
MVVNN: Inserts → **B097 -**, CBN → **B165 -**, PCD → **B176**

## MDPNN

Multi-clamp toolholder with 62.5° approach angle, for negative 55° rhombic inserts




Cutting edge style **P**




| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert |
|---|---|---|---|---|---|---|---|---|
| MDPNN2525M15 | 25 | 25 | 150 | 42 | 25 | 12.5 | 0.8 | DN**15... |

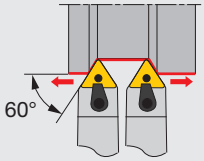
**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

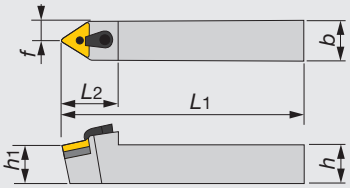
| Designation | Clamp | Pin | Right-left screw | Shim | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|
| MDPNN2525M15 | MCPM-22 | MLP46L | MCS625-3 | MSD-432 | P-3 | P-2.5F |

## MTENN

Multi-clamp toolholder with 60° approach angle, for negative triangle inserts




Cutting edge style **E**




| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert |
|---|---|---|---|---|---|---|---|---|
| MTENN2525M16 | 25 | 25 | 150 | 35 | 25 | 12.5 | 0.8 | TN**16... |

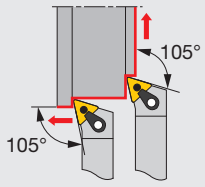
**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

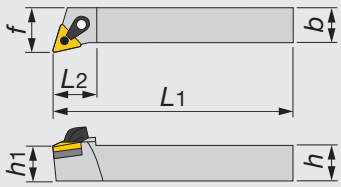
| Designation | Clamp | Pin | Right-left screw | Shim | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|
| MTENN2525M16 | MCPM-21 | MLP34L | MCS625-3 | MST-322 | P-3 | P-2F |

## MTQNR

Multi-clamp toolholder with 105° approach angle, for negative triangle inserts




Cutting edge style **Q**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert |
|---|---|---|---|---|---|---|---|---|
| MTQNR2020K16 | 20 | 20 | 125 | 26 | 20 | 25 | 0.8 | TN**16... |
| MTQNR2525M16 | 25 | 25 | 150 | 26 | 25 | 32 | 0.8 | TN**16... |

**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

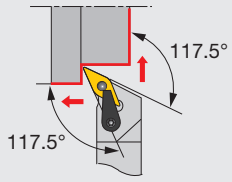
| Designation | Clamp | Pin | Right-left screw | Shim | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|
| MTQNR... | MCPM-21 | MLP34L | MCS625-3 | MST-322 | P-3 | P-2F |

MDPNN: Inserts → **B061 -**, CBN → **B163 -**, PCD → **B176**

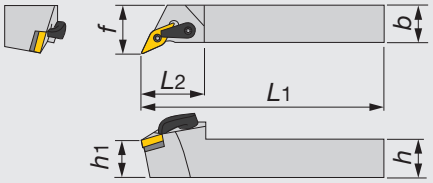
MTENN, MTQNR: Inserts → **B079 -**, CBN → **B164 -**, PCD → **B176**

## MVQNR/L

Multi-clamp toolholder with 117.5° approach angle, for negative 35° or 25° rhombic inserts




Cutting edge style **Q**




Right hand (R) shown.

| Designation | *h* | *b* | $L_1$ | $L_2$ | $h_1$ | *f* | $r_\varepsilon$** | Insert |
|---|---|---|---|---|---|---|---|---|
| MVQNR/L2020K16 | 20 | 20 | 125 | 40 | 20 | 25 | 0.8 | V/YN**1604... |
| MVQNR/L2525M16 | 25 | 25 | 150 | 40 | 25 | 32 | 0.8 | V/YN**1604... |
| MVQNR/L3232P16 | 32 | 32 | 170 | 40 | 32 | 40 | 0.8 | V/YN**1604... |

**$r_\varepsilon$: Standard corner radius

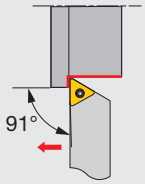
### SPARE PARTS

| Designation | Clamp | Pin | Right-left screw | Shim | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|
| MVQNR/L... | MCPM-22 | MLP34L | MCS625-3 | MSV-322 | P-3 | P-2F |

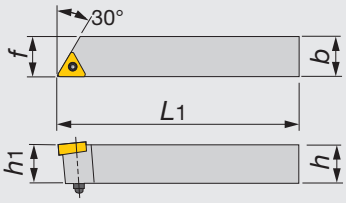
MVQNR/L: Inserts → **B097 -**, CBN → **B165 -**, PCD → **B176**

## ETANR

Pin-lock toolholder with 91° approach angle, for negative triangle inserts




Cutting edge style **A**




Right hand (R) shown.

| Designation | h | b | L1 | h1 | f | rε** | Insert |
|---|---|---|---|---|---|---|---|
| ETANR1616H33 | 16 | 16 | 100 | 15.5 | 16 | 0.8 | TN**1604... |
| ETANR2020K33 | 20 | 20 | 125 | 19.5 | 20 | 0.8 | TN**1604... |

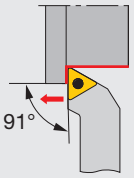
**rε: Standard corner radius

### SPARE PARTS

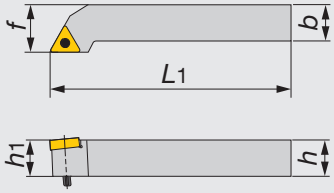
| Designation | E-ring | Pin | Wrench |
|---|---|---|---|
| ETANR1616H33 | ER3 | P332US | KY40 |
| ETANR2020K33 | ER3 | P333US | KY40 |

## ETGNR/L

Pin-lock toolholder with 91° approach angle, for negative triangle inserts




Cutting edge style **G**




Right hand (R) shown.

| Designation | h | b | L1 | h1 | f | rε** | Insert |
|---|---|---|---|---|---|---|---|
| ETGNR/L1212 | 12 | 12 | 80 | 11.5 | 16 | 0.4 | TN**1103... |
| ETGNR/L1616H33 | 16 | 16 | 100 | 15.5 | 20 | 0.8 | TN**1604... |
| ETGNR/L2020K33 | 20 | 20 | 125 | 19.5 | 25 | 0.8 | TN**1604... |
| ETGNR/L2020K33W | 20 | 20 | 125 | 19.5 | 25 | 0.8 | TN**1604... |
| ETGNR2525M33 | 25 | 25 | 150 | 24.5 | 32 | 0.8 | TN**1604... |
| ETGNR/L2525M33W | 25 | 25 | 150 | 24.5 | 32 | 0.8 | TN**1604... |

**rε: Standard corner radius

### SPARE PARTS

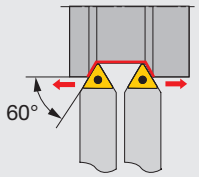
| Designation | E-ring | Pin | Shim | Wrench |
|---|---|---|---|---|
| ETGNR/L1212 | ER2 | P221US | - | KY25 |
| ETGNR/L1616H33 | ER3 | P332US | - | KY40 |
| ETGNR/L2020K33 | ER3 | P333US | - | KY40 |
| ETGNR/L2020K33W | ER3 | P333WS | EST32 | KY40 |
| ETGNR2525M33 | ER3 | P334US | - | KY40 |
| ETGNR/L2525M33W | ER3 | P334WS | EST32 | KY40 |



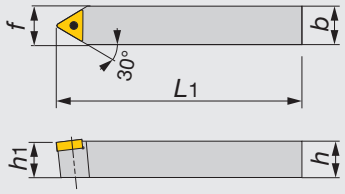
ETANR, ETGNR/L: Inserts → **B079 -**, CBN → **B164 -**, PCD → **B176**

## ETENN

Pin-lock toolholder with 60° approach angle, for negative triangle inserts




Cutting edge style **E**




| Designation | *h* | *b* | $L_1$ | $h_1$ | *f* | $r_\varepsilon$** | Insert |
|---|---|---|---|---|---|---|---|
| ETENN1212 | 12 | 12 | 80 | 11.5 | 6 | 0.4 | TN**1103... |
| ETENN1616H33 | 16 | 16 | 100 | 15.5 | 8 | 0.8 | TN**1604... |
| ETENN2020K33 | 20 | 20 | 125 | 19.5 | 10 | 0.8 | TN**1604... |
| ETENN2020K33W | 20 | 20 | 125 | 19.5 | 10 | 0.8 | TN**1604... |
| ETENN2525M33W | 25 | 25 | 150 | 24.5 | 12.5 | 0.8 | TN**1604... |

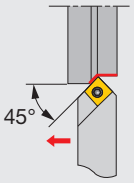
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

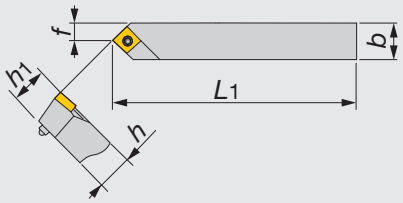
| Designation | E-ring | Pin | Shim | Wrench |
|---|---|---|---|---|
| ETENN1212 | ER2 | P221US | - | KY25 |
| ETENN1616H33 | ER3 | P332US | - | KY40 |
| ETENN2020K33 | ER3 | P333US | - | KY40 |
| ETENN2020K33W | ER3 | P333WS | EST32 | KY40 |
| ETENN2525M33W | ER3 | P334WS | EST32 | KY40 |

## ESDNR/L

Pin-lock toolholder with 45° approach angle, for negative square inserts




Cutting edge style **D**




Right hand (R) shown.

| Designation | *h* | *b* | $L_1$ | $h_1$ | *f* | $r_\varepsilon$** | Insert |
|---|---|---|---|---|---|---|---|
| ESDNR1212 | 12 | 12 | 80 | 11.5 | 6 | 0.8 | SN**0903... |
| ESDNR1616H32 | 16 | 16 | 100 | 15.5 | 8 | 0.8 | SN**0903... |

**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

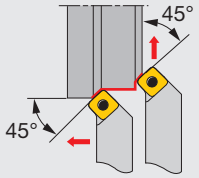
| Designation | E-ring | Pin | Wrench |
|---|---|---|---|
| ESDNR1212 | ER3 | P321US | KY40 |
| ESDNR1616H32 | ER3 | P322US | KY40 |

ETENN: Inserts → **B079 -**, CBN → **B164 -**, PCD → **B176**

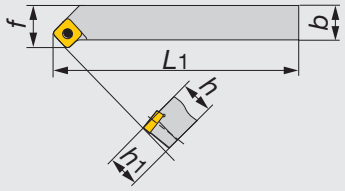
ESDNR/L: Inserts → **B070 -**

## ESSNR/L

Pin-lock toolholder with 45° approach angle, for negative square inserts




Cutting edge style **S**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *h*1 | *f* | *r*ε** | Insert |
|---|---|---|---|---|---|---|---|
| ESSNR1616H32 | 16 | 16 | 100 | 15.5 | 20 | 0.8 | SN**0903... |
| ESSNR2020W | 20 | 20 | 125 | 19.5 | 25 | 0.8 | SN**1204... |

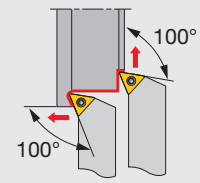
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

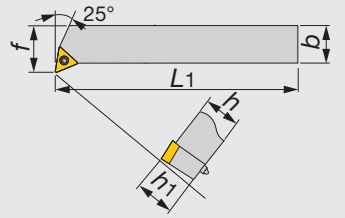
| Designation | E-ring | Pin | Shim | Wrench |
|---|---|---|---|---|
| ESSNR1616H32 | ER3 | P322US | - | KY40 |
| ESSNR2020W | ER3 | P433W | ESS42 | KY40 |

## ETXNR/L

Pin-lock toolholder with 100° approach angle, for negative triangle inserts




Cutting edge style **X**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *h*1 | *f* | *r*ε** | Insert |
|---|---|---|---|---|---|---|---|
| ETXNL1616H33 | 16 | 16 | 100 | 15.5 | 20 | 0.8 | TN**1604... |
| ETXNR2020K33 | 20 | 20 | 125 | 19.5 | 25 | 0.8 | TN**1604... |

**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

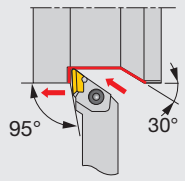
| Designation | E-ring | Pin | Wrench |
|---|---|---|---|
| ETXNL1616H33 | ER3 | P332US | KY40 |
| ETXNR2020K33 | ER3 | P333US | KY40 |


ESSNR/L: Inserts → **B070 -**, CBN → **B164 -**, PCD → **B176**

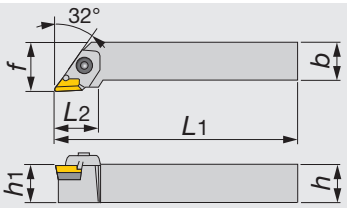
ETXNR/L: Inserts → **B079 -**, CBN → **B164 -**, PCD → **B176**

## CKJNR/L

Clamp-on toolholder with 93° approach angle, for negative 55° parallelogram inserts




Cutting edge style **J**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert |
|---|---|---|---|---|---|---|---|---|
| CKJNR/L2525 | 25 | 25 | 150 | 32 | 25 | 32 | 0.8 | KNMX1604... |

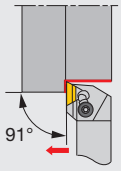
**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

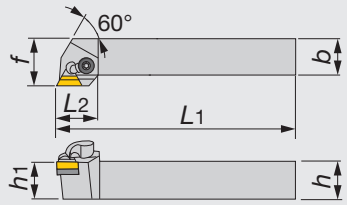
| Designation | Clamp | Pin | Clamping screw | Shim screw | Shim | Spring | Wrench |
|---|---|---|---|---|---|---|---|
| CKJNR2525 | CPK5R | BP-490 | CTS-M6 | SM3X0.5X10 | CSK54R | SP913 | P-4 |
| CKJNL2525 | CPK5L | BP-490 | CTS-M6 | SM3X0.5X10 | CSK54L | SP913 | P-4 |

## CTGNR/L

Clamp-on toolholder with 91° approach angle, for negative triangle inserts




Cutting edge style **G**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert |
|---|---|---|---|---|---|---|---|---|
| CTGNR/L2020 | 20 | 20 | 125 | 28.5 | 20 | 25 | 0.8 | TN**1604... |
| CTGNR/L2525 | 25 | 25 | 150 | 28.5 | 25 | 32 | 0.8 | TN**1604... |

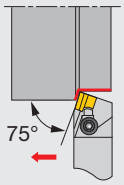
**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

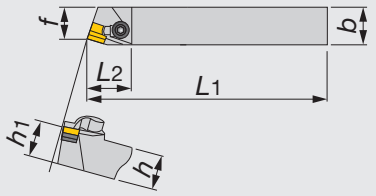
| Designation | Chipbreaker piece | Clamp | Clamping screw | Shim screw | Shim | Wrench |
|---|---|---|---|---|---|---|
| CTGNR/L... | NCT-2M | NF-84A | NDS-8A | SM3X0.5X8 | NAT-32 | P-4 |

## CSBNR/L

Clamp-on toolholder with 75° approach angle, for negative square inserts




Cutting edge style **B**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert |
|---|---|---|---|---|---|---|---|---|
| CSBNR2020 | 20 | 20 | 125 | 31 | 20 | 17 | 0.8 | SN**1204... |
| CSBNR/L2525 | 25 | 25 | 150 | 31 | 25 | 22 | 0.8 | SN**1204... |

**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

| Designation | Chipbreaker piece | Clamp | Clamping screw | Shim screw | Shim | Wrench |
|---|---|---|---|---|---|---|
| CSBNR/L... | NCS-3M | NF-84A | NDS-8A | SM3X0.5X8 | NAS-42 | P-4 |

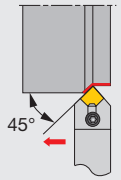
CKJNR/L: Inserts → **B103**

CTGNR/L: Inserts → **B089**, CBN → **B173**

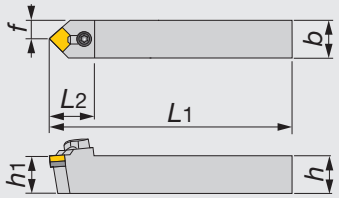
CSBNR/L: Inserts → **B078**, CBN → **B173**, PCD → **B176**

## CSDNN

Clamp-on toolholder with 45° approach angle, for negative square inserts




Cutting edge style **D**




| Designation | h | b | L1 | L2 | h1 | f | rε** | Insert |
|---|---|---|---|---|---|---|---|---|
| CSDNN2020 | 20 | 20 | 125 | 32 | 20 | 10 | 0.8 | SN**1204... |
| CSDNN2525 | 25 | 25 | 150 | 32 | 25 | 12.5 | 0.8 | SN**1204... |

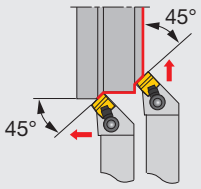
**rε: Standard corner radius

**SPARE PARTS**

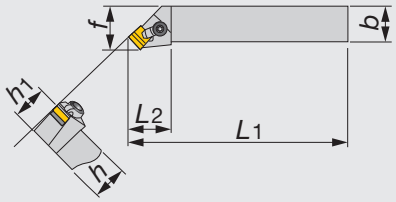
| Designation | Chipbreaker piece | Clamp | Clamping screw | Shim screw | Shim | Wrench |
|---|---|---|---|---|---|---|
| CSDNN... | NCS-3MN | NF-84A | NDS-8A | SM3X0.5X8 | NAS-42 | P-4 |

## CSSNR/L

Clamp-on toolholder with 45° approach angle (S-style), for negative square inserts




Cutting edge style **S**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | rε** | Insert |
|---|---|---|---|---|---|---|---|---|
| CSSNR/L2020 | 20 | 20 | 125 | 31 | 20 | 25 | 0.8 | SN**1204... |
| CSSNR/L2525 | 25 | 25 | 150 | 31 | 25 | 32 | 0.8 | SN**1204... |

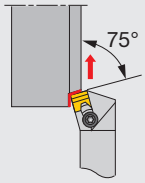
**rε: Standard corner radius

**SPARE PARTS**

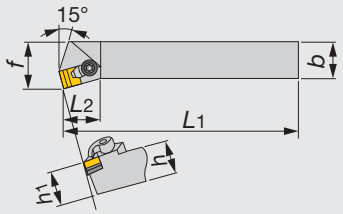
| Designation | Chipbreaker piece | Clamp | Clamping screw | Shim screw | Shim | Wrench |
|---|---|---|---|---|---|---|
| CSSNR/L... | NCS-3M | NF-84A | NDS-8A | SM3X0.5X8 | NAS-42 | P-4 |

## CSKNR/L

Clamp-on toolholder with 75° approach angle, for negative square inserts




Cutting edge style **K**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | rε** | Insert |
|---|---|---|---|---|---|---|---|---|
| CSKNR/L2525 | 25 | 25 | 150 | 25 | 25 | 32 | 0.8 | SN**1204... |

**rε: Standard corner radius

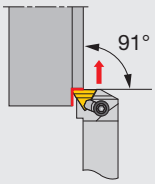
**SPARE PARTS**

| Designation | Chipbreaker piece | Clamp | Clamping screw | Shim screw | Shim | Wrench |
|---|---|---|---|---|---|---|
| CSKNR/L2525 | NCS-3MN | NF-84A | NDS-8A | SM3X0.5X8 | NAS-42 | P-4 |

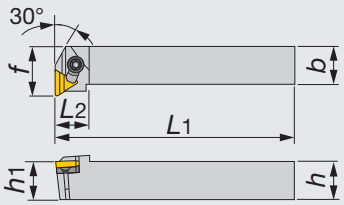
CSDNN, CSSNR/L, CSKNR/L: Inserts → **B078**, CBN → **B173**, PCD → **B176**

## CTFNR/L

Clamp-on toolholder for facing with 91° approach angle, negative triangle inserts




Cutting edge style **F**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | rε** | Insert |
|---|---|---|---|---|---|---|---|---|
| CTFNR/L2020 | 20 | 20 | 125 | 22 | 20 | 25 | 0.8 | TN**1604... |
| CTFNR/L2525 | 25 | 25 | 150 | 22 | 25 | 32 | 0.8 | TN**1604... |

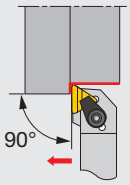
**rε: Standard corner radius

**SPARE PARTS**

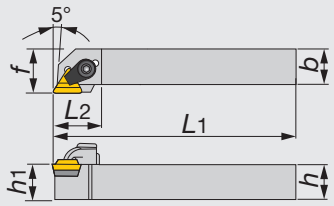
| Designation | Chipbreaker piece | Clamp | Clamping screw | Shim screw | Shim | Wrench |
|---|---|---|---|---|---|---|
| CTFNR/L... | NCT-2M | NF-84A | NDS-8A | SM3X0.5X8 | NAT-32 | P-4 |

## CTGPR/L

Clamp-on toolholder with 90° approach angle, for positive triangle inserts




Cutting edge style **G**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | rε** | Insert |
|---|---|---|---|---|---|---|---|---|
| CTGPR/L1616H3 | 16 | 16 | 100 | 23 | 16 | 20 | 0.8 | TP**1603... |
| CTGPR/L2020K3 | 20 | 20 | 125 | 27 | 20 | 25 | 0.8 | TP**1603... |
| CTGPR/L2525M3 | 25 | 25 | 150 | 27 | 25 | 32 | 0.8 | TP**1603... |

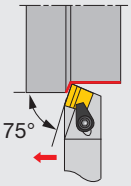
**rε: Standard corner radius

**SPARE PARTS**

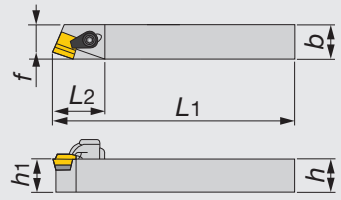
| Designation | Chipbreaker piece | Clamp set | Shim screw | Shim | Wrench |
|---|---|---|---|---|---|
| CTGPR/L1616H3 | CBT-3M | CSG-6L | SM3X0.5X8 | PAT-32 | P-3 |
| CTGPR/L2*2**3 | CBT-3M | CSG-8 | SM3X0.5X8 | PAT-32 | P-4 |

## CSBPR/L

Clamp-on toolholder with 75° approach angle, for positive square inserts




Cutting edge style **B**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | rε** | Insert |
|---|---|---|---|---|---|---|---|---|
| CSBPR/L1616H3 | 16 | 16 | 100 | 25 | 16 | 13 | 0.4 | SP**0903... |
| CSBPR/L2020K4 | 20 | 20 | 125 | 32 | 20 | 17 | 0.8 | SP**1203... |
| CSBPR/L2525M4 | 25 | 25 | 150 | 32 | 25 | 22 | 0.8 | SP**1203... |

**rε: Standard corner radius

**SPARE PARTS**

| Designation | Chipbreaker piece | Clamp set | Shim screw | Shim | Wrench |
|---|---|---|---|---|---|
| CSBPR/L1616H3 | CBS-3M | CSG-6L | SM2.5X0.45X8 | PAS-32 | P-3 |
| CSBPR/L2*2**4 | CBS-4M | CSG-8 | SM3X0.5X8 | PAS-42 | P-4 |

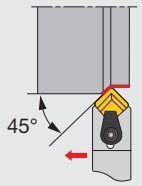
CTFNR/L: Inserts → **B089**, CBN → **B173**

CTGPR/L: Inserts → **B139 -**, CBN → **B170 -**, PCD → **B178**

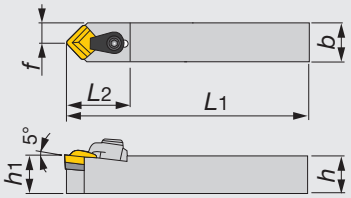
CSBPR/L: Inserts → **B125**, CBN → **B168 -**, PCD → **B177**

## CSDPN

Clamp-on toolholder with 45° approach angle, for positive square inserts




Cutting edge style **D**




| Designation | h | b | L1 | L2 | h1 | f | rε** | Insert |
|---|---|---|---|---|---|---|---|---|
| CSDPN1616H3 | 16 | 16 | 100 | 26 | 16 | 8 | 0.8 | SP**0903... |
| CSDPN2020K4 | 20 | 20 | 125 | 34 | 20 | 10 | 0.8 | SP**1203... |
| CSDPN2525M4 | 25 | 25 | 150 | 34 | 25 | 12.5 | 0.8 | SP**1203... |

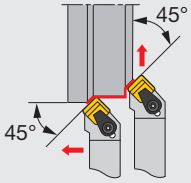
**rε: Standard corner radius

### SPARE PARTS

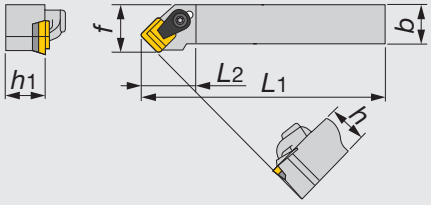
| Designation | Chipbreaker piece | Clamp set | Shim screw | Shim | Wrench |
|---|---|---|---|---|---|
| CSDPN1616H3 | CBS-3MN | CSG-6L | SM2.5X0.45X8 | PAS-32 | P-3 |
| CSDPN2*2**4 | CBS-4MN | CSG-8 | SM3X0.5X8 | PAS-42 | P-4 |

## CSSPR

Clamp-on toolholder with 45° approach angle (S-style), for positive square inserts




Cutting edge style **S**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | rε** | Insert |
|---|---|---|---|---|---|---|---|---|
| CSSPR1616H3 | 16 | 16 | 105.5 | 23 | 16 | 20 | 0.8 | SP**0903... |
| CSSPR2020K4 | 20 | 20 | 133 | 28 | 20 | 25 | 0.8 | SP**1203... |
| CSSPR2525M4 | 25 | 25 | 158 | 28. | 25 | 32 | 0.8 | SP**1203... |

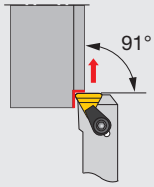
**rε: Standard corner radius

### SPARE PARTS

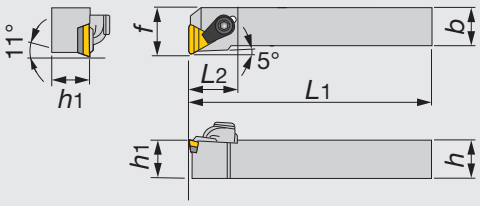
| Designation | Chipbreaker piece | Clamp set | Shim screw | Shim | Wrench |
|---|---|---|---|---|---|
| CSSPR1616H3 | CBS-3M | CSG-6L | SM2.5X0.45X8 | PAS-32 | P-3 |
| CSSPR2*2**4 | CBS-4M | CSG-8 | SM3X0.5X8 | PAS-42 | P-4 |

## CTFPR/L

Clamp-on toolholder for facing with 91° approach angle, positive triangle inserts




Cutting edge style **F**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | rε** | Insert |
|---|---|---|---|---|---|---|---|---|
| CTFPR/L1616H3 | 16 | 16 | 100 | 23 | 16 | 20 | 0.8 | TP**1603... |
| CTFPR/L2020K3 | 20 | 20 | 125 | 26 | 20 | 25 | 0.8 | TP**1603... |
| CTFPR/L2525M3 | 25 | 25 | 150 | 26 | 25 | 32 | 0.8 | TP**1603... |

**rε: Standard corner radius

### SPARE PARTS

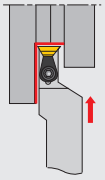
| Designation | Chipbreaker piece | Clamp set | Shim screw | Shim | Wrench |
|---|---|---|---|---|---|
| CTFPR/L1616H3 | CBT-3M | CSG-6L | SM3X0.5X8 | PAT-32 | P-3 |
| CTFPR/L2*2**3 | CBT-3M | CSG-8 | SM3X0.5X8 | PAT-32 | P-4 |

CSDPN, CSSPR: Inserts → **B125**, CBN → **B168 -**, PCD → **B177**

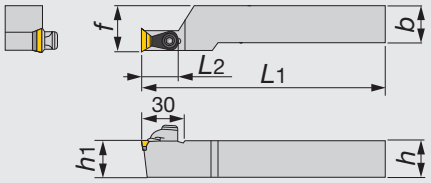
CTFPR/L: Inserts → **B139 -**, CBN → **B170 -**, PCD → **B178**

## CTCPR/L

Clamp-on toolholder for facing with 90° approach angle, positive triangle inserts



Cutting edge style **C**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | rε** | Insert |
|---|---|---|---|---|---|---|---|---|
| CTCPR/L2525M3 | 25 | 25 | 150 | 32 | 25 | 32 | 0.8 | TP**1603... |

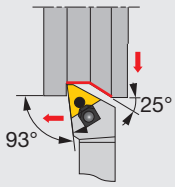
**rε: Standard corner radius

**SPARE PARTS**

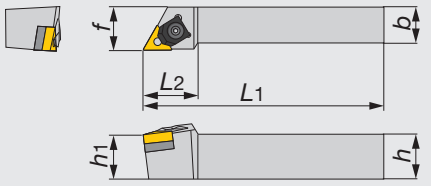
| Designation | Chipbreaker piece | Clamp set | Shim screw | Shim | Wrench |
|---|---|---|---|---|---|
| CTCPR/L2525M3 | CBT-3M | CSW-2 | SM3X0.5X8 | PAT-32 | P-4 |

## WTJNR/L

Wedge-on toolholder with 93° approach angle, for negative triangle inserts




Cutting edge style **J**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | rε** | Insert |
|---|---|---|---|---|---|---|---|---|
| WTJNR2020 | 20 | 20 | 125 | 31 | 20 | 25 | 0.8 | TN**1604... |
| WTJNR/L2525M3 | 25 | 25 | 150 | 31 | 25 | 32 | 0.8 | TN**1604... |

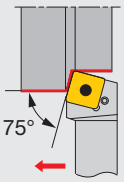
**rε: Standard corner radius

**SPARE PARTS**

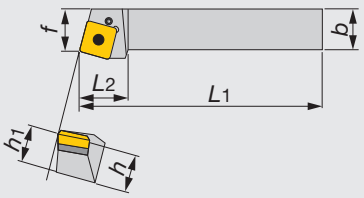
| Designation | Clamp | E-ring | Nut | Pin | Clamping screw | Shim | Wrench |
|---|---|---|---|---|---|---|---|
| WTJNR2020 | WCW3 | 5103-25 | WCN3S | WCP3S | WCS3 | WST33 | P-3 |
| WTJNR/L2525M3 | WCW3 | 5103-25 | WCN3 | WCP3S | WCS3 | WST33 | P-3 |

## HSRNR/L

Retract-pin clamp toolholder with 75° approach angle, for negative square inserts




Cutting edge style **R**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | rε** | Insert |
|---|---|---|---|---|---|---|---|---|
| HSRNR/L4040R | 40 | 40 | 200 | 50 | 40 | 43 | 1.6 | SNMM3109... |
| HSRNR/L5050S | 50 | 50 | 250 | 60 | 50 | 53 | 1.6 | SNMM3109... |

**rε: Standard corner radius

**SPARE PARTS**

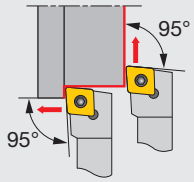
| Designation | Pin | Clamping screw | Shim | Wrench |
|---|---|---|---|---|
| HSRNR/L... | SW99 | LS-8 | NAS-04 | P-4 |

CTCPR/L: Inserts → **B139 -**, CBN → **B170 -**, PCD → **B178**

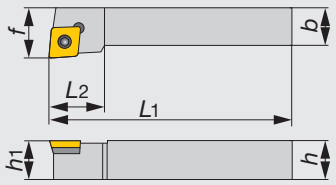
WTJNR/L: Inserts → **B079 -**, CBN → **B164 -**, PCD → **B176**

## SCLCR/L

Screw-on clamp toolholder with 95° approach angle, for positive 80° rhombic inserts




Cutting edge style **L**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert |
|---|---|---|---|---|---|---|---|---|
| SCLCR/L1616H09 | 16 | 16 | 100 | 16 | 16 | 20 | 0.8 | CC**09T3... |
| SCLCR/L2020K12 | 20 | 20 | 125 | 20 | 20 | 25 | 0.8 | CC**1204... |

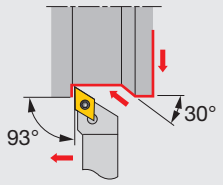
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

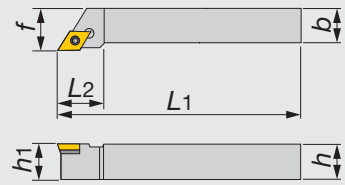
| Designation | Clamping screw | Shim screw | Shim | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|
| SCLCR/L1616H09 | CSTB-3.5L | DTS5-3.5 | SSC32 | P-3.5 | T-15F |
| SCLCR/L2020K12 | CSTB-4F | DTS6-4 | SSC4T3 | P-4 | T-15F |

## SDJCR/L

Screw-on clamp toolholder with 93° approach angle, for positive 55° rhombic inserts




Cutting edge style **J**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert |
|---|---|---|---|---|---|---|---|---|
| SDJCR1616H11 | 16 | 16 | 100 | 20 | 16 | 20 | 0.8 | DC**11T3... |
| SDJCR/L2020K11 | 20 | 20 | 125 | 20.5 | 20 | 25 | 0.8 | DC**11T3... |
| SDJCR/L2525M11 | 25 | 25 | 150 | 21.5 | 25 | 32 | 0.8 | DC**11T3... |

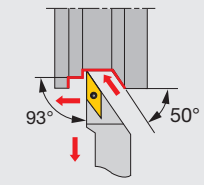
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

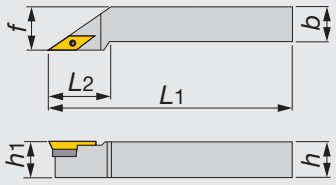
| Designation | Clamping screw | Shim screw | Shim | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|
| SDJCR/L... | CSTB-3.5L | DTS5-3.5 | SSD32 | P-3.5 | T-15F |

## SVJCR/L

Screw-on clamp toolholder with 93° approach angle, for positive 35° rhombic inserts




Cutting edge style **J**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert |
|---|---|---|---|---|---|---|---|---|
| SVJCR/L1616H16 | 16 | 16 | 100 | 32 | 16 | 20 | 0.8 | VC**1604... |
| SVJCR/L2020K16 | 20 | 20 | 125 | 32 | 20 | 25 | 0.8 | VC**1604... |
| SVJCR/L2525M16 | 25 | 25 | 150 | 40 | 25 | 32 | 0.8 | VC**1604... |

**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

| Designation | Clamping screw | Shim screw | Shim | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|
| SVJCR/L... | CSTB-3.5L | DTS5-3.5 | SSV32 | P-3.5 | T-15F |

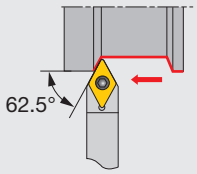
SCLCR/L: Inserts → **B104 -**, CBN → **B168 -**, PCD → **B177**

SDJCR/L: Inserts → **B114 -**, CBN → **B168 -**, PCD → **B177**

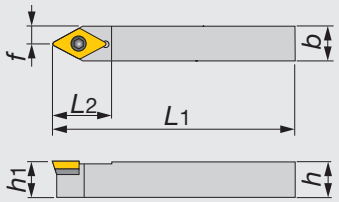
SVJCR/L: Inserts → **B145 -**, CBN → **B169 -**, PCD → **B177 -**

## SDNCN

Screw-on clamp toolholder with 62.5° approach angle, for positive 55° rhombic inserts




Cutting edge style **N**




| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert |
|---|---|---|---|---|---|---|---|---|
| SDNCN1616H11 | 16 | 16 | 100 | 21 | 16 | 8 | 0.8 | DC**11T3... |
| SDNCN2020K11 | 20 | 20 | 125 | 21 | 20 | 10 | 0.8 | DC**11T3... |
| SDNCN2525M11 | 25 | 25 | 150 | 21 | 25 | 12.5 | 0.8 | DC**11T3... |

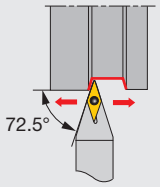
**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

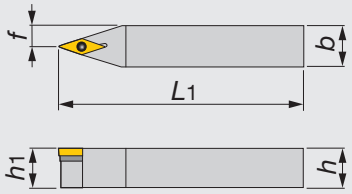
| Designation | Clamping screw | Shim screw | Shim | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|
| SDNCN... | CSTB-3.5L | DTS5-3.5 | SSD32 | P-3.5 | T-15F |

## SVVCN

Screw-on clamp toolholder with 72.5° approach angle, for positive 35° rhombic inserts




Cutting edge style **V**




| Designation | *h* | *b* | *L*1 | *h*1 | *f* | *r*ε** | Insert |
|---|---|---|---|---|---|---|---|
| SVVCN2020K16 | 20 | 20 | 125 | 20 | 10 | 0.8 | VC**1604... |
| SVVCN2525M16 | 25 | 25 | 150 | 25 | 12.5 | 0.8 | VC**1604... |

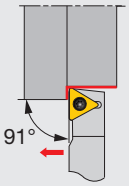
**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

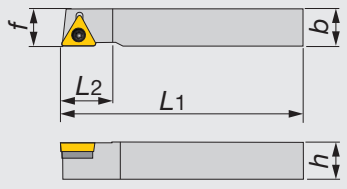
| Designation | Clamping screw | Shim screw | Shim | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|
| SVVCN... | CSTB-3.5L | DTS5-3.5 | SSV32 | P-3.5 | T-15F |

## STACR/L

Screw-on toolholder with 91° approach angle, for positive triangle inserts




Cutting edge style **A**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert |
|---|---|---|---|---|---|---|---|---|
| STACR/L1616H16 | 16 | 16. | 100 | 22.5 | 16 | 16 | 0.8 | TC**16T3... |

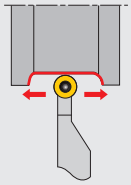
**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

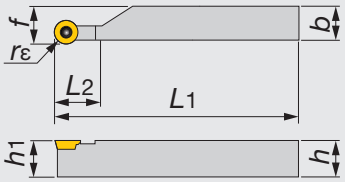
| Designation | Clamping screw | Shim screw | Shim | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|
| STACR/L... | CSTB-3.5L | DTS5-3.5 | SST32 | P-3.5 | T-15F |

## SRACR/L

Screw-on toolholder with 91° approach angle, for positive round inserts



Cutting edge style **A**




Right hand (R) shown.

| Designation | *h* | *b* | $L_1$ | $L_2$ | $h_1$ | *f* | $r_\varepsilon$** | Insert |
|---|---|---|---|---|---|---|---|---|
| SRACR1010H05 | 10 | 10 | 100 | 10 | 10 | 10.3 | 2.5 | RCMT0502... |
| SRACR/L1212H05 | 12 | 12 | 100 | 10 | 12 | 12.3 | 2.5 | RCMT0502... |
| SRACR/L1212H06 | 12 | 12 | 100 | 12 | 12 | 12.4 | 3 | RC*T0602... |
| SRACR1616H05 | 16 | 16 | 100 | 10 | 16 | 16.3 | 2.5 | RCMT0502... |
| SRACR/L1616H06 | 16 | 16 | 100 | 12 | 16 | 16.4 | 3 | RC*T0602... |
| SRACR/L1616H08 | 16 | 16 | 100 | 16 | 16 | 16.5 | 4 | RC*T0803... |
| SRACR/L2020K05 | 20 | 20 | 125 | 10 | 20 | 20.3 | 2.5 | RCMT0502... |
| SRACR/L2020K06 | 20 | 20 | 125 | 12 | 20 | 20.4 | 3 | RC*T0602... |
| SRACR/L2020K08 | 20 | 20 | 125 | 16 | 20 | 20.5 | 4 | RC*T0803... |
| SRACR/L2525M05 | 25 | 25 | 150 | 10 | 25 | 25.3 | 2.5 | RCMT0502... |
| SRACR/L2525M06 | 25 | 25 | 150 | 12 | 25 | 25.4 | 3 | RC*T0602... |
| SRACR/L2525M08 | 25 | 25 | 150 | 16 | 25 | 25.5 | 4 | RC*T0803... |

**$r_\varepsilon$: Standard corner radius

### SPARE PARTS




| Designation | Clamping screw | Wrench |
|---|---|---|
| SRACR/L1*1*H05 | CSTB-2.2R | T-7F |
| SRACR/L1212H06 | CSTB-2.5 | T-8F |
| SRACR1616H05 | CSTB-2.2R | T-7F |
| SRACR/L1616H06 | CSTB-2.5 | T-8F |
| SRACR/L1616H08 | CSTB-3 | T-9F |
| SRACR/L2020K05 | CSTB-2.2R | T-7F |
| SRACR/L2020K06 | CSTB-2.5 | T-8F |
| SRACR/L2020K08 | CSTB-3 | T-9F |
| SRACR/L2525M05 | CSTB-2.2R | T-7F |
| SRACR/L2525M06 | CSTB-2.5 | T-8F |
| SRACR/L2525M08 | CSTB-3 | T-9F |


SDNCN: Inserts → **B114 -**, CBN → **B168 -**, PCD → **B177**

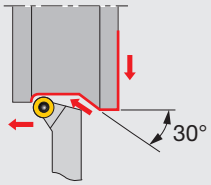
SVVCN: Inserts → **B145 -**, CBN → **B169 -**, PCD → **B177 -**

STACR/L: Inserts → **B126 -**

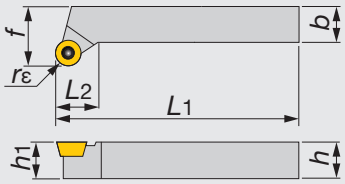
SRACR/L: Inserts → **B152 -**

## SRGCR/L

Screw-on toolholder with 91° approach angle, for positive round inserts




Cutting edge style **G**




Right hand (R) shown.

| Designation | *h* | *b* | $L_1$ | $L_2$ | $h_1$ | *f* | $r_\varepsilon$** | Insert |
|---|---|---|---|---|---|---|---|---|
| SRGCR1212H05 | 12 | 12 | 100 | 9.5 | 12 | 16 | 2.5 | RCMT0502... |
| SRGCR/L1212H06 | 12 | 12 | 100 | 10 | 12 | 16 | 3 | RC*T0602... |
| SRGCR/L1616H05 | 16 | 16 | 100 | 9.5 | 16 | 20 | 2.5 | RCMT0502... |
| SRGCR/L1616H06 | 16 | 16 | 100 | 10 | 16 | 20 | 3 | RC*T0602... |
| SRGCR/L1616H08 | 16 | 16 | 100 | 11 | 16 | 20 | 4 | RC*T0803... |
| SRGCR/L2020K05 | 20 | 20 | 125 | 11.2 | 20 | 25 | 2.5 | RCMT0502... |
| SRGCR/L2020K06 | 20 | 20 | 125 | 12 | 20 | 25 | 3 | RC*T0602... |
| SRGCR/L2020K08 | 20 | 20 | 125 | 12.7 | 20 | 25 | 4 | RC*T0803... |
| SRGCR/L2020K10 | 20 | 20 | 125 | 14 | 25 | 25 | 5 | RC*T1003... |
| SRGCR/L2525M05 | 25 | 25 | 150 | 14.7 | 25 | 32 | 2.5 | RCMT0502... |
| SRGCR/L2525M06 | 25 | 25 | 150 | 15 | 25 | 32 | 3 | RC*T0602... |
| SRGCR/L2525M08 | 25 | 25 | 150 | 16.2 | 25 | 32 | 4 | RC*T0803... |
| SRGCR/L2525M10 | 25 | 25 | 150 | 17.5 | 25 | 32 | 5 | RC*T1003... |

**$r_\varepsilon$: Standard corner radius

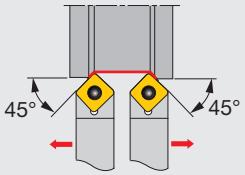
### SPARE PARTS

| Designation | Clamping screw | Shim screw | Shim | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|
| SRGCR1212H05 | CSTB-2.2R | - | - | - | T-7F |
| SRGCR/L1212H06 | CSTB-2.5 | - | - | - | T-8F |
| SRGCR/L1616H05 | CSTB-2.2R | - | - | - | T-7F |
| SRGCR/L1616H06 | CSTB-2.5 | - | - | - | T-8F |
| SRGCR/L1616H08 | CSTB-3 | - | - | - | T-9F |
| SRGCR/L2020K05 | CSTB-2.2R | - | - | - | T-7F |
| SRGCR/L2020K06 | CSTB-2.5 | - | - | - | T-8F |
| SRGCR/L2020K08 | CSTB-3 | - | - | - | T-9F |
| SRGCR/L2020K10 | CSTB-3.5L | DTS5-3.5 | SSR32 | P-3.5 | T-15F |
| SRGCR/L2525M05 | CSTB-2.2R | - | - | - | T-7F |
| SRGCR/L2525M06 | CSTB-2.5 | - | - | - | T-8F |
| SRGCR/L2525M08 | CSTB-3 | - | - | - | T-9F |
| SRGCR/L2525M10 | CSTB-3.5L | DTS5-3.5 | SSR32 | P-3.5 | T-15F |

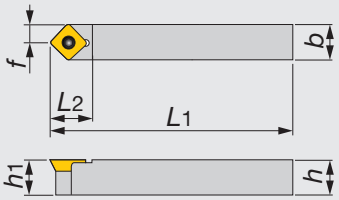
SRGCR/L: Inserts → **B152 -**

## SSDC/PN

Screw-on clamp toolholder with 45° approach angle, for positive square inserts




Cutting edge style **D**




| Designation | *h* | *b* | $L_1$ | $L_2$ | $h_1$ | *f* | $r_\varepsilon$** | Insert |
|---|---|---|---|---|---|---|---|---|
| SSDCN1010K07 | 10 | 10 | 125 | 12 | 10 | 5 | 0.4 | SC**0702... |
| SSDPN1010H | 10 | 10 | 100 | 12 | 10 | 5 | 0.4 | SP*P042... |
| SSDCN1212K09 | 12 | 12 | 125 | 15 | 12 | 6 | 0.8 | SC**09T3... |
| SSDPN1212H | 12 | 12 | 100 | 12 | 12 | 6 | 0.4 | SP*P042... |
| SSDCN1616H09 | 16 | 16 | 100 | 15 | 16 | 8 | 0.8 | SC**09T3... |
| SSDPN1616H | 16 | 16 | 100 | 14 | 16 | 8 | 0.8 | SP*M322... |

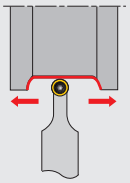
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

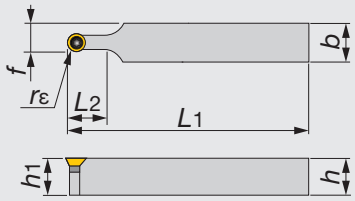
| Designation | Clamping screw | Shim screw | Shim | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|
| SSDCN1010K07 | CSTB-3 | - | - | - | T-9F |
| SSDPN1010H | CSTA-NO3 | - | - | - | T-9F |
| SSDCN1212K09 | CSTB-4 | - | - | - | T-15F |
| SSDPN1212H | CSTA-NO3 | - | - | - | T-9F |
| SSDCN1616H09 | CSTB-3.5L | DTS5-3.5 | SSS32 | P-3.5 | T-15F |
| SSDPN1616H | CSTA-NO5 | - | - | - | T-9F |

## SRDCN

Screw-on toolholder with 45° approach angle, for positive round inserts



Cutting edge style **D**




| Designation | *h* | *b* | $L_1$ | $L_2$ | $h_1$ | *f* | $r_\varepsilon$** | Insert |
|---|---|---|---|---|---|---|---|---|
| SRDCN2020K06 | 20 | 20 | 125 | 12 | 20 | 13 | 3 | RC*T0602... |
| SRDCN2020K08 | 20 | 20 | 125 | 16 | 20 | 14 | 4 | RC*T0803... |
| SRDCN2020K10 | 20 | 20 | 125 | 20.3 | 25 | 15 | 5 | RC*T1003... |
| SRDCN2525M06 | 25 | 25 | 150 | 12 | 25 | 15.5 | 3 | RC*T0602... |
| SRDCN2525M08 | 25 | 25 | 150 | 16 | 25 | 16.5 | 4 | RC*T0803... |
| SRDCN2525M10 | 25 | 25 | 150 | 20.3 | 25 | 17.5 | 5 | RC*T1003... |

**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

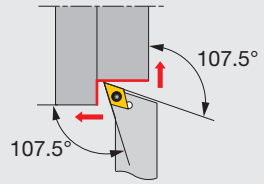
| Designation | Clamping screw | Shim screw | Shim | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|
| SRDCN2020K06 | CSTB-2.5 | - | - | - | T-8F |
| SRDCN2020K08 | CSTB-3 | - | - | - | T-9F |
| SRDCN2020K10 | CSTB-3.5L | DTS5-3.5 | SSR32 | P-3.5 | T-15F |
| SRDCN2525M06 | CSTB-2.5 | - | - | - | T-8F |
| SRDCN2525M08 | CSTB-3 | - | - | - | T-9F |
| SRDCN2525M10 | CSTB-3.5L | DTS5-3.5 | SSR32 | P-3.5 | T-15F |

SSDC/PN: Inserts → **B122, E100**

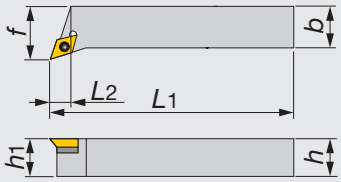
SRDCN: Inserts → **B152 -**

## SDQCR/L

Screw-on clamp toolholder with 107.5° approach angle, for positive 55° rhombic inserts




Cutting edge style **Q**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert |
|---|---|---|---|---|---|---|---|---|
| SDQCR/L2020K11 | 20 | 20 | 125 | 20.5 | 20 | 25 | 0.8 | DC**11T3... |
| SDQCR2525M11 | 25 | 25 | 150 | 21.5 | 25 | 32 | 0.8 | DC**11T3... |

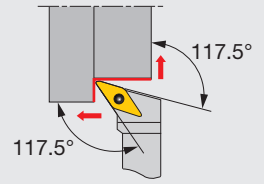
**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

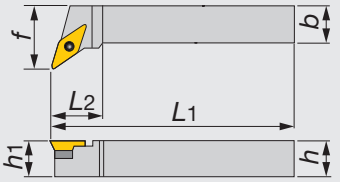
| Designation | Clamping screw | Shim screw | Shim | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|
| SDQCR/L... | CSTB-3.5L | DTS5-3.5 | SSD32 | P-3.5 | T-15F |

## SVQCR/L

Screw-on clamp toolholder with 117.5° approach angle, for positive 35° rhombic inserts




Cutting edge style **Q**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert |
|---|---|---|---|---|---|---|---|---|
| SVQCR/L2020K16 | 20 | 20 | 125 | 35 | 20 | 27 | 0.8 | VC**1604... |
| SVQCR/L2525M16 | 25 | 25 | 150 | 35 | 25 | 32 | 0.8 | VC**1604... |

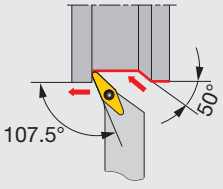
**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

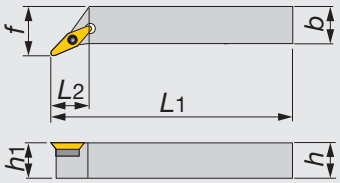
| Designation | Clamping screw | Shim screw | Shim | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|
| SVQCR/L... | CSTB-3.5L | DTS5-3.5 | SSV32 | P-3.5 | T-15F |

## SVHCR/L

Screw-on clamp toolholder with 107.5° approach angle, for positive 35° rhombic inserts




Cutting edge style **H**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert |
|---|---|---|---|---|---|---|---|---|
| SVHCR/L2525M22 | 25 | 25 | 150 | 33.8 | 25 | 32 | 0.8 | VCG*2205... |

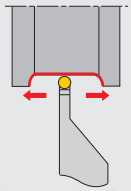
**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

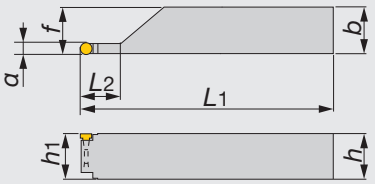
| Designation | Clamping screw | Shim screw | Shim | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|
| SVHCR/L2525M22 | CSTB-4.5L110P | DTS6-4.5 | SSV42 | P-4.5 | T-15F |

## TRACN

Taper-lock toolholder with 91° approach angle, for RT type tapered round inserts



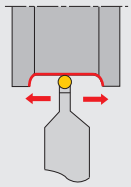
Cutting edge style **A**



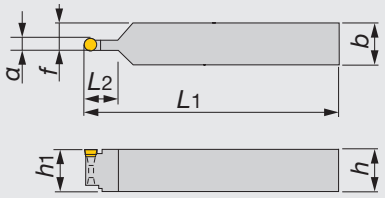

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *α* | Insert |
|---|---|---|---|---|---|---|---|---|
| TRACN2020K05 | 20 | 20 | 125 | 20 | 20 | 20.3 | 5 | RT05 |
| TRACN2020K06 | 20 | 20 | 125 | 22 | 20 | 20.4 | 6 | RT06 |
| TRACN2525M05 | 25 | 25 | 150 | 20 | 25 | 25.3 | 5 | RT05 |
| TRACN2525M06 | 25 | 25 | 150 | 22 | 25 | 25.4 | 6 | RT06 |
| TRACN2525M08 | 25 | 25 | 150 | 25 | 25 | 25.5 | 8 | RT08 |

## TRDCN

Taper-lock toolholder with 45° approach angle, for RT type tapered round inserts



Cutting edge style **D**




| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *α* | Insert |
|---|---|---|---|---|---|---|---|---|
| TRDCN2020K05 | 20 | 20 | 125 | 20 | 20 | 12.5 | 5 | RT05 |
| TRDCN2525M05 | 25 | 25 | 150 | 20 | 25 | 15 | 5 | RT05 |
| TRDCN2525M06 | 25 | 25 | 150 | 22 | 25 | 15.5 | 6 | RT06 |



SDQCR/L: Inserts → **B114 -**, CBN → **B168 -**, PCD → **B177**

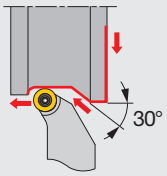
SVQCR/L: Inserts → **B145 -**, CBN → **B169 -**, PCD → **B177 -**

SVHCR/L: Inserts → **B146**

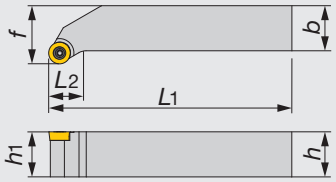
TRACN, TRDCN: Inserts → **B153**

# FIXRTURN SRGCR/L

Screw-on toolholder with 91° approach angle, for positive round inserts




Cutting edge style **G**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|
| SRGCR/L2525M12-6F | 25 | 25 | 150 | 18.6 | 25 | 32 | RCMT1204M0-6RS/-6RM | 3 |

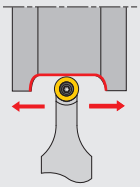
*Torque: Recommended torque (N·m) for clamping

**SPARE PARTS**

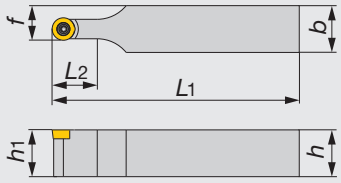
| Designation | Clamping screw | Lubricant | Wrench |
|---|---|---|---|
| SRGCR/L2525M12-6F | CSTB-4 | M-1000 | T-15F |

# FIXRTURN SRDCN

Screw-on toolholder with 45° approach angle, for positive round inserts



Cutting edge style **D**




| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|
| SRDCN2525M12-6F | 25 | 25 | 150 | 24.1 | 25 | 18.5 | RCMT1204M0-6RS/-6RM | 3 |

*Torque: Recommended torque (N·m) for clamping

**SPARE PARTS**

| Designation | Clamping screw | Lubricant | Wrench |
|---|---|---|---|
| SRDCN2525M12-6F | CSTB-4 | M-1000 | T-15F |

SRGCR/L, SRDCN: Inserts → **B253**, Standard cutting conditions → **B253**

## INSERT

### RCMT



6RS



6RM

| Designation | Coating | | Cermet | ød | s | ød1 |
|---|---|---|---|---|---|---|
| | T9115 | T9125 | NS9530 | | | |
| RCMT1204M0-6RS | ● | ● | ● | 12 | 4.76 | 5.16 |
| RCMT1204M0-6RM | ● | ● | ● | 12 | 4.76 | 5.16 |

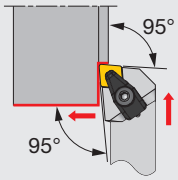
● : Line-up

## STANDARD CUTTING CONDITIONS

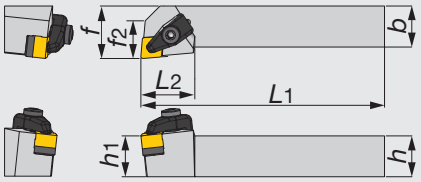
| ISO | Workpiece material | Chip-breaker | Grade | Cutting speed *Vc* (m/min) | Depth of cut *ap* (mm) | Feed *f* (mm/rev) |
|---|---|---|---|---|---|---|
| P | Steels<br>C45, 18CrMo4, etc. | 6RS | T9115 | 150 - 300 | 0.5 - 2.0 | 0.5 - 1.0 |
| | | 6RS | T9125 | 120 - 250 | 0.5 - 2.0 | 0.5 - 1.0 |
| | | 6RS | NS9530 | 150 - 250 | 0.5 - 2.0 | 0.5 - 1.0 |
| | | 6RM | T9115 | 150 - 300 | 1.0 - 3.0 | 0.5 - 1.0 |
| | | 6RM | T9125 | 120 - 250 | 1.0 - 3.0 | 0.5 - 1.0 |
| | | 6RM | NS9530 | 150 - 250 | 1.0 - 3.0 | 0.5 - 1.0 |

## DIMPLEFX
## CCLNR/L-RD

Double-clamp toolholder for ceramic insert with dimple, 95° approach angle, for negative 80° rhombic inserts




Cutting edge style **L**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *f*2 | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| CCLNR/L2525M1207-RD | 25 | 25 | 150 | 33 | 25 | 32 | 23 | 1.2 | CN*D1207... | 4 |
| CCLNR3225P1207-RD | 32 | 25 | 170 | 33 | 32 | 32 | 23 | 1.2 | CN*D1207... | 4 |

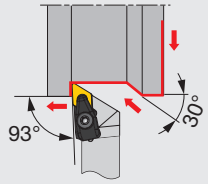
*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

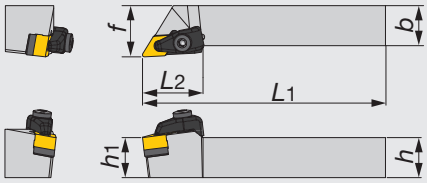
| Designation | Clamp | Clamp screw | Shim | Shim screw | Spring | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|---|
| CCLNR/L**-RD | CCP4-A | CCS4-A | CC44-A | BH5-10-A | BP-5-A | P-3 | P-4 |

## DIMPLEFX
## CDJNR/L-RD

Double-clamp toolholder for ceramic insert with dimple, 93° approach angle, for negative 55° rhombic inserts




Cutting edge style **J**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| CDJNR/L2525M1507-RD | 25 | 25 | 150 | 38 | 25 | 32 | 1.2 | DN*D1507... | 4 |
| CDJNR3225P1507-RD | 32 | 25 | 170 | 38 | 32 | 32 | 1.2 | DN*D1507... | 4 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

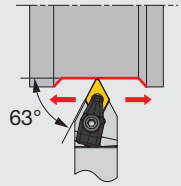
| Designation | Clamp | Clamp screw | Shim | Shim screw | Spring | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|---|
| CDJNR/L**-RD | CCP4-A | CCS4-A | CD44-A | BH5-10-A | BP-5-A | P-3 | P-4 |

CCLNR/L-RD: Inserts → **B060**, Standard cutting conditions → **B256**

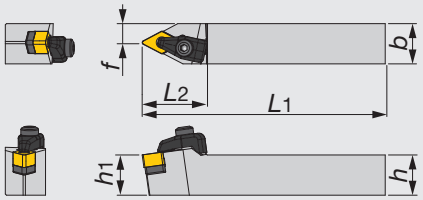
CDJNR/L-RD: Inserts → **B069**, Standard cutting conditions → **B256**

## DIMPLEFX CDNNN-RD

Double-clamp toolholder for ceramic insert with dimple, 63° approach angle, for negative 55° rhombic inserts




Cutting edge style **N**




| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| CDNNN2525M1507-RD | 25 | 25 | 150 | 40 | 25 | 12.5 | 1.2 | DN*D1507... | 4 |

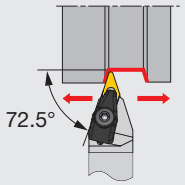
*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

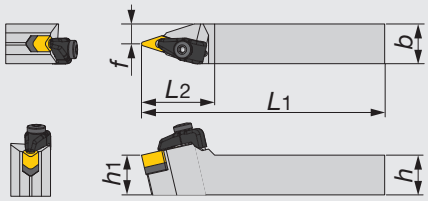
| Designation | Clamp | Clamp screw | Shim | Shim screw | Spring | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|---|
| CDNNN2525M1507-RD | CCP4-A | CCS4-A | CD44-A | BH5-10-A | BP-5-A | P-3 | P-4 |

## DIMPLEFX CVVNN-RD

Double-clamp toolholder for ceramic insert with dimple, 72.5° approach angle, for negative 35° rhombic inserts




Cutting edge style **V**




| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| CVVNN2525M1607-RD | 25 | 25 | 150 | 46 | 25 | 12.5 | 1.2 | VN*D160712 | 4 |

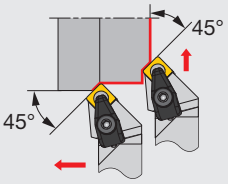
*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

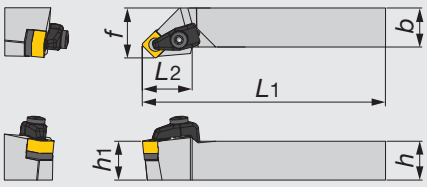
| Designation | Clamp | Clamp screw | Shim | Shim screw | Spring | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|---|
| CVVNN2525M1607-RD | CCP4-A | CCS4-A | CV34-A | BH-4-10-A | BP-5-A | P-3 | P-4 |

## DIMPLEFX CSSNR/L-RD

Double-clamp toolholder for ceramic insert with dimple, 45° approach angle, for negative square inserts




Cutting edge style **S**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| CSSNR/L2525M1207-RD | 25 | 25 | 150 | 32 | 25 | 32 | 1.2 | SN*D1207... | 4 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

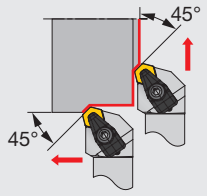
**SPARE PARTS**

| Designation | Clamp | Clamp screw | Shim | Shim screw | Spring | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|---|
| CSSNR/L2525M1207-RD | CCP4-A | CCS4-A | CS44-A | BH5-10-A | BP-5-A | P-3 | P-4 |

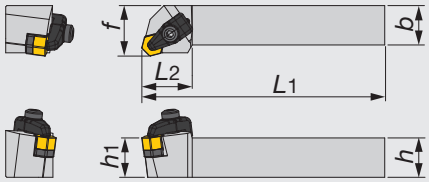
CDNNN-RD: Inserts → **B069**, CVVNN-RD: Inserts → **B101**, CSSNR/L-RD: Inserts → **B078**
Standard cutting conditions → **B256**

# DIMPLEFX
## CHSNR-RD

Double-clamp toolholder for ceramic insert with dimple, 45° approach angle, for negative hexagonal inserts




Cutting edge style **S**




Right hand (R) shown.

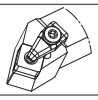
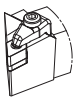
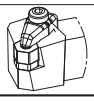
| Designation | *h* | *b* | $L_1$ | $L_2$ | $h_1$ | *f* | $r_\varepsilon$** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| CHSNR2525M0507-RD | 25 | 25 | 150 | 32 | 25 | 32 | 1.2 | HN*D0507... | 4 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

| Designation | Clamp | Clamp screw | Shim | Shim screw | Spring | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|---|
| CHSNR2525M0507-RD | CCP4-A | CCS4-A | CH44-A | BH-40050-A | BP-5-A | P-3 | P-4 |

## Parts for C-type

| Toolholders Designation | Applicable Insert Designation | | Clamp | Clamp screw | Shim | Shim screw | Spring | Wrench |
|---|---|---|---|---|---|---|---|---|
| **CCLNR2525M1207-RD** | **CNGD1207□□** |  | **CCP4-A** | **CCS4-A** | **CC44-A** | **BH5-10-A** | **BP-5-A** | **P-4 P-3** |
| **CCLNL2525M1207-RD** | | | | | | | | |
| **CCLNR3225P1207-RD** | | | | | | | | |
| **CSSNR2525M1207-RD** | **SNGD1207□□** |  | | | **CS44-A** | | | |
| **CSSNL2525M1207-RD** | | | | | | | | |
| **CDJNR2525M1507-RD** | **DNGD1507□□** |  | | | **CD44-A** | | | |
| **CDJNL2525M1507-RD** | | | | | | | | |
| **CDJNR3225P1507-RD** | | | | | | | | |
| **CDNNN2525M1507-RD** | **DNGD1507□□** |  | | | | | | |
| **CVVNN2525M1607-RD** | **VNGD160712** |  | | | **CV34-A** | **BH-4-10-A** | | |
| **CHSNR2525M0507-RD** | **HNGD0507□□** |  | | | **CH44-A** | **BH-40050-A** | | |

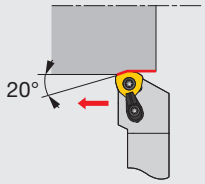
## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Grade | Cutting speed *Vc* (m/min) | Depth of cut *ap* (mm) | Feed *f* (mm/rev) |
|---|---|---|---|---|---|
| K | Grey cast irons | FX105 | 700 (300 - 1000) | 1 (0.05 - 3) | 0.3 (0.05 - 0.6) |
| | Ductile cast irons | FX105 | 200 (100 - 300) | 1 (0.05 - 3) | 0.2 (0.05 - 0.4) |

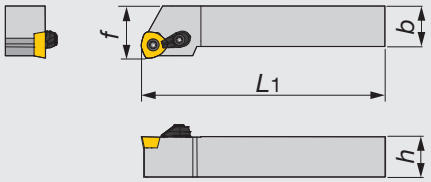
CHSNR-RD: Inserts → **B103**, Standard cutting conditions → **B256**

# XWXPR/L

Double clamping toolholder with 20° approach angle for roughing operation with positive trigon inserts




Cutting edge style **X**




Right hand (R) shown.

| Designation | *h* | *b* | $L_1$ | *f* | Insert |
|---|---|---|---|---|---|
| XWXPR/L2525M09 | 25 | 25 | 150 | 32 | WPMT090725ZPR/L-ML |
| XWXPR/L3232P09 | 32 | 32 | 170 | 40 | WPMT090725ZPR/L-ML |
| XWXPR/L4040S09 | 40 | 40 | 250 | 50 | WPMT090725ZPR/L-ML |

## SPARE PARTS

| Designation | Clamp set | Clamping screw | Wrench |
|---|---|---|---|
| XWXPR/L... | CSY-20 | CSPB-5 | IP-20T |

Note: Care should be taken not to confuse the hand of inserts to be used.

## INSERT

### WPMT09-ML

● : Continuous cutting
◐ : Light interrupted cutting
✣ : Heavy interrupted cutting



**Trigon, 80° with hole Positive 11°**

| | | Coating | | |
|---|---|---|---|---|
| | | T9115 | T9125 | AH120 |
| P | Steel | ●◐ | ◐✣ | ●◐ |
| M | Stainless | | | ●◐ |
| K | Cast iron | ●◐ | | ●◐ |
| N | Non-ferrous | | | |
| S | Superalloys | | | ●◐ |
| H | Hard materials | | | |

| Application | Chipbreaker | Designation | Corner radius | T9115 | T9125 | AH120 |
|---|---|---|---|---|---|---|
| Heavy | ML | WPMT090725ZPR-ML | 2.5 | ● | ● | ● |
| | | WPMT090725ZPL-ML | 2.5 | ● | ● | ● |



● : Line-up

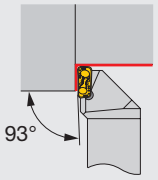
## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Grade | Chipbreaker | Cutting speed: *Vc* (m/min) | Depth of cut: *ap* (mm) | Feed: *f* (mm/rev) |
|---|---|---|---|---|---|---|
| P | Mild and low carbon steels E275A, C15E4, etc. < 180 HB | T9125 | ML | 150 (100 - 250) | 0.5 - 2.5 | 1.5 (0.5 - 2.5) |
| | Carbon and alloy steels C55, 42CrMo4, etc. < 300HB | T9115 | ML | 150 (100 - 250) | 0.5 - 2.5 | 1.5 (0.5 - 2.5) |
| M | Stainless steels X5CrNi18-9, X5CrNiMo17-12-3, etc. < 250 HB | T9125 | ML | 150 (100 - 250) | 0.5 - 2.5 | 1.5 (0.5 - 2.5) |
| K | Grey and ductile cast irons 250, 400-15S, etc. | AH120 | ML | 150 (100 - 250) | 0.5 - 2.5 | 1.5 (0.5 - 2.5) |

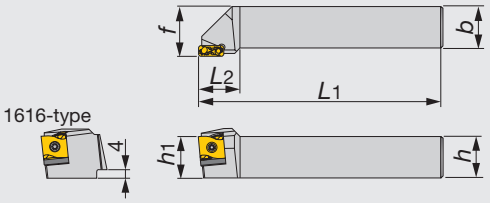
Note: When the side cutting edge is used for facing, the maximum feed is limited to within 1.0 mm/rev.

Screw-on clamp toolholder for roughing operation with 93° approach angle, for negative tangential inserts






Cutting edge style **A**




Right hand (R) shown.

| Designation | *h* | *b* | $L_1$ | $L_2$ | $h_1$ | *f* | Insert |
|---|---|---|---|---|---|---|---|
| TLANR/L1616H12 | 16 | 16 | 100 | 20 | 16 | 20 | LNMX1204**R/L... |
| TLANR/L1616M12S | 16 | 16 | 150 | 20 | 16 | 20 | LNMX1204**R/L... |
| TLANR/L2020K12 | 20 | 20 | 125 | 20 | 20 | 25 | LNMX1204**R/L... |
| TLANR/L2020K16 | 20 | 20 | 125 | 25 | 20 | 25 | LNMX1606**R/L... |
| TLANR/L2525M12 | 25 | 25 | 150 | 20 | 25 | 30 | LNMX1204**R/L... |
| TLANR/L2525M16 | 25 | 25 | 150 | 25 | 25 | 30 | LNMX1606**R/L... |
| TLANR/L3232P16 | 32 | 32 | 170 | 35 | 32 | 37 | LNMX1606**R/L... |
| TLANR/L3232P24 | 32 | 32 | 170 | 35 | 32 | 38 | LNMX2410**R/L... |
| TLANR/L4040R16 | 40 | 40 | 200 | 35 | 40 | 47 | LNMX1606**R/L... |
| TLANR/L4040R24 | 40 | 40 | 200 | 40 | 40 | 47 | LNMX2410**R/L... |
| TLANR/L5050S24 | 50 | 50 | 250 | 40 | 50 | 57 | LNMX2410**R/L... |

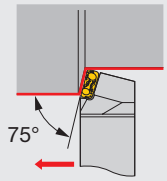
## SPARE PARTS

| Designation | Clamping screw | Shim screw | Shim | Spring | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|
| TLANR1616H12 | CSTB-3.5L115-S | CSTF-2L055-S | TSL12R | - | KEYV-T10 | T-6F-S |
| TLANL1616H12 | CSTB-3.5L115-S | CSTF-2L055-S | TSL12L | - | KEYV-T10 | T-6F-S |
| TLANR1616M12S | CSTB-3.5L115-S | CSTF-2L055-S | TSL12R | - | KEYV-T10 | T-6F-S |
| TLANL1616M12S | CSTB-3.5L115-S | CSTF-2L055-S | TSL12L | - | KEYV-T10 | T-6F-S |
| TLANR2020K12 | CSTB-3.5L115-S | CSTF-2L055-S | TSL12R | - | KEYV-T10 | T-6F-S |
| TLANL2020K12 | CSTB-3.5L115-S | CSTF-2L055-S | TSL12L | - | KEYV-T10 | T-6F-S |
| TLANR2020K16 | CSTB-4L115-S | - | TSL16R | PSP-16 | KEYV-T15 | - |
| TLANL2020K16 | CSTB-4L115-S | - | TSL16L | PSP-16 | KEYV-T15 | - |
| TLANR2525M12 | CSTB-3.5L115-S | CSTF-2L055-S | TSL12R | - | KEYV-T10 | T-6F-S |
| TLANL2525M12 | CSTB-3.5L115-S | CSTF-2L055-S | TSL12L | - | KEYV-T10 | T-6F-S |
| TLANR2525M16 | CSTB-4L115-S | - | TSL16R | PSP-16 | KEYV-T15 | - |
| TLANL2525M16 | CSTB-4L115-S | - | TSL16L | PSP-16 | KEYV-T15 | - |
| TLANR3232P16 | CSTB-4L115-S | - | TSL16R | PSP-16 | KEYV-T15 | - |
| TLANL3232P16 | CSTB-4L115-S | - | TSL16L | PSP-16 | KEYV-T15 | - |
| TLANR3232P24 | CSTB-5L163-S | - | TSL24R | SP 16-L14 | KEYV-T20 | - |
| TLANL3232P24 | CSTB-5L163-S | - | TSL24L | SP 16-L14 | KEYV-T20 | - |
| TLANR4040R16 | CSTB-4L115-S | - | TSL16R | PSP-16 | KEYV-T15 | - |
| TLANL4040R16 | CSTB-4L115-S | - | TSL16L | PSP-16 | KEYV-T15 | - |
| TLANR4040R24 | CSTB-5L163-S | - | TSL24R | SP 16-L14 | KEYV-T20 | - |
| TLANL4040R24 | CSTB-5L163-S | - | TSL24L | SP 16-L14 | KEYV-T20 | - |
| TLANR5050S24 | CSTB-5L163-S | - | TSL24R | SP 16-L14 | KEYV-T20 | - |
| TLANL5050S24 | CSTB-5L163-S | - | TSL24L | SP 16-L14 | KEYV-T20 | - |

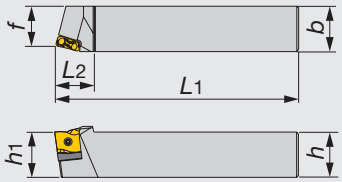
TLANR/L: Inserts → **B260**, Standard cutting conditions → **B261**

## TURNTEC TLBNR/L

Screw-on clamp toolholder for roughing operation with 75° approach angle, for negative tangential inserts




Cutting edge style **B**




Right hand (R) shown.

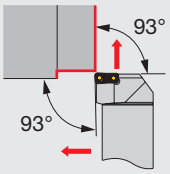
| Designation | *h* | *b* | $L_1$ | $L_2$ | $h_1$ | *f* | Insert |
|---|---|---|---|---|---|---|---|
| TLBNR/L4040R24 | 40 | 40 | 200 | 35 | 40 | 35 | LNMX2410**R/L... |

### SPARE PARTS

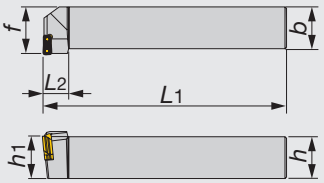
| Designation | Clamping screw | Shim | Spring pin | Wrench |
|---|---|---|---|---|
| TLBNR4040R24 | CSTB-5L163-S | TSL24R | PSP-16 | KEYV-T20 |
| TLBNL4040R24 | CSTB-5L163-S | TSL24L | PSP-16 | KEYV-T20 |

## TURNTEC TLFNR/L

Screw-on clamp toolholder for roughing operation with 93° approach angle, for negative tangential inserts




Cutting edge style **F**




Right hand (R) shown.

| Designation | *h* | *b* | $L_1$ | $L_2$ | $h_1$ | *f* | Insert |
|---|---|---|---|---|---|---|---|
| TLFNR/L2525M16 | 25 | 25 | 150 | 20 | 25 | 30 | LNMX1606**L/R... |
| TLFNR/L3232P16 | 32 | 32 | 170 | 20 | 32 | 37 | LNMX1606**L/R... |

Note: The right hand insert (R) is used for the left hand toolholders (TLFNL** type), and the left hand insert (L) is used for the right hand toolholders (TLFNR** type).

### SPARE PARTS

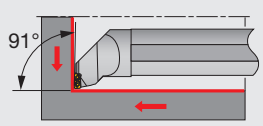
| Designation | Clamping screw | Shim | Spring pin | Wrench |
|---|---|---|---|---|
| TLFNR2525M16 | CSTB-4L115-S | TSL16L | PSP-16 | KEYV-T15 |
| TLFNL2525M16 | CSTB-4L115-S | TSL16R | PSP-16 | KEYV-T15 |
| TLFNR3232P16 | CSTB-4L115-S | TSL16L | PSP-16 | KEYV-T15 |
| TLFNL3232P16 | CSTB-4L115-S | TSL16R | PSP-16 | KEYV-T15 |

TLBNR/L, TLFNR/L: Inserts → **B260**, Standard cutting conditions → **B261**

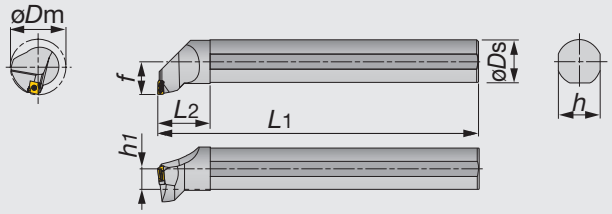
# S-TLANR/L

Screw-on clamp toolholder for roughing operation with 91° approach angle, for negative tangential inserts






Cutting edge style **A**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | h1 | Insert |
|---|---|---|---|---|---|---|---|---|---|
| S25T-TLANR/L12-D530 | Steel | 53 | 25 | 17 | 300 | 40 | 23 | 11.5 | LNMX1204**L/R... |
| S32U-TLANR/L12-D530 | Steel | 53 | 32 | 22 | 350 | 45 | 29 | 14.5 | LNMX1204**L/R... |
| S40V-TLANR/L12-D530 | Steel | 53 | 40 | 27 | 400 | 53 | 36 | 18 | LNMX1204**L/R... |
| S50U-TLANR/L16-D850 | Steel | 85 | 50 | 37 | 350 | 63 | 46 | 23 | LNMX1606**L/R... |

Note: The right hand insert (R) is used for the left hand toolholders (TLANL** type), and the left hand insert (L) is used for the right hand toolholders (TLANR** type).

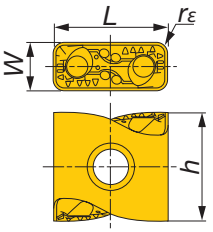
## SPARE PARTS

| Designation | Clamping screw | Shim screw | Shim | Spring pin | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|
| S**-TLANR/L12-D530 | CSTB-3.5L115-S | CSTF-2L055-S | TSL12L/RI | - | KEYV-T10 | T-6F-S |
| S50U-TLANR16-D850 | CSTB-4L115-S | - | TSL16LI | PSP-16 | KEYV-T15 | - |
| S50U-TLANL16-D850 | CSTB-4L115-S | - | TSL16RI | PSP-16 | KEYV-T15 | - |

## INSERT

### LNMX12/16/24






| Designation | rε | Coating | | | | | | W | L | h |
|---|---|---|---|---|---|---|---|---|---|---|
| | | T9115 | | T9125 | | AH725 | | | | |
| | | R | L | R | L | R | L | | | |
| LNMX120408R/L-TDR | 0.8 | ● | ● | ● | ● | | | 4.8 | 12 | 11.6 |
| LNMX120412R/L-TDR | 1.2 | ● | ● | ● | ● | | | 4.8 | 12 | 11.6 |
| LNMX160608R/L-TDR | 0.8 | ● | ● | ● | ● | | | 6.4 | 16.2 | 13.5 |
| LNMX160612R/L-TDR | 1.2 | ● | ● | ● | ● | | | 6.4 | 16.2 | 13.5 |
| LNMX160616R/L-TDR | 1.6 | ● | ● | ● | ● | | | 6.4 | 16.2 | 13.5 |
| LNMX241016R/L-TDR | 1.6 | ● | ● | ● | ● | | | 9.4 | 24 | 20.5 |
| LNMX241024R/L-TDR | 2.4 | ● | ● | ● | ● | | | 9.4 | 24 | 20.5 |
| LNMX160608R/L-MDR | 0.8 | ● | ● | | | ● | ● | 6.4 | 16.2 | 13.5 |
| LNMX160612R/L-MDR | 1.2 | ● | ● | | | ● | ● | 6.4 | 16.2 | 13.5 |
| LNMX160608R/L-TWR | 0.8 | ● | ● | ● | ● | | | 6.4 | 16.2 | 13.5 |
| LNMX160612R/L-TWR | 1.2 | ● | ● | ● | ● | | | 6.4 | 16.2 | 13.5 |

● : Line-up

S-TLANR/L: Inserts → **B260**, Standard cutting conditions → **B261**

# STANDARD CUTTING CONDITIONS

## LNMX1204

*** Values in red shows the condition for facing**

| ISO | Workpiece material | Chip-breaker | Grade | Cutting speed *Vc* (m/min) | Depth of cut: *ap* (mm) | | Feed: *f* (mm/rev) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | $r_\varepsilon$ : 0.8 | $r_\varepsilon$ : 1.2 | $r_\varepsilon$ : 0.8 | $r_\varepsilon$ : 1.2 |
| P | Steels C45, 18CrMo4, etc. | TDR | T9115 | 120 - 250 | 0.5 - 5<br>0.5 - 2.2 | 0.8 - 5<br>0.8 - 2.2 | 0.15 - 0.6 | 0.25 - 0.8 |
| | | TDR | T9125 | 80 - 180 | 0.5 - 5<br>0.5 - 2.2 | 0.8 - 5<br>0.8 - 2.2 | 0.15 - 0.6 | 0.25 - 0.8 |
| M | Stainless steels X5CrNi18-9, X5CrNiMo17-12-2, etc. | TDR | T9115 | 100 - 180 | 0.5 - 5<br>0.5 - 2.2 | 0.8 - 5<br>0.8 - 2.2 | 0.15 - 0.6 | 0.25 - 0.8 |
| | | TDR | T9125 | 80 - 180 | 0.5 - 5<br>0.5 - 2.2 | 0.8 - 5<br>0.8 - 2.2 | 0.15 - 0.6 | 0.25 - 0.8 |

## LNMX1606

| ISO | Workpiece material | Chip-breaker | Grade | Cutting speed *Vc* (m/min) | Depth of cut: *ap* (mm) | | | Feed: *f* (mm/rev) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | $r_\varepsilon$ : 0.8 | $r_\varepsilon$ : 1.2 | $r_\varepsilon$ : 1.6 | $r_\varepsilon$ : 0.8 | $r_\varepsilon$ : 1.2 | $r_\varepsilon$ : 1.6 |
| P | Steels C45, 18CrMo4, etc. | TDR | T9115 | 120 - 250 | 0.5 - 5<br>0.5 - 3.2 | 0.8 - 6<br>0.8 - 3.2 | 1 - 8<br>1 - 3.2 | 0.15 - 0.6 | 0.25 - 0.8 | 0.3 - 1 |
| | | TDR | T9125 | 80 - 180 | 0.5 - 5<br>0.5 - 3.2 | 0.8 - 6<br>0.8 - 3.2 | 1 - 8<br>1 - 3.2 | 0.15 - 0.6 | 0.25 - 0.8 | 0.3 - 1 |
| | | TWR | T9115 | 120 - 250 | 1 - 8<br>1 - 3.2 | 0.8 - 6<br>0.8 - 3.2 | - | 0.15 - 0.6 | 0.25 - 0.8 | - |
| | | TWR | T9125 | 80 - 180 | 1 - 8<br>1 - 3.2 | 0.8 - 6<br>0.8 - 3.2 | - | 0.15 - 0.6 | 0.25 - 0.8 | - |
| M | Stainless steels X5CrNi18-9, X5CrNiMo17-12-2, etc. | TDR | T9115 | 100 - 180 | 0.5 - 5<br>0.5 - 3.2 | 0.8 - 6<br>0.8 - 3.2 | 1 - 8<br>1 - 3.2 | 0.15 - 0.6 | 0.25 - 0.8 | 0.3 - 1 |
| | | TDR | T9125 | 80 - 180 | 0.5 - 5<br>0.5 - 3.2 | 0.8 - 6<br>0.8 - 3.2 | 1 - 8<br>1 - 3.2 | 0.15 - 0.6 | 0.25 - 0.8 | 0.3 - 1 |
| | | MDR | T9115 | 100 - 150 | 1.5 - 6<br>0.5 - 3.2 | 1.5 - 7<br>0.8 - 3.2 | - | 0.1 - 0.5 | 0.15 - 0.7 | - |
| | | MDR | AH725 | 50 - 150 | 1.5 - 6<br>0.5 - 3.2 | 1.5 - 7<br>0.8 - 3.2 | - | 0.1 - 0.5 | 0.15 - 0.7 | - |
| | | TWR | T9115 | 100 - 180 | 0.5 - 5<br>0.5 - 3.2 | 0.8 - 6<br>0.8 - 3.2 | - | 0.15 - 0.6 | 0.25 - 0.8 | - |
| | | TWR | T9125 | 80 - 180 | 0.5 - 5<br>0.5 - 3.2 | 0.8 - 6<br>0.8 - 3.2 | - | 0.15 - 0.6 | 0.25 - 0.8 | - |

## LNMX2410

| ISO | Workpiece material | Chip-breaker | Grade | Cutting speed *Vc* (m/min) | Depth of cut: *ap* (mm) | | Feed: *f* (mm/rev) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | $r_\varepsilon$ : 1.6 | $r_\varepsilon$ : 2.4 | $r_\varepsilon$ : 1.6 | $r_\varepsilon$ : 2.4 |
| P | Steels C45, 18CrMo4, etc. | TDR | T9115 | 120 - 250 | 4 - 15<br>1 - 4.5 | 5 - 15<br>1 - 4.5 | 0.3 - 1 | 0.3 - 1.1 |
| | | TDR | T9125 | 80 - 150 | 4 - 15<br>1 - 4.5 | 5 - 15<br>1 - 4.5 | 0.3 - 1 | 0.3 - 1.1 |
| M | Stainless steels X5CrNi18-9, X5CrNiMo17-12-2, etc. | TDR | T9115 | 100 - 180 | 4 - 15<br>1 - 4.5 | 5 - 15<br>1 - 4.5 | 0.3 - 1 | 0.3 - 1.1 |
| | | TDR | T9125 | 80 - 150 | 4 - 15<br>1 - 4.5 | 5 - 15<br>1 - 4.5 | 0.3 - 1 | 0.3 - 1.1 |



## MINIFORCE TURN

Economical double-sided inserts with excellent sharpness

Shank ø10 - 25 mm

B268



## ISOECO TURN

Small-sized “Eco” insert series for maximized profits

Shank ø16 - 32 mm

B274

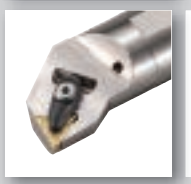


## STREAMJETBAR

Highly rigid toolholders providing good chip evacuation

Shank ø4 - 50 mm

B278



## TURNINGA

Highly rigid clamping system with excellent repeatability

Shank ø25 - 50 mm

B297



## Y-PRO SERIES

Inserts with 25° corner angle for profiling

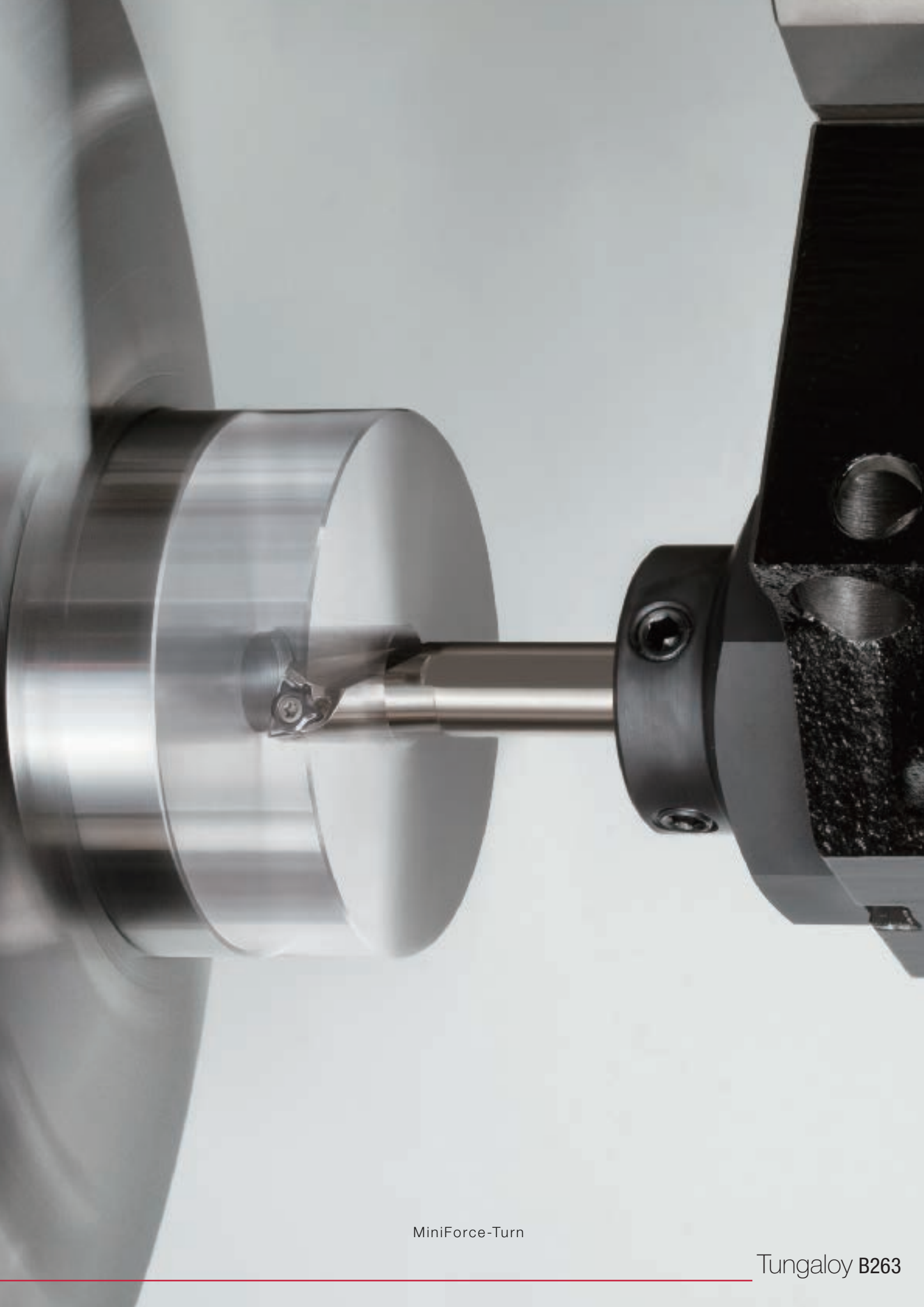
Shank ø12 - 16 mm

B300

## ISO-Turn Internal

Toolholders for general internal turning

B301

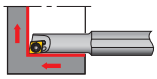
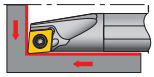
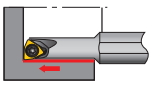
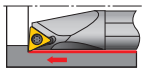
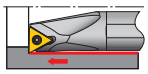
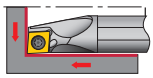
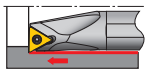
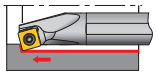
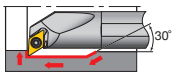
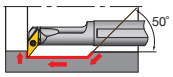
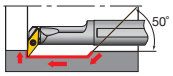
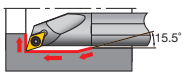
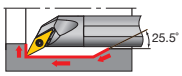
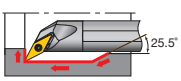


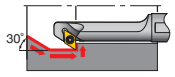
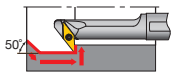
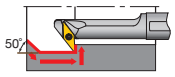
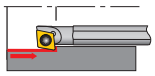
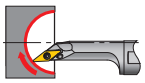
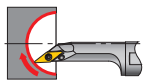
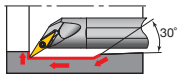
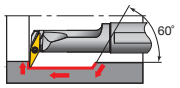
MiniForce-Turn

# Internal Toolholder - Quick Guide

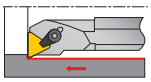
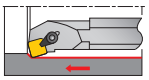


## Positive type

| Style | StreamJet-Bar Description & Application | ISO Insert | Y-Pro | Shank Type | Shank Ø | Min. bore diameter (mm) 0 10 20 30 40 50 | |
|---|---|---|---|---|---|---|---|
|  | **SEXPR/L**<br>Boring & internal facing<br>Insert type: EP□□ | ✓ | | Steel<br>Carbide | ø4 - ø8<br>ø4 - ø8 | ø4.5 ø7<br>ø4.5 ø7 | B279<br>B281 |
|  | **SCLCR/L**<br>Boring & internal facing<br>Insert type: CC□□ | ✓ | | Steel<br>Carbide<br>Reinforced | ø4 - ø25<br>ø4 - ø25<br>ø12 - ø25 | ø5 ø27<br>ø5 ø27<br>ø16 ø32 | B278<br>B301 |
|  | **SWUBR/L**<br>Boring<br>Insert type: WB□□ | ✓ | | Steel<br>Carbide | ø5 - ø8<br>ø5 - ø8 | ø6 ø8<br>ø6 ø8 | B286 |
|  | **STUPR/L**<br>Boring<br>Insert type: TP□□ | ✓ | | Steel<br>Carbide<br>Reinforced | ø7 - ø32<br>ø7 - ø25<br>ø12 - ø25 | ø8 ø34<br>ø8 ø27<br>ø14 ø31 | B285<br>B302 |
|  | **STFPR/L**<br>Blind hole boring<br>Insert type: TP□□ | ✓ | | Steel<br>Carbide | ø8 - ø25<br>ø8 - ø20 | ø10 ø27<br>ø10 ø22 | B284 |
|  | **SCLPR/L**<br>Boring & internal facing<br>Insert type: CP□□ | ✓ | | Steel<br>Carbide<br>Reinforced | ø8 - ø25<br>ø8 - ø16<br>ø12 - ø25 | ø10 ø27<br>ø10 ø20<br>ø14 ø32 | B280<br>B301 |
|  | **STFCR/L**<br>Blind hole boring<br>Insert type: TC□□ | ✓ | | Steel<br>Carbide | ø10 - ø16<br>ø10 - ø16 | ø12 ø18<br>ø12 ø18 | B283 |
|  | **SSKPR/L**<br>Through boring<br>Insert type: SP□□ | ✓ | | Steel | ø16 - ø25 | ø20 ø31 | B282 |
|  | **SDUCR/L**<br>Boring & internal profiling<br>Insert type: DC□□ | ✓ | | Steel<br>Carbide | ø10 - ø25<br>ø10 - ø20 | ø13 ø32<br>ø13 ø27 | B287 |
|  | **SVUCR/L**<br>Boring & internal profiling<br>Insert type: VC□□ | ✓ | | Steel<br>Carbide<br>Reinforced | ø12 - ø25<br>ø12 - ø25<br>ø25 | ø16 ø32<br>ø18 ø32<br>ø32 | B288<br>B303 |
|  | **SVUBR/L**<br>Boring & internal profiling<br>Insert type: VB□□ | ✓ | | Steel<br>Carbide<br>Reinforced | ø16 - ø25<br>ø16 - ø25<br>ø20 | ø20 ø32<br>ø24.5 ø34<br>ø25 | B287<br>B303 |
|  | **SDQCR/L**<br>Boring & internal profiling<br>Insert type: DC□□ | ✓ | | Steel<br>Carbide<br>Reinforced | ø10 - ø25<br>ø10 - ø20<br>ø16 - ø25 | ø13 ø30<br>ø13 ø25<br>ø20 ø32 | B288<br>B303 |
|  | **SVQCR/L**<br>Boring & internal profiling<br>Insert type: VC□□ | ✓ | | Steel<br>Carbide<br>Reinforced | ø10 - ø16<br>ø10 - ø16<br>ø25 | ø13.5 ø21.5<br>ø13.5 ø21.5<br>ø32 | B289<br>B304 |
|  | **SVQBR/L**<br>Boring & internal profiling<br>Insert type: VB□□ | ✓ | | Steel<br>Carbide<br>Reinforced | ø12 - ø25<br>ø12 - ø25<br>ø20 | ø17 ø30.5<br>ø17 ø30.5<br>ø25 | B289<br>B304 |

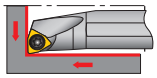
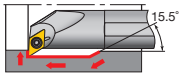
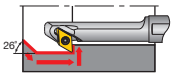
| Style | StreamJet-Bar Description & Application | ISO Insert | Y-Pro | Shank Type | Shank Ø | Min. bore diameter (mm) 0 10 20 30 40 50 | |
|---|---|---|---|---|---|---|---|
|  | **SDZCR/L**<br>Internal retracting<br>Insert type: DC□□ | ✓ | | Steel<br>Carbide | ø12 - ø25<br>ø12 - ø16 | ø14 ø25<br>ø18 ø22 | B290 |
|  | **SVZCR/L**<br>Internal retracting<br>Insert type: VC□□ | ✓ | | Steel | ø12 | ø16 | B291 |
|  | **SVZBR/L**<br>Internal retracting<br>Insert type: VB□□ | ✓ | | Steel | ø16 - ø32 | ø20 ø40 | B291 |
|  | **SEZPR/L**<br>Internal retracting<br>Insert type: EP□□ | ✓ | | Steel<br>Carbide | ø4 - ø5<br>ø4 - ø5 | ø5.5 ø6.5<br>ø5.5 ø6.5 | B292 |
|  | **SVJCR/L**<br>Internal sphere cutting<br>Insert type: VC□□ | ✓ | | Steel | ø12 - ø16 | ø16 ø20 | B282 |
|  | **SVJBR/L**<br>Internal sphere cutting<br>Insert type: VB□□ | ✓ | | Steel | ø20 - ø25 | ø25 ø30 | B282 |
|  | **SYQBR/L**<br>Internal undercut & profiling<br>Insert type: YW□□ | | ✓ | Steel<br>Carbide | ø12 - ø16<br>ø12 - ø16 | ø17 ø21.5<br>ø17 ø21.5 | B300 |
|  | **SYUBR/L**<br>Boring & internal profiling<br>Insert type: YW□□ | | ✓ | Steel<br>Carbide | ø16<br>ø12 - ø16 | ø20<br>ø20 ø24.5 | B300 |

## Clamp-on

| Style | Description & Aplication | ISO insert | Shank Type | Shank Ø | Min. bore diameter (mm) 0 10 20 30 40 50 | |
|---|---|---|---|---|---|---|
|  | **CTFPR/L**<br>Blind hole boring<br>Insert type: TP□□ (Without hole) | ✓ | Steel<br>Carbide | ø12 - ø32<br>ø12 - ø16 | ø16 ø40<br>ø16 ø20 | B305 |
|  | **CSKPR/L**<br>Through boring<br>Insert type: SP□□ (Without hole) | ✓ | Steel | ø16 - ø25 | ø20 ø32 | B305 |

# Internal Toolholder - Quick Guide

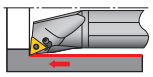
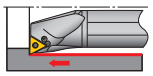
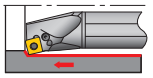
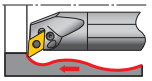
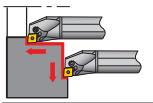
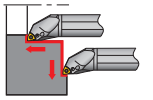
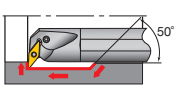
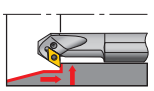
**MiniForce-Turn -** Double-sided insert with positive cutting edges

| Style | MiniForce-Turn Description & Application | MiniForce -Turn | Shank Type | Shank Ø | Min. bore diameter (mm) 0 10 20 30 40 50 | |
|---|---|---|---|---|---|---|
|  | **SWLXR/L**<br>Boring & facing<br>Insert type: WXGU | ✓ | Steel<br>Carbide | ø10 - ø20<br>ø10 - ø20 | ø12 ø22<br>ø12 ø22 | B268 |
|  | **SDXXR/L**<br>Internal profiling<br>Insert type: DXGU | ✓ | Steel<br>Carbide | ø10 - ø20<br>ø10 - ø20 | ø13 ø24<br>ø13 ø24 | B268 |
|  | **SDZXR/L**<br>Internal retracting<br>Insert type: DXGU | ✓ | Steel<br>Carbide | ø12 - ø20<br>ø12 - ø16 | ø14 ø20<br>ø18 ø22 | B269 |

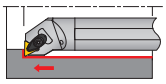
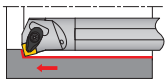
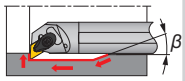
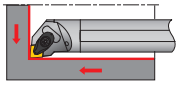
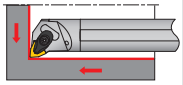
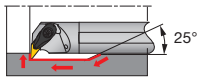
# Internal Toolholder - Quick Guide

## Negative type

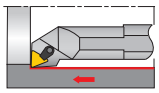
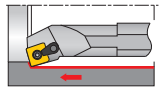
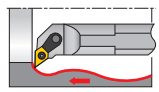
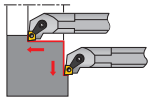
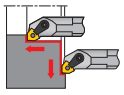
### Lever-lock

| Style | StreamJet-Bar Description & Application | ISO insert | ISO-EcoTurn | Shank Type | Shank Ø | Min. bore diameter (mm) 20 30 40 50 60 70 | |
|---|---|---|---|---|---|---|---|
|  | **PTUNR/L**<br>Boring<br>Insert type: TN□□ | ✓ | ✓ | Steel<br>Reinforced | ø16 - ø32<br>ø16 - ø50 | ø20 ø40<br>ø20 ø63 | B277<br>B295<br>B309<br>B310 |
|  | **PTFNR/L**<br>Boring<br>Insert type: TN□□ | ✓ | ✓ | Steel | ø25 - ø50 | ø32 ø63 | B276<br>B294<br>B308 |
|  | **PSKNR/L**<br>Through boring<br>Insert type: SN□□ | ✓ | | Steel | ø32 - ø50 | ø40 ø63 | B293<br>B307 |
|  | **PDUNR/L**<br>Internal profiling<br>Insert type: DN□□ | ✓ | ✓ | Steel<br>Reinforced | ø20 - ø50<br>ø32 - ø50 | ø25 ø63<br>ø40 ø63 | B276<br>B295<br>B308<br>B309 |
|  | **PCLNR/L**<br>Boring & internal facing<br>Insert type: CN□□ | ✓ | ✓ | Steel<br>Reinforced | ø16 - ø50<br>ø16 - ø50 | ø20 ø63<br>ø20 ø63 | B274<br>B292<br>B306 |
|  | **PWLNR/L**<br>Boring & facing<br>Insert type: WN□□ | ✓ | ✓ | Steel | ø16 - ø40 | ø20 ø50 | B275<br>B293<br>B307 |
|  | **PVUNR/L**<br>Boring & internal profiling<br>Insert type: VN□□ | ✓ | | Steel | ø25 - ø40 | ø37 ø50 | B296 |
|  | **PDZNR/L**<br>Internal retracting<br>Insert type: DN□□ | ✓ | | Steel | ø32 - ø50 | ø40 ø63 | B296<br>B310 |

## Double-clamp

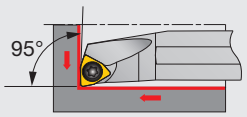
| Style | Turning A<br>Description & Application | ISO insert | ISO-EcoTurn | Shank Type | Shank Ø | Min. bore diameter (mm)<br>20 30 40 50 60 70 | |
|---|---|---|---|---|---|---|---|
|  | **ATFNR/L**<br>Boring<br>Insert type: TN□□ | ✓ | | Steel | ø25 - ø32 | ø32 ø40 | B298 |
|  | **ASKNR/L**<br>Boring<br>Insert type: SN□□ | ✓ | | Steel | ø25 - ø32 | ø32 ø40 | B298 |
|  | **ADUNR/L**<br>Boring & internal profiling<br>Insert type: DN□□ | ✓ | ✓ | Steel | ø25 - ø50 | ø32 ø63 | B276<br>B299 |
|  | **ACLNR/L**<br>Boring & internal facing<br>Insert type: CN□□ | ✓ | ✓ | Steel | ø25 - ø50 | ø32 ø63 | B274<br>B297 |
|  | **AWLNR/L**<br>Boring & internal facing<br>Insert type: WN□□ | ✓ | ✓ | Steel | ø25 - ø50 | ø32 ø63 | B275<br>B297 |
|  | **AVUNR/L**<br>Boring & internal profiling<br>Insert type: VN□□ | ✓ | | Steel | ø32 - ø40 | ø40 ø50 | B299 |

## Multi-clamp

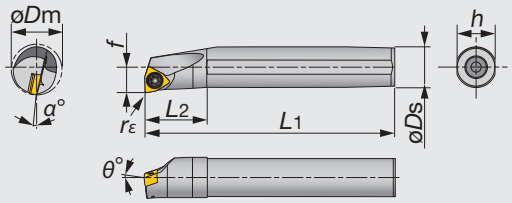
| Style | Description & Application | ISO insert | Shank Type | Shank Ø | Min. bore diameter (mm)<br>20 30 40 50 60 70 | |
|---|---|---|---|---|---|---|
|  | **MTFNR/L**<br>Boring<br>Insert type: TN□□ | ✓ | Steel | ø25 | ø32 | B312 |
|  | **MSKNR/L**<br>Through boring<br>Insert type: SN□□ | ✓ | Steel | ø25 | ø32 | B312 |
|  | **MDUNR/L**<br>Boring & internal profiling<br>Insert type: DN□□ | ✓ | Steel | ø25 | ø32 | B313 |
|  | **MCLNR/L**<br>Boring & internal facing<br>Insert type: CN□□ | ✓ | Steel | ø25 | ø32 | B311 |
|  | **MWLNR/L**<br>Boring & internal facing<br>Insert type: WN□□ | ✓ | Steel | ø25 - ø50 | ø32 ø70 | B311 |

## MINIFORCE TURN
## A/E-SWLXR/L

For trigon insert with 6 edges




Cutting edge style **L**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A10K-SWLXR/L04-D120 | STEEL | 12 | 10 | 6 | 125 | 20 | 9 | -10 | -16 | 0.4 | WXGU0403**L/R... | 0.9 |
| A12M-SWLXR/L04-D140 | STEEL | 14 | 12 | 7 | 150 | 24 | 11 | -10 | -14 | 0.4 | WXGU0403**L/R... | 0.9 |
| A16Q-SWLXR/L04-D180 | STEEL | 18 | 16 | 9 | 180 | 32 | 15 | -10 | -11 | 0.4 | WXGU0403**L/R... | 0.9 |
| A20R-SWLXR/L04-D220 | STEEL | 22 | 20 | 11 | 200 | 36 | 18 | -10 | -10 | 0.4 | WXGU0403**L/R... | 0.9 |
| E10M-SWLXR/L04-D120 | CARBIDE | 12 | 10 | 6 | 150 | 25 | 9 | -10 | -16 | 0.4 | WXGU0403**L/R... | 0.9 |
| E12Q-SWLXR/L04-D140 | CARBIDE | 14 | 12 | 7 | 180 | 27 | 11 | -10 | -14 | 0.4 | WXGU0403**L/R... | 0.9 |
| E16R-SWLXR/L04-D180 | CARBIDE | 18 | 16 | 9 | 200 | 32 | 15 | -10 | -11 | 0.4 | WXGU0403**L/R... | 0.9 |
| E20S-SWLXR/L04-D220 | CARBIDE | 22 | 20 | 11 | 250 | 36 | 18 | -10 | -10 | 0.4 | WXGU0403**L/R... | 0.9 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: Right hand toolholders (R) are used with left hand inserts (L) Left hand toolholders (L) are used with right hand inserts (R)

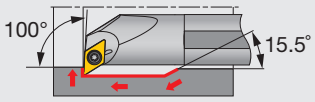
### SPARE PARTS



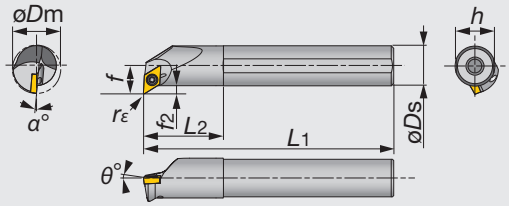

| Designation | Clamping screw | Wrench |
|---|---|---|
| A/E**-SWLXR/L... | SR34-514 | T-7F |

## MINIFORCE TURN
## A/E-SDXXR/L

For 55° rhombic insert with 4 edges




Cutting edge style **X**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A10K-SDXXR/L07-D130 | STEEL | 13 | 10 | 7.6 | 125 | 20 | 9 | 2.6 | -14 | -16 | 0.4 | DXGU0703**L/R... | 0.9 |
| A12M-SDXXR/L07-D160 | STEEL | 16 | 12 | 8.6 | 150 | 24 | 11 | 2.6 | -14 | -14 | 0.4 | DXGU0703**L/R... | 0.9 |
| A16Q-SDXXR/L07-D200 | STEEL | 20 | 16 | 10.6 | 180 | 32 | 15 | 2.6 | -13 | -13 | 0.4 | DXGU0703**L/R... | 0.9 |
| A20R-SDXXR/L07-D240 | STEEL | 24 | 20 | 12.6 | 200 | 36 | 18 | 2.6 | -13 | -12 | 0.4 | DXGU0703**L/R... | 0.9 |
| E10M-SDXXR/L07-D130 | CARBIDE | 13 | 10 | 7.6 | 150 | 25 | 9 | 2.6 | -14 | -16 | 0.4 | DXGU0703**L/R... | 0.9 |
| E12Q-SDXXR/L07-D160 | CARBIDE | 16 | 12 | 8.6 | 180 | 27 | 11 | 2.6 | -14 | -14 | 0.4 | DXGU0703**L/R... | 0.9 |
| E16R-SDXXR/L07-D200 | CARBIDE | 20 | 16 | 10.6 | 200 | 32 | 15 | 2.6 | -13 | -13 | 0.4 | DXGU0703**L/R... | 0.9 |
| E20S-SDXXR/L07-D240 | CARBIDE | 24 | 20 | 12.6 | 250 | 36 | 18 | 2.6 | -13 | -12 | 0.4 | DXGU0703**L/R... | 0.9 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: Right hand toolholders (R) are used with left hand inserts (L) Left hand toolholders (L) are used with right hand inserts (R)

### SPARE PARTS



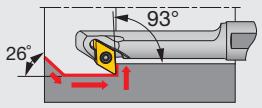

| Designation | Clamping screw | Wrench |
|---|---|---|
| A/E**-SDXXR/L... | SR34-514 | T-7F |

A/E-SWLXR/L: Inserts → **B270**, Standard cutting conditions → **B273**

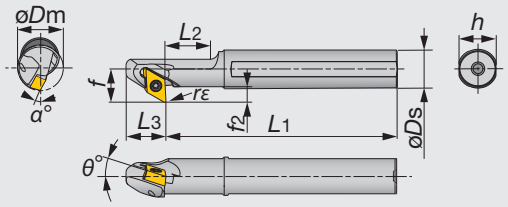
A/E-SDXXR/L: Inserts → **B271 -**, Standard cutting conditions → **B273**

# A/E-SDZXR/L

For 55° rhombic insert with 4 edges




Cutting edge style **Z**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | L3 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A12M-SDZXR/L07-D140 | STEEL | 14 | 12 | 11 | 150 | 30 | 13 | 11 | 4.5 | -10 | -14 | 0.4 | DXGU0703**R/L... | 0.9 |
| A16Q-SDZXR/L07-D160 | STEEL | 16 | 16 | 13 | 180 | 35 | 13 | 15 | 4.5 | -10 | -12.5 | 0.4 | DXGU0703**R/L... | 0.9 |
| A20R-SDZXR/L07-D200 | STEEL | 20 | 20 | 15 | 200 | 40 | 13 | 18 | 4.5 | -10 | -10.5 | 0.4 | DXGU0703**R/L... | 0.9 |
| E12Q-SDZXR/L07-D180 | CARBIDE | 18 | 12 | 11 | 180 | - | 13 | 11 | 4.5 | -11 | -11 | 0.4 | DXGU0703**R/L... | 0.9 |
| E16R-SDZXR/L07-D220 | CARBIDE | 22 | 16 | 13 | 200 | - | 13 | 15 | 4.5 | -11 | -9 | 0.4 | DXGU0703**R/L... | 0.9 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: Right hand toolholders (R) are used with right hand inserts (R) Left hand toolholders (L) are used with left hand inserts (L)

## SPARE PARTS




| Designation | Clamping screw | Wrench |
|---|---|---|
| A/E**-SDZXR/L... | SR34-514 | T-7F |



A/E-SDXXR/L: Inserts → **B271 -**, Standard cutting conditions → **B273**

● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

## INSERT



**Trigon, 80° with hole**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ◐ | ●◐ | | | | | ●◐ | | | | | | ●◐ | | | | | | | | | | | | | | | | | | | | |
| M | Stainless | ◐ | ●◐ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| K | Cast iron | ◐ | | | | | | ●◐ | | | | | | ●◐ | | | | | | ● | | | | | | | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | | ● | | | | | | | | | | | | | |
| S | Superalloys | ● | | | | | | | | | | | | | | | | | | ● | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | Coating | | Coated cermet | Cermet | Uncoated |
|---|---|---|---|---|---|---|---|---|
| | | | | AH725 | SH725 | GT9530 | NS9530 | KS05F |
| Finishing to medium cutting (Sharp edge) | JTS | WXGU040301MFR-JTS | <0.1* | | ● | | | |
| | | WXGU040301MFL-JTS | <0.1* | | ● | | | |
| | | WXGU040302MFR-JTS | <0.2* | | ● | | | |
| | | WXGU040302MFL-JTS | <0.2* | | ● | | | |
| Finishing to medium cutting | JTS | WXGU040301MR-JTS | <0.1* | ● | | | | |
| | | WXGU040301ML-JTS | <0.1* | ● | | | | |
| | | WXGU040302MR-JTS | <0.2* | ● | | | | |
| | | WXGU040302ML-JTS | <0.2* | ● | | | | |
| Finishing (Low cutting force) (Sharp edge) | JSS | WXGU040301MFR-JSS | <0.1* | | ● | | | |
| | | WXGU040301MFL-JSS | <0.1* | | ● | | | |
| | | WXGU040302MFR-JSS | <0.2* | | ● | | | |
| | | WXGU040302MFL-JSS | <0.2* | | ● | | | |
| Finishing (Low cutting force) | JSS | WXGU040301MR-JSS | <0.1* | ● | | | | |
| | | WXGU040301ML-JSS | <0.1* | ● | | | | |
| | | WXGU040302MR-JSS | <0.2* | ● | | | | |
| | | WXGU040302ML-JSS | <0.2* | ● | | | | |
| Finishing to medium cutting | TS | WXGU040302R-TS | 0.2 | ● | | ● | ● | ● |
| | | WXGU040302L-TS | 0.2 | ● | | ● | ● | ● |
| | | WXGU040304R-TS | 0.4 | ● | | ● | ● | ● |
| | | WXGU040304L-TS | 0.4 | ● | | ● | ● | ● |
| | | WXGU040308R-TS | 0.8 | ● | | ● | ● | ● |
| | | WXGU040308L-TS | 0.8 | ● | | ● | ● | ● |
| Finishing (Wiper) | TSW | WXGU040304R-TSW | 0.4 | ● | | ● | ● | |
| | | WXGU040304L-TSW | 0.4 | ● | | ● | ● | |
| | | WXGU040308R-TSW | 0.8 | ● | | ● | ● | |
| | | WXGU040308L-TSW | 0.8 | ● | | ● | ● | |
| Finishing (Low cutting force) | SS | WXGU040302R-SS | 0.2 | ● | | ● | ● | ● |
| | | WXGU040302L-SS | 0.2 | ● | | ● | ● | ● |
| | | WXGU040304R-SS | 0.4 | ● | | ● | ● | ● |
| | | WXGU040304L-SS | 0.4 | ● | | ● | ● | ● |

* Corner radius has minus tolerance

● : Line-up

● : Continuous cutting
ɔ : Light interrupted cutting
✤ : Heavy interrupted cutting



**Rhombic, 55° with hole**

| | | | |
|---|---|---|---|
| P | Steel | ɔ | ●ɔ |
| M | Stainless | ɔ | ●ɔ |
| K | Cast iron | ɔ | |
| N | Non-ferrous | | |
| S | Superalloys | ● | |
| H | Hard materials | | |

| Application | Chipbreaker | Designation | Corner radius | Coating: AH725 | Coating: SH725 |
|---|---|---|---|---|---|
| Finishing (sharp edge) | JRP | DXGU070301MFRE-JRP | <0.1* | | ● |
| | | DXGU070301MFLE-JRP | <0.1* | | ● |
| | | DXGU070302MFRE-JRP | <0.2* | | ● |
| | | DXGU070302MFLE-JRP | <0.2* | | ● |
| Finishing to medium cutting(sharp edge) | JTS | DXGU070301MFR-JTS | <0.1* | | ● |
| | | DXGU070301MFL-JTS | <0.1* | | ● |
| | | DXGU070302MFR-JTS | <0.2* | | ● |
| | | DXGU070302MFL-JTS | <0.2* | | ● |
| Finishing to medium cutting | JTS | DXGU070301MR-JTS | <0.1* | ● | |
| | | DXGU070301ML-JTS | <0.1* | ● | |
| | | DXGU070302MR-JTS | <0.2* | ● | |
| | | DXGU070302ML-JTS | <0.2* | ● | |
| Finishing (Low cutting force)(sharp edge) | JSS | DXGU070301MFR-JSS | <0.1* | | ● |
| | | DXGU070301MFL-JSS | <0.1* | | ● |
| | | DXGU070302MFR-JSS | <0.2* | | ● |
| | | DXGU070302MFL-JSS | <0.2* | | ● |

* Corner radius has minus tolerance

● : Line-up

● : Continuous cutting
ɔ : Light interrupted cutting
✠ : Heavy interrupted cutting

## INSERT

### Rhombic, 55° with hole

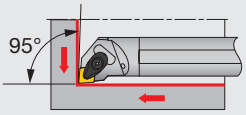
| | | |

## STANDARD CUTTING CONDITIONS
FOR INTERNAL TURNING

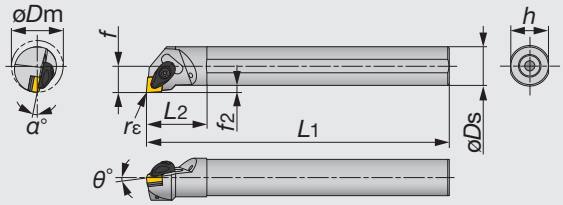
| ISO | Workpiece material | Grade | | | Cutting speed *Vc* (m/min) | Depth of cut *ap* (mm) | Feed *f* (mm/rev) |
|---|---|---|---|---|---|---|---|
| | | First Choice | For surface finish | For wear resistance (High speed) | | | |
| P | Low carbon steel E275A, C25, etc. | AH725 | - | - | 50 - 180 | 0.3 - 2 | 0.08 - 0.3 |
| | | - | NS9530 | - | 80 - 250 | 0.3 - 2 | 0.08 - 0.3 |
| | | - | - | GT9530 | 80 - 300 | 0.3 - 2 | 0.08 - 0.3 |
| | Carbon steel C45, C55, etc. | AH725 | - | - | 50 - 180 | 0.3 - 2 | 0.08 - 0.3 |
| | | - | NS9530 | - | 80 - 250 | 0.3 - 2 | 0.08 - 0.3 |
| | | - | - | GT9530 | 80 - 300 | 0.3 - 2 | 0.08 - 0.3 |
| | Low alloy steel 18CrMo4, etc. | AH725 | - | - | 50 - 180 | 0.3 - 2 | 0.08 - 0.3 |
| | | - | NS9530 | - | 80 - 250 | 0.3 - 2 | 0.08 - 0.3 |
| | | - | - | GT9530 | 80 - 300 | 0.3 - 2 | 0.08 - 0.3 |
| | Alloy steel 42CrMo4, 20Cr4, etc. | AH725 | - | - | 50 - 180 | 0.3 - 2 | 0.08 - 0.3 |
| | | - | NS9530 | - | 80 - 250 | 0.3 - 2 | 0.08 - 0.3 |
| | | - | - | GT9530 | 80 - 300 | 0.3 - 2 | 0.08 - 0.3 |
| M | Stainless steel (Austenitic) X5CrNi18-9, X5CrNiMo17-12-3, etc. | AH725 | - | - | 50 - 150 | 0.3 - 2 | 0.08 - 0.3 |
| | Stainless steel (Martensitic and ferritic) X6Cr17, X20Cr13, etc. | AH725 | - | - | 50 - 150 | 0.3 - 2 | 0.08 - 0.3 |
| | Stainless steel (Precipitation hardening) X5CrNiCuNb16-4, etc. | AH725 | - | - | 50 - 150 | 0.3 - 2 | 0.08 - 0.3 |
| K | Grey cast iron 250, etc. | AH725 | - | - | 50 - 180 | 0.3 - 2 | 0.08 - 0.3 |
| | | - | NS9530 | - | 80 - 250 | 0.3 - 2 | 0.08 - 0.3 |
| | | - | - | GT9530 | 80 - 300 | 0.3 - 2 | 0.08 - 0.3 |
| | Ductile cast iron 600-3, etc. | AH725 | - | - | 50 - 120 | 0.3 - 2 | 0.08 - 0.3 |
| | | - | NS9530 | - | 80 - 150 | 0.3 - 2 | 0.08 - 0.3 |
| | | - | - | GT9530 | 80 - 180 | 0.3 - 2 | 0.08 - 0.3 |
| N | Non ferrous Metal Aluminum alloy, etc. | KS05F | - | - | 100 - 300 | 0.3 - 2 | 0.08 - 0.3 |
| | Non ferrous Metal Copper Alloy, etc. | KS05F | - | - | 100 - 300 | 0.3 - 2 | 0.08 - 0.3 |

## ISOETURN A-ACLNR/L-Eco

Double-clamp boring bar, for negative 80° rhombic inserts




Cutting edge style **L**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A25R-ACLNR/L0904-D320 | STEEL | 32 | 25 | 17 | 200 | 45 | 23 | 4 | -6 | -13 | 0.8 | CN**0904... | 3 |
| A32S-ACLNR/L0904-D400 | STEEL | 40 | 32 | 22 | 250 | 50 | 30 | 6 | -6 | -10 | 0.8 | CN**0904... | 3 |

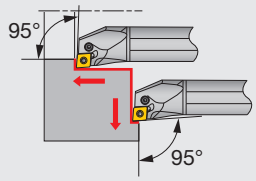
*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius

**SPARE PARTS**

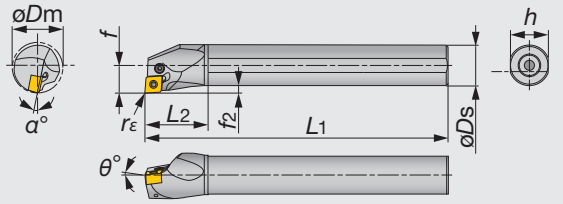
| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|---|---|
| A**-ACLNR/L0904... | ACP3S-E | ACS-5W | BP-7 | SP-2.5 | ASC322 | CSTB-3.5 | T-15F |

## ISOETURN A-PCLNR/L-Eco

Lever clamp boring bars, for negative 80° rhombic inserts




Cutting edge style **L**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A16M-PCLNR/L0904-D200 | STEEL | 20 | 16 | 11 | 150 | 32 | 15 | 3 | -6 | -16 | 0.8 | CN**0904... | 1.7 |
| A20Q-PCLNR/L0904-D250 | STEEL | 25 | 20 | 13 | 180 | 36 | 18 | 3 | -6 | -12 | 0.8 | CN**0904... | 1.7 |

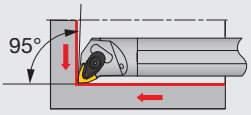
*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius

**SPARE PARTS**

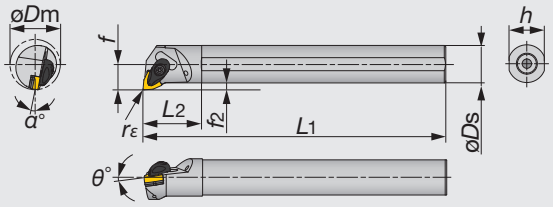
| Designation | Clamping screw | Wrench | Lever | Oil supply attachment | Screw for oil hole |
|---|---|---|---|---|---|
| A16M-PCLNR/L0904-D200 | LCS33 | P-2F | LCL33N | - | SSHM3-4 |
| A20Q-PCLNR/L0904-D250 | LCS33 | P-2F | LCL33N | EA20 | SSHM3-4 |

A-ACLNR/L-Eco, A-PCLNR/L-Eco: Inserts → **B050 -**

## Double-clamp boring bars, for negative trigon inserts




Cutting edge style **L**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A25R-AWLNR/L0604-D320 | STEEL | 32 | 25 | 17 | 200 | 45 | 23 | 4.5 | -6 | -13 | 0.8 | WN**0604... | 3 |
| A32S-AWLNR/L0604-D400 | STEEL | 40 | 32 | 22 | 250 | 50 | 30 | 6 | -6 | -10 | 0.8 | WN**0604... | 3 |

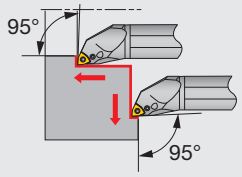
*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius

**SPARE PARTS**

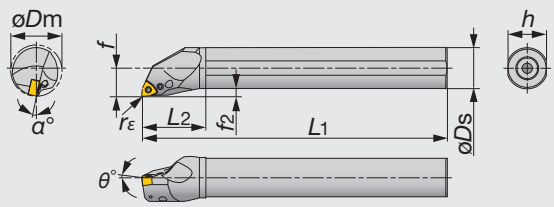
| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|---|---|
| A**-AWLNR/L... | ACP3S-E | ACS-5W | BP-7 | SP-2.5 | ASW322 | CSTB-3.5 | T-15F |



## Lever clamp boring bars, for negative trigon inserts




Cutting edge style **L**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A16M-PWLNR/L0604-D200 | STEEL | 20 | 16 | 11 | 150 | 32 | 15 | 3 | -8 | -17 | 0.8 | WN**0604... | 1.7 |
| A20Q-PWLNR/L0604-D250 | STEEL | 25 | 20 | 13 | 180 | 36 | 18 | 3 | -6 | -14 | 0.8 | WN**0604... | 1.7 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius

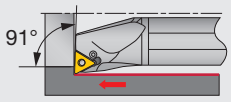
**SPARE PARTS**

| Designation | Clamping screw | Wrench | Lever | Oil supply attachment | Screw for oil hole |
|---|---|---|---|---|---|
| A16M-PWLNR/L0604-D200 | LCS33 | P-2F | LCL33N | - | SSHM3-4 |
| A20Q-PWLNR/L0604-D250 | LCS33 | P-2F | LCL33N | EA20 | SSHM3-4 |

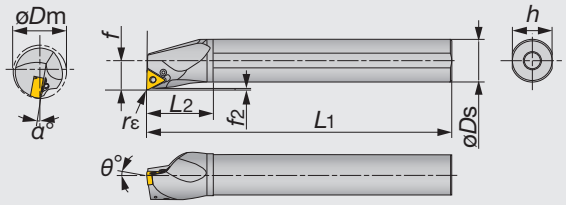
A-AWLNR/L-Eco, A-PWLNR/L-Eco: Inserts → **B090 -**

## A-PTFNR/L-Eco

Lever clamp boring bars, for negative triangle inserts




Cutting edge style **F**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A25R-PTFNR/L1104-D320 | STEEL | 32 | 25 | 17 | 200 | 45 | 23 | 1.31 | -6 | -12 | 0.8 | TN**1104... | 2 |
| A32S-PTFNR/L1104-D400 | STEEL | 40 | 32 | 22 | 250 | 50 | 30 | 1.25 | -6 | -10 | 0.8 | TN**1104... | 2 |

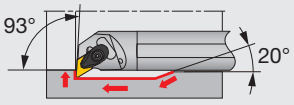
*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius

**SPARE PARTS**

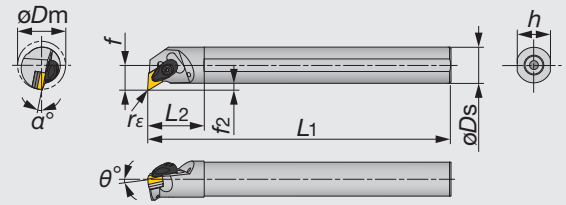
| Designation | Clamping screw | Wrench | Lever |
|---|---|---|---|
| A**-PTFNR/L... | LCS23A | P-2.5 | LCL23 |

## A-ADUNR/L-Eco

Double-clamp boring bars, for negative 55° rhombic inserts




Cutting edge style **U**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A25R-ADUNR/L1104-D320 | STEEL | 32 | 25 | 17 | 200 | 45 | 23 | 4.5 | -6 | -13 | 0.8 | DN**1104... | 3 |
| A32S-ADUNR/L1104-D400 | STEEL | 40 | 32 | 22 | 250 | 50 | 30 | 6 | -6 | -11 | 0.8 | DN**1104... | 3 |

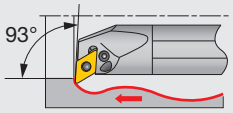
*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius

**SPARE PARTS**

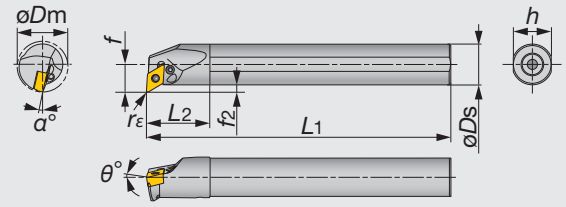
| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|---|---|
| A**-ADUNR/L... | ACP3S-E | ACS-5W | BP-7 | SP-2.5 | ASD322 | CSTB-3.5 | T-15F |

## A-PDUNR/L-Eco

Lever clamp boring bars, for negative 55° rhombic inserts




Cutting edge style **U**




Right hand (R) shown.

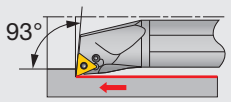
| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A20Q-PDUNR/L1104-D250 | STEEL | 25 | 20 | 13 | 180 | 36 | 18 | 3 | -6 | -14 | 0.8 | DN**1104... | 1.7 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (PDUNL ** type), and the left hand insert (L) is used for the right hand toolholders (PDUNR ** type).

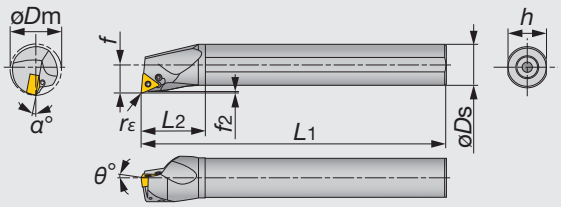
**SPARE PARTS**

| Designation | Clamping screw | Wrench | Lever | Oil supply attachment | Screw for oil hole |
|---|---|---|---|---|---|
| A20Q-PDUNR/L1104-D250 | LCS22A | P-2F | LCL33NL | EA20 | SSHM2.5-3 |

# Lever clamp boring bars, for negative triangle inserts




Cutting edge style **U**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A25R-PTUNR/L1104-D320 | STEEL | 32 | 25 | 17 | 200 | 45 | 23 | 1.22 | -6 | -12 | 0.8 | TN**1104... | 2 |
| A32S-PTUNR/L1104-D400 | STEEL | 40 | 32 | 22 | 250 | 50 | 30 | 1.16 | -6 | -10 | 0.8 | TN**1104... | 2 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius

## SPARE PARTS

| Designation | Clamping screw | Wrench | Lever | Oil supply attachment | Screw for oil hole |
|---|---|---|---|---|---|
| A25R-PTUNR/L1104-D320 | LCS23A | P-2.5 | LCL23 | EA-25 | SSHM4-5 |
| A32S-PTUNR/L1104-D400 | LCS23A | P-2.5 | LCL23 | EA-32 | SSHM4-5 |

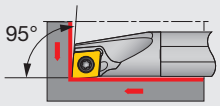
A-PTFNR/L-Eco, A-PTUNR/L-Eco: Inserts → **B079 -**

A-ADUNR/L-Eco, A-PDUNR/L-Eco: Inserts → **B061 -**

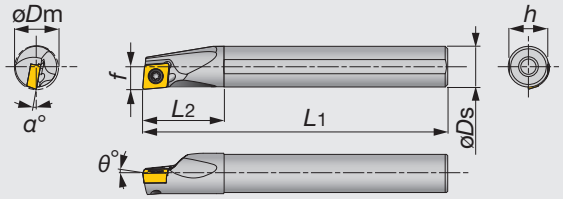
## A/E-SCLCR/L

Screw-on boring bars, for positive 80° rhombic inserts






Cutting edge style **L**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A04F-SCLCR/L03-D050 | STEEL | 5 | 4 | 2.5 | 80 | 8 | 3.8 | 0 | -15 | 0.2 | CC**03X1... | 0.6 |
| A05F-SCLCR/L03-D060 | STEEL | 6 | 5 | 3 | 80 | 9 | 4.8 | 0 | -13 | 0.2 | CC**03X1... | 0.6 |
| A06G-SCLCR/L04-D070 | STEEL | 7 | 6 | 3.5 | 90 | 11 | 5.75 | 0 | -13 | 0.2 | CC**04T1... | 0.6 |
| A07G-SCLCR/L04-D080 | STEEL | 8 | 7 | 4 | 90 | 12 | 6.75 | 0 | -11 | 0.2 | CC**04T1... | 0.6 |
| A08H-SCLCR/L06-D100 | STEEL | 10 | 8 | 5.5 | 100 | 16 | 7.5 | 0 | -13 | 0.4 | CC**0602... | 1.2 |
| A10F-SCLCR06-D120 | STEEL | 12 | 10 | 6 | 80 | 20 | 9 | 0 | -10 | 0.4 | CC**0602... | 1.2 |
| A10K-SCLCR/L06-D120 | STEEL | 12 | 10 | 6 | 125 | 20 | 9 | 0 | -10 | 0.4 | CC**0602... | 1.2 |
| A12H-SCLCR06-D140 | STEEL | 14 | 12 | 7 | 100 | 24 | 11 | 0 | -8 | 0.4 | CC**0602... | 1.2 |
| A12M-SCLCR/L06-D140 | STEEL | 14 | 12 | 7 | 150 | 24 | 11 | 0 | -8 | 0.4 | CC**0602... | 1.2 |
| A12H-SCLCR06-D160 | STEEL | 16 | 12 | 9 | 100 | 24 | 11 | 0 | -7 | 0.4 | CC**0602... | 1.2 |
| A12M-SCLCR/L06-D160 | STEEL | 16 | 12 | 9 | 150 | 24 | 11 | 0 | -7 | 0.4 | CC**0602... | 1.2 |
| A16K-SCLCR09-D180 | STEEL | 18 | 16 | 9 | 125 | 32 | 15 | 0 | -9 | 0.8 | CC**09T3... | 3 |
| A16Q-SCLCR/L09-D180 | STEEL | 18 | 16 | 9 | 180 | 32 | 15 | 0 | -10 | 0.8 | CC**09T3... | 3 |
| A16K-SCLCR09-D200 | STEEL | 20 | 16 | 11 | 125 | 32 | 15 | 0 | -9 | 0.8 | CC**09T3... | 3 |
| A16Q-SCLCR/L09-D200 | STEEL | 20 | 16 | 11 | 180 | 32 | 15 | 0 | -9 | 0.8 | CC**09T3... | 3 |
| A20R-SCLCR/L09-D220 | STEEL | 22 | 20 | 11 | 200 | 32 | 18 | 0 | -8 | 0.8 | CC**09T3... | 3 |
| A25S-SCLCR/L09-D270 | STEEL | 27 | 25 | 13.5 | 250 | 45 | 23 | 0 | -6 | 0.8 | CC**09T3... | 3 |
| E04G-SCLCR/L03-D050 | CARBIDE | 5 | 4 | 2.5 | 90 | 9 | 3.8 | 0 | -15 | 0.2 | CC**03X1... | 0.6 |
| E05G-SCLCR/L03-D060 | CARBIDE | 6 | 5 | 3 | 90 | 10 | 4.8 | 0 | -13 | 0.2 | CC**03X1... | 0.6 |
| E06H-SCLCR/L04-D070 | CARBIDE | 7 | 6 | 3.5 | 100 | 12 | 5.75 | 0 | -13 | 0.2 | CC**04T1... | 0.6 |
| E07H-SCLCR/L04-D080 | CARBIDE | 8 | 7 | 4 | 100 | 14 | 6.75 | 0 | -11 | 0.2 | CC**04T1... | 0.6 |
| E08G-SCLCR06-D100 | CARBIDE | 10 | 8 | 5.5 | 90 | 22 | 7.5 | 0 | -13 | 0.4 | CC**0602... | 1.2 |
| E08K-SCLCR/L06-D100 | CARBIDE | 10 | 8 | 5.5 | 125 | 22 | 7.5 | 0 | -13 | 0.4 | CC**0602... | 1.2 |
| E10F-SCLCR06-D120 | CARBIDE | 12 | 10 | 6 | 80 | 25 | 9 | 0 | -10 | 0.4 | CC**0602... | 1.2 |
| E10H-SCLCR06-D120 | CARBIDE | 12 | 10 | 6 | 100 | 25 | 9 | 0 | -10 | 0.4 | CC**0602... | 1.2 |
| E10M-SCLCR/L06-D120 | CARBIDE | 12 | 10 | 6 | 150 | 25 | 9 | 0 | -10 | 0.4 | CC**0602... | 1.2 |
| E12G-SCLCR06-D140 | CARBIDE | 14 | 12 | 7 | 90 | 27 | 11 | 0 | -8 | 0.4 | CC**0602... | 1.2 |
| E12J-SCLCR06-D140 | CARBIDE | 14 | 12 | 7 | 110 | 27 | 11 | 0 | -8 | 0.4 | CC**0602... | 1.2 |
| E12Q-SCLCR/L06-D140 | CARBIDE | 14 | 12 | 7 | 180 | 27 | 11 | 0 | -8 | 0.4 | CC**0602... | 1.2 |
| E12G-SCLCR06-D160 | CARBIDE | 16 | 12 | 9 | 90 | 27 | 11 | 0 | -7 | 0.4 | CC**0602... | 1.2 |
| E12J-SCLCR06-D160 | CARBIDE | 16 | 12 | 9 | 110 | 27 | 11 | 0 | -7 | 0.4 | CC**0602... | 1.2 |
| E12Q-SCLCR/L06-D160 | CARBIDE | 16 | 12 | 9 | 180 | 27 | 11 | 0 | -7 | 0.4 | CC**0602... | 1.2 |
| E16H-SCLCR09-D180 | CARBIDE | 18 | 16 | 9 | 100 | 32 | 15 | 0 | -10 | 0.8 | CC**09T3... | 3 |
| E16L-SCLCR09-D180 | CARBIDE | 18 | 16 | 9 | 130 | 32 | 15 | 0 | -10 | 0.8 | CC**09T3... | 3 |
| E16R-SCLCR/L09-D180 | CARBIDE | 18 | 16 | 9 | 200 | 32 | 15 | 0 | -10 | 0.8 | CC**09T3... | 3 |
| E16H-SCLCR09-D200 | CARBIDE | 20 | 16 | 11 | 100 | 32 | 15 | 0 | -9 | 0.8 | CC**09T3... | 3 |
| E16L-SCLCR09-D200 | CARBIDE | 20 | 16 | 11 | 130 | 32 | 15 | 0 | -9 | 0.8 | CC**09T3... | 3 |
| E16R-SCLCR/L09-D200 | CARBIDE | 20 | 16 | 11 | 200 | 32 | 15 | 0 | -9 | 0.8 | CC**09T3... | 3 |
| E20S-SCLCR09-D220 | CARBIDE | 22 | 20 | 11 | 250 | 36 | 18 | 0 | -8 | 0.8 | CC**09T3... | 3 |
| E25T-SCLCR09-D270 | CARBIDE | 27 | 25 | 13.5 | 300 | 45 | 23 | 0 | -6 | 0.8 | CC**09T3... | 3 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (SCLCL** type), and the left hand insert (L) is used for the right hand toolholders (SCLCR** type).

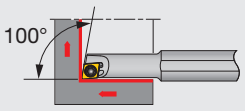
### SPARE PARTS



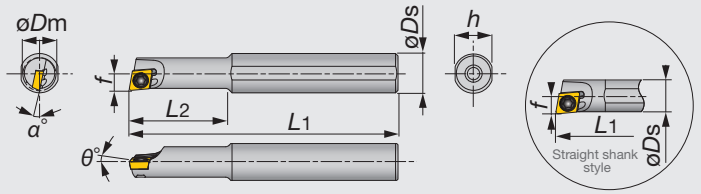

| Designation | Clamping screw | Wrench |
|---|---|---|
| A**-SCLCR/L03-D... | CSTA-1.6 | T-6F |
| A**-SCLCR/L04-D... | CSTB-2 | T-6F |
| A**-SCLCR/L06-D... | CSTB-2.5S | T-8F |
| A**-SCLCR/L09-D... | CSTB-4S | T-15F |
| E**-SCLCR/L03-D... | CSTA-1.6 | T-6F |
| E**-SCLCR/L04-D... | CSTB-2 | T-6F |
| E**-SCLCR/L06-D... | CSTB-2.5S | T-8F |
| E16*-SCLCR/L09-D... | CSTB-4L060 | T-15F |
| E2**-SCLCR/L09-D... | CSTB-4S | T-15F |

# A/E-SEXPR/L

## Screw-on boring bars, for positive 75° rhombic inserts




Cutting edge style **X**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A04F-SEXPR/L03-D045 | STEEL | 4.5 | 4 | 2.3 | 80 | 8 | 3.8 | 0 | -15 | 0.2 | EP**03X1... | 0.6 |
| A04F-SEXPR/L03-D050 | STEEL | 5 | 4 | 2.5 | 80 | 8 | 3.8 | 0 | -13 | 0.2 | EP**03X1... | 0.6 |
| A05F-SEXPR/L04-D055 | STEEL | 5.5 | 5 | 2.75 | 80 | 9 | 4.8 | 0 | -12 | 0.4 | EP**0401... | 0.6 |
| A06G-SEXPR/L04-D070 | STEEL | 7 | 6 | 3.6 | 90 | 11 | 5.75 | 0 | -12 | 0.4 | EP**0401... | 0.6 |
| A08H-SEXPR/L04-D055 | STEEL | 5.5 | 8 | 2.75 | 100 | 16 | 7.5 | 0 | -12 | 0.4 | EP**0401... | 0.6 |
| A08H-SEXPR/L04-D070 | STEEL | 7 | 8 | 3.6 | 100 | 20 | 7.5 | 0 | -12 | 0.4 | EP**0401... | 0.6 |
| E04G-SEXPR/L03-D045 | CARBIDE | 4.5 | 4 | 2.3 | 90 | 9 | 3.8 | 0 | -15 | 0.2 | EP**03X1... | 0.6 |
| E04G-SEXPR/L03-D050 | CARBIDE | 5 | 4 | 2.5 | 90 | 9 | 3.8 | 0 | -13 | 0.2 | EP**03X1... | 0.6 |
| E05G-SEXPR/L04-D055 | CARBIDE | 5.5 | 5 | 2.75 | 90 | 10 | 4.8 | 0 | -12 | 0.4 | EP**0401... | 0.6 |
| E06H-SEXPR/L04-D070 | CARBIDE | 7 | 6 | 3.6 | 100 | 12 | 5.75 | 0 | -12 | 0.4 | EP**0401... | 0.6 |
| E08K-SEXPR/L04-D055 | CARBIDE | 5.5 | 8 | 2.75 | 125 | 28 | 7.5 | 0 | -12 | 0.4 | EP**0401... | 0.6 |
| E08K-SEXPR/L04-D070 | CARBIDE | 7 | 8 | 3.6 | 125 | 40 | 7.5 | 0 | -12 | 0.4 | EP**0401... | 0.6 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (SEXPL** type), and the left hand insert (L) is used for the right hand toolholders (SEXPR** type).

### SPARE PARTS




| Designation | Clamping screw | Wrench |
|---|---|---|
| A**-SEXPR/L03-D... | CSTA-1.6 | T-6F |
| A**-SEXPR/L04-D... | CSTB-2 | T-6F |
| E**-SEXPR/L03-D... | CSTA-1.6 | T-6F |
| E**-SEXPR/L04-D... | CSTB-2 | T-6F |

Int. Toolholder

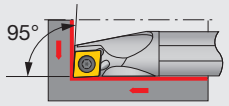
A/E-SCLCR/L: Inserts → **B104 -**, CBN → **B168 -**, PCD → **B177**

A/E-SEXPR/L: Inserts → **B120 -**, CBN → **B171**, PCD → **B178**

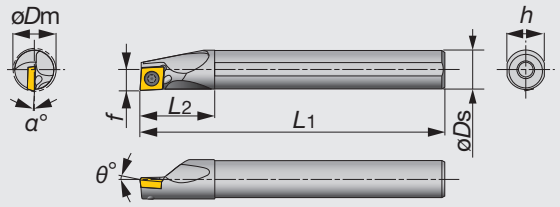
# A/E-SCLPR/L

Screw-on boring bars, for positive 80° rhombic inserts






Cutting edge style **L**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A08H-SCLPR/L06-D100 | STEEL | 10 | 8 | 5.5 | 100 | 16 | 7.5 | 5 | -8 | 0.4 | CP**0602... | 1.2 |
| A10K-SCLPR/L06-D120 | STEEL | 12 | 10 | 6 | 125 | 20 | 9 | 5 | -5 | 0.4 | CP**0602... | 1.2 |
| A10K-SCLPR/L08-D120 | STEEL | 12 | 10 | 6 | 125 | 20 | 9 | 5 | -5 | 0.4 | CP**0802... | 1.4 |
| A12M-SCLPR/L06-D140 | STEEL | 14 | 12 | 7 | 150 | 24 | 11 | 5 | -4 | 0.4 | CP**0602... | 1.2 |
| A12M-SCLPR/L08-D140 | STEEL | 14 | 12 | 7 | 150 | 24 | 11 | 5 | -4 | 0.4 | CP**0802... | 1.4 |
| A12M-SCLPR/L08-D160 | STEEL | 16 | 12 | 9 | 150 | 24 | 11 | 5 | -3 | 0.4 | CP**0802... | 1.4 |
| A16Q-SCLPR/L09-D180 | STEEL | 18 | 16 | 9 | 180 | 32 | 15 | 5 | -3.5 | 0.8 | CP**0903... | 3 |
| A16Q-SCLPR/L09-D200 | STEEL | 20 | 16 | 11 | 180 | 32 | 15 | 5 | -3 | 0.8 | CP**0903... | 3 |
| A20R-SCLPR/L09-D220 | STEEL | 22 | 20 | 11 | 200 | 36 | 18 | 5 | -2 | 0.8 | CP**0903... | 3 |
| A25S-SCLPR/L09-D270 | STEEL | 27 | 25 | 13.5 | 250 | 45 | 23 | 5 | -1 | 0.8 | CP**0903... | 3 |
| E08K-SCLPR/L06-D100 | CARBIDE | 10 | 8 | 5.5 | 125 | 22 | 7.5 | 5 | -8 | 0.4 | CP**0602... | 1.2 |
| E10M-SCLPR/L06-D120 | CARBIDE | 12 | 10 | 6 | 150 | 25 | 9 | 5 | -5 | 0.4 | CP**0602... | 1.2 |
| E10H-SCLPR08-D120 | CARBIDE | 12 | 10 | 6 | 100 | 25 | 9 | 5 | -5 | 0.4 | CP**0802... | 1.4 |
| E10M-SCLPR/L08-D120 | CARBIDE | 12 | 10 | 6 | 150 | 25 | 9 | 5 | -5 | 0.4 | CP**0802... | 1.4 |
| E12Q-SCLPR/L06-D140 | CARBIDE | 14 | 12 | 7 | 180 | 27 | 11 | 5 | -4 | 0.4 | CP**0602... | 1.2 |
| E12G-SCLPR08-D140 | CARBIDE | 14 | 12 | 7 | 90 | 27 | 11 | 5 | -4 | 0.4 | CP**0802... | 1.4 |
| E12J-SCLPR08-D140 | CARBIDE | 14 | 12 | 7 | 110 | 27 | 11 | 5 | -4 | 0.4 | CP**0802... | 1.4 |
| E12Q-SCLPR/L08-D140 | CARBIDE | 14 | 12 | 7 | 180 | 27 | 11 | 5 | -4 | 0.4 | CP**0802... | 1.4 |
| E12G-SCLPR08-D160 | CARBIDE | 16 | 12 | 9 | 90 | 27 | 11 | 5 | -3 | 0.4 | CP**0802... | 1.4 |
| E12J-SCLPR08-D160 | CARBIDE | 16 | 12 | 9 | 110 | 27 | 11 | 5 | -3 | 0.4 | CP**0802... | 1.4 |
| E12Q-SCLPR/L08-D160 | CARBIDE | 16 | 12 | 9 | 180 | 27 | 11 | 5 | -3 | 0.4 | CP**0802... | 1.4 |
| E16H-SCLPR09-D180 | CARBIDE | 18 | 16 | 9 | 100 | 32 | 15 | 5 | -3.5 | 0.8 | CP**0903... | 3 |
| E16L-SCLPR09-D180 | CARBIDE | 18 | 16 | 9 | 130 | 32 | 15 | 5 | -3.5 | 0.8 | CP**0903... | 3 |
| E16R-SCLPL09-D180 | CARBIDE | 18 | 16 | 9 | 200 | 32 | 15 | 5 | -3.5 | 0.8 | CP**0903... | 3 |
| E16H-SCLPR09-D200 | CARBIDE | 20 | 16 | 11 | 100 | 32 | 15 | 5 | -3 | 0.8 | CP**0903... | 3 |
| E16L-SCLPR09-D200 | CARBIDE | 20 | 16 | 11 | 130 | 32 | 15 | 5 | -3 | 0.8 | CP**0903... | 3 |
| E16R-SCLPL09-D200 | CARBIDE | 20 | 16 | 11 | 200 | 32 | 15 | 5 | -3 | 0.8 | CP**0903... | 3 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (SCLPL** type), and the left hand insert (L) is used for the right hand toolholders (SCLPR** type).

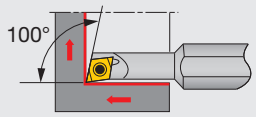
## SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| A**-SCLPR/L06-D... | CSTB-2.5S | T-8F |
| A10K-SCLPR/L08-D120 | CSTB-3L042 | T-9F |
| A12M-SCLPR/L08-D... | CSTB-3L050 | T-9F |
| A**-SCLPR/L09-D... | CSTB-4L060 | T-15F |
| E**-SCLPR/L06-D... | CSTB-2.5S | T-8F |
| E10*-SCLPR/L08-D... | CSTB-3L042 | T-9F |
| E12*-SCLPR/L08-D... | CSTB-3L050 | T-9F |
| E16*-SCLPR/L09-D... | CSTB-4L060 | T-15F |

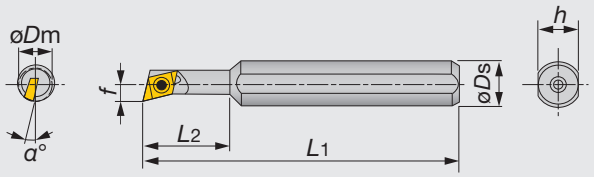
A/E-SCLPR/L: Inserts → **B111 -**

# JS-SEXPR/L

## Screw-on boring bar, for positive 75° rhombic inserts




Cutting edge style **X**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| JS08H-SEXPR045 | STEEL | 5.5 | 8 | 2.7 | 100 | 16 | 7 | 12 | 0.4 | EP**0401... | 0.6 |
| JS08H-SEXPR047 | STEEL | 7 | 8 | 3.6 | 100 | 20 | 7 | 12 | 0.4 | EP**0401... | 0.6 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (SEXPL** type), and the left hand insert (L) is used for the right hand toolholders (SEXPR** type).

### SPARE PARTS




| Designation | Clamping screw | Wrench |
|---|---|---|
| JS08H-SEXPR04... | CSTB-2 | T-6F |

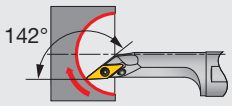


JS-SEXPR/L: Inserts → **B120 -**, CBN → **B171**, PCD → **B178**

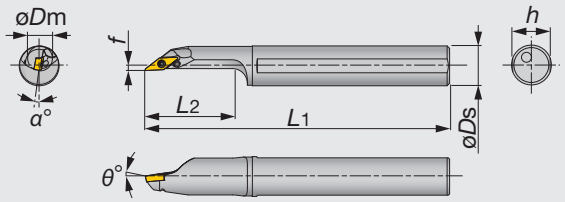
# STREAMJETBAR

## A-SVJBR/L

Screw-on boring bars, for positive 35° rhombic inserts




Cutting edge style **J**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A20R-SVJBR/L11-D250 | STEEL | 25 | 20 | 2 | 200 | 40 | 18 | -5 | -5 | 0.4 | VB**1103... | 1.2 |
| A25S-SVJBR/L11-D300 | STEEL | 30 | 25 | 3.5 | 250 | 50 | 23 | -5 | -5 | 0.4 | VB**1103... | 1.2 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (SVJBL** type), and the left hand insert (L) is used for the right hand toolholders (SVJBR** type).

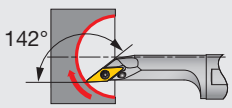
### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| A**-SVJB*11-D... | CSTB-2.5 | T-8F |

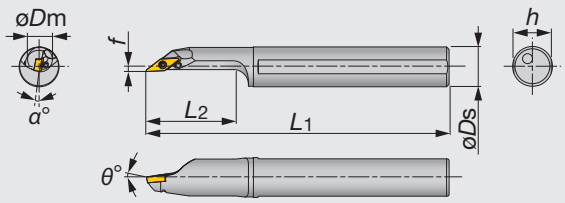
# STREAMJETBAR

## A-SVJCR/L

Screw-on boring bars, for positive 35° rhombic inserts




Cutting edge style **J**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A12M-SVJCR/L08-D160 | STEEL | 16 | 12 | 2 | 150 | 28 | 11 | -5 | -5 | 0.4 | VC**0802... | 0.6 |
| A16Q-SVJCR/L08-D200 | STEEL | 20 | 16 | 2 | 180 | 35 | 15 | -5 | -5 | 0.4 | VC**0802... | 0.6 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (SVJCL** type), and the left hand insert (L) is used for the right hand toolholders (SVJCR** type).

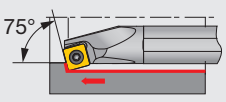
### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| A**-SVJC*08-D... | CSTB-2L | T-6F |

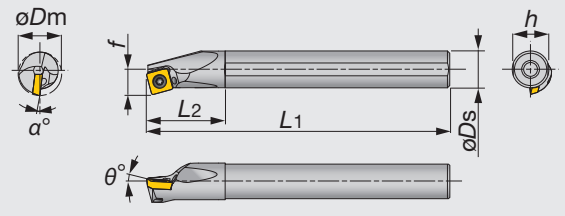
# STREAMJETBAR

## A-SSKPR

Screw-on boring bars, for positive square inserts




Cutting edge style **K**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A16Q-SSKPR09-D200 | STEEL | 20 | 16 | 11 | 180 | 32 | 15 | 5 | -6 | 0.8 | SP**0903... | 3 |
| A20R-SSKPR09-D240 | STEEL | 24 | 20 | 13 | 200 | 36 | 18 | 5 | -2 | 0.8 | SP**0903... | 3 |
| A25S-SSKPR12-D310 | STEEL | 31 | 25 | 17 | 250 | 45 | 23 | 5 | -2 | 0.8 | SP**1204... | 6 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (SSKPL** type), and the left hand insert (L) is used for the right hand toolholders (SSKPR** type).

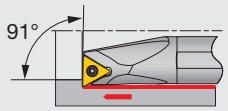
### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| A**-SSKPR09-D2*0 | CSTB-4L060 | T-15F |
| A25S-SSKPR12-D310 | CSTB-5S | T-20F |

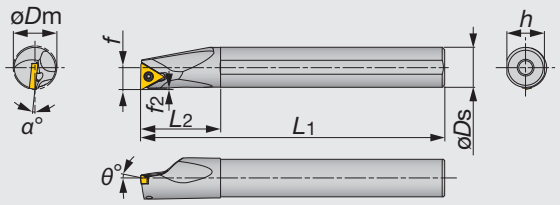
# STREAMJETBAR

## A/E-STFCR/L

Screw-on boring bars, for positive triangle inserts




Cutting edge style **F**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A10K-STFCR/L1103-D120 | STEEL | 12 | 10 | 6.5 | 125 | 20 | 9 | 0.6 | 0 | -13 | 0.4 | TC**1103... | 1.2 |
| A12M-STFCR/L1103-D140 | STEEL | 14 | 12 | 7 | 150 | 24 | 11 | 0.5 | 0 | -10 | 0.4 | TC**1103... | 1.2 |
| A16Q-STFCR/L1103-D180 | STEEL | 18 | 16 | 9 | 180 | 32 | 15 | 0.5 | 0 | -7 | 0.4 | TC**1103... | 1.2 |
| E10M-STFCR/L1103-D120 | CARBIDE | 12 | 10 | 6.5 | 150 | 25 | 9 | 0.7 | 0 | -13 | 0.4 | TC**1103... | 1.2 |
| E12Q-STFCR/L1103-D140 | CARBIDE | 14 | 12 | 7 | 180 | 27 | 11 | 0.5 | 0 | -10 | 0.4 | TC**1103... | 1.2 |
| E16R-STFCR/L1103-D180 | CARBIDE | 18 | 16 | 9 | 200 | 32 | 15 | 0.5 | 0 | -7 | 0.4 | TC**1103... | 1.2 |

*Torque: Recommended torque (N·m) for clamping **$r_\varepsilon$: Standard corner radius

Note: When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (STFCL** type), and the left hand insert (L) is used for the right hand toolholders (STFCR** type).

### SPARE PARTS





| Designation | Clamping screw | Wrench |
|---|---|---|
| A**-STFCR/L1103-D... | CSTB-2.5 | T-8F |
| E**-STFCR/L1103-D... | CSTB-2.5 | T-8F |




A-SVJBR/L: Inserts → **B142 -**, CBN → **B169 -**

A-SVJCR/L: Inserts → **B145 -**

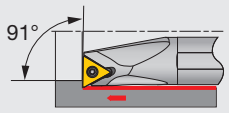
A-SSKPR: Inserts → **B123 -**, CBN → **B168**

A/E-STFCR/L: Inserts → **B126 -**, PCD → **B177**

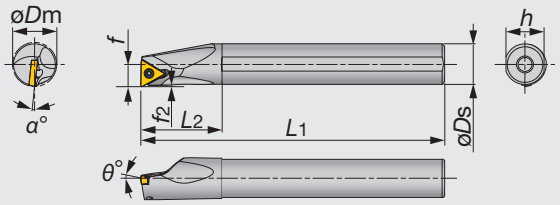
# A/E-STFPR/L

Screw-on boring bars, for positive triangle inserts






Cutting edge style **F**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A08H-STFPR/L09-D100 | STEEL | 10 | 8 | 5.5 | 100 | 16 | 7.5 | 0.7 | 5 | -8 | 0.4 | TP**0902... | 0.9 |
| A10K-STFPR/L1102-D120 | STEEL | 12 | 10 | 6.5 | 125 | 20 | 9 | 0.7 | 5 | -6 | 0.4 | TP**1102... | 1.2 |
| A12M-STFPR/L1102-D140 | STEEL | 14 | 12 | 7.0 | 150 | 24 | 11 | 0.6 | 5 | -4 | 0.4 | TP**1102... | 1.2 |
| A16Q-STFPR/L13-D180 | STEEL | 18 | 16 | 9 | 180 | 32 | 15 | 0.7 | 5 | -2 | 0.4 | TP**1303... | 1.4 |
| A20R-STFPR13-D220 | STEEL | 22 | 20 | 11 | 200 | 36 | 18 | 0.8 | 5 | -2 | 0.4 | TP**1303... | 1.4 |
| A25S-STFPR16-D270 | STEEL | 27 | 25 | 13.5 | 250 | 45 | 23 | 0.6 | 5 | -1 | 0.4 | TP**16T3... | 3 |
| E08K-STFPR/L09-D100 | CARBIDE | 10 | 8 | 5.5 | 125 | 22 | 7.5 | 0.7 | 5 | -8 | 0.4 | TP**0902... | 0.9 |
| E10M-STFPR/L1102-D120 | CARBIDE | 12 | 10 | 6.5 | 150 | 25 | 9 | 0.7 | 5 | -6 | 0.4 | TP**1102... | 1.2 |
| E12Q-STFPR/L1102-D140 | CARBIDE | 14 | 12 | 7 | 180 | 27 | 11 | 0.6 | 5 | -4 | 0.4 | TP**1102... | 1.2 |
| E16R-STFPR13-D180 | CARBIDE | 18 | 16 | 9 | 200 | 32 | 15 | 0.7 | 5 | -2 | 0.4 | TP**1303... | 1.4 |
| E20S-STFPR13-D220 | CARBIDE | 22 | 20 | 11 | 250 | 36 | 18 | 0.8 | 5 | -2 | 0.4 | TP**1303... | 1.4 |

*Torque: Recommended torque (N·m) for clamping **$r_\varepsilon$: Standard corner radius

Note: When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (STFPL ** type), and the left hand insert (L) is used for the right hand toolholders (STFPR ** type).

(1) Inserts of TPGH, TPGM and TPGA are not applicable.

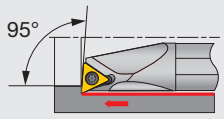
## SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| A08H-STFPR/L09-D100 | CSTB-2.2S | T-7F |
| A10K-STFPR/L1102-D120 | CSTB-2.5B | T-8F |
| A12M-STFPR/L1102-D140 | CSTB-2.5 | T-8F |
| A16Q-STFPR/L13-D180 | CSTB-3S | T-9F |
| A20R-STFPR13-D220 | CSTB-3 | T-9F |
| A25S-STFPR16-D270 | CSTB-4M | T-15F |
| E08K-STFPR/L09-D100 | CSTB-2.2S | T-7F |
| E10M-STFPR/L1102-D120 | CSTB-2.5B | T-8F |
| E12Q-STFPR/L1102-D140 | CSTB-2.5 | T-8F |
| E16R-STFPR13-D180 | CSTB-3S | T-9F |
| E20S-STFPR13-D220 | CSTB-3 | T-9F |

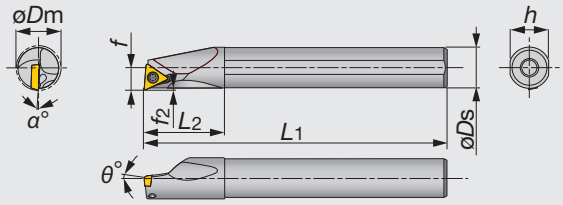
A/E-STFPR/L: Inserts → **B131 -**, CBN → **B168 -**, PCD → **B178**

# A/E-STUPR/L

Screw-on boring bars, for positive triangle inserts




Cutting edge style **U**




Right hand (R) shown.



| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A07G-STUPR/L07-D080 | STEEL | 8 | 7 | 4 | 90 | 12 | 6.75 | 0.4 | 5 | -10 | 0.4 | TP**0701... | 0.9 |
| A08H-STUPR/L07-D080 | STEEL | 8 | 8 | 4 | 100 | 19.5 | 7.5 | 0.5 | 5 | -10 | 0.4 | TP**0701... | 0.9 |
| A08H-STUPR/L09-D100 | STEEL | 10 | 8 | 5.5 | 100 | 16 | 7.5 | 0.6 | 5 | -8 | 0.4 | TP**0902...(1) | 0.9 |
| A10F-STUPR1102-D120 | STEEL | 12 | 10 | 6.5 | 80 | 20 | 9 | 1.4 | 5 | -6 | 0.4 | TP**1102...(1) | 1.2 |
| A10K-STUPR/L1102-D120 | STEEL | 12 | 10 | 6.5 | 125 | 20 | 9 | 0.7 | 5 | -6 | 0.4 | TP**1102...(1) | 1.2 |
| A10K-STUPR/L1103-D120 | STEEL | 12 | 10 | 6.5 | 125 | 20 | 9 | 0.6 | 5 | -10 | 0.4 | TP**1103...(1) | 1.4 |
| A12H-STUPR1102-D140 | STEEL | 14 | 12 | 7 | 100 | 24 | 11 | 0.9 | 5 | -4 | 0.4 | TP**1102...(1) | 1.2 |
| A12M-STUPR/L1102-D140 | STEEL | 14 | 12 | 7 | 150 | 24 | 11 | 0.7 | 5 | -4 | 0.4 | TP**1102...(1) | 1.2 |
| A12M-STUPR/L1103-D140 | STEEL | 14 | 12 | 7 | 150 | 24 | 11 | 0.6 | 5 | -6 | 0.4 | TP**1103...(1) | 1.4 |
| A12H-STUPR1102-D160 | STEEL | 16 | 12 | 9 | 100 | 24 | 11 | 0.6 | 5 | -3 | 0.4 | TP**1102...(1) | 1.2 |
| A12M-STUPR/L1102-D160 | STEEL | 16 | 12 | 9 | 150 | 24 | 11 | 0.6 | 5 | -3 | 0.4 | TP**1102...(1) | 1.2 |
| A16K-STUPR13-D180 | STEEL | 18 | 16 | 9 | 125 | 32 | 15 | 0.9 | 5 | -3 | 0.4 | TP**1303...(1) | 1.4 |
| A16Q-STUPR/L1103-D180 | STEEL | 18 | 16 | 9 | 180 | 32 | 15 | 0.8 | 5 | -4 | 0.4 | TP**1103...(1) | 1.4 |
| A16Q-STUPR/L13-D180 | STEEL | 18 | 16 | 9 | 180 | 32 | 15 | 0.6 | 5 | -3 | 0.4 | TP**1303...(1) | 1.4 |
| A16K-STUPR13-D200 | STEEL | 20 | 16 | 11 | 125 | 32 | 15 | 0.6 | 5 | -3 | 0.4 | TP**1303...(1) | 1.4 |
| A16Q-STUPR/L13-D200 | STEEL | 20 | 16 | 11 | 180 | 32 | 15 | 0.6 | 5 | -3 | 0.4 | TP**1303...(1) | 1.4 |
| A20R-STUPR/L1103-D220 | STEEL | 22 | 20 | 11 | 200 | 36 | 18 | 0.7 | 5 | -2 | 0.4 | TP**1103...(1) | 1.4 |
| A20R-STUPR/L13-D220 | STEEL | 22 | 20 | 11 | 200 | 36 | 18 | 0.7 | 5 | -2 | 0.4 | TP**1303...(1) | 1.4 |
| A25S-STUPR/L16-D270 | STEEL | 27 | 25 | 13.5 | 250 | 45 | 23 | 0.5 | 5 | -1 | 0.8 | TP**16T3...(1) | 3 |
| A32T-STUPR/L16-D340 | STEEL | 34 | 32 | 17 | 300 | 50 | 30 | 0.7 | 5 | 0 | 0.8 | TP**16T3... | 3 |
| E07H-STUPR/L07-D080 | CARBIDE | 8 | 7 | 4 | 100 | 14 | 6.75 | 0.3 | 5 | -10 | 0.4 | TP**0701... | 0.9 |
| E08G-STUPR07-D080 | CARBIDE | 8 | 8 | 4 | 90 | 44.5 | 7.5 | 0.5 | 5 | -10 | 0.4 | TP**0701... | 0.9 |
| E08K-STUPR/L07-D080 | CARBIDE | 8 | 8 | 4 | 125 | 44.5 | 7.5 | 0.5 | 5 | -10 | 0.4 | TP**0701... | 0.9 |
| E08G-STUPR09-D100 | CARBIDE | 10 | 8 | 5.5 | 90 | 22 | 7 | 0.6 | 5 | -8 | 0.4 | TP**0902...(1) | 0.9 |
| E08K-STUPR/L09-D100 | CARBIDE | 10 | 8 | 5.5 | 125 | 22 | 7 | 0.6 | 5 | -8 | 0.4 | TP**0902...(1) | 0.9 |
| E10F-STUPR1102-D120 | CARBIDE | 12 | 10 | 6.5 | 80 | 25 | 9 | 0.5 | 5 | -6 | 0.4 | TP**1102...(1) | 1.2 |
| E10H-STUPR1102-D120 | CARBIDE | 12 | 10 | 6.5 | 100 | 25 | 9 | 0.6 | 5 | -6 | 0.4 | TP**1102...(1) | 1.2 |
| E10M-STUPR/L1102-D120 | CARBIDE | 12 | 10 | 6.5 | 150 | 25 | 9 | 0.6 | 5 | -6 | 0.4 | TP**1102...(1) | 1.2 |
| E10M-STUPR/L1103-D120 | CARBIDE | 12 | 10 | 6.5 | 150 | 25 | 9 | 0.7 | 5 | -10 | 0.4 | TP**1103...(1) | 1.4 |
| E12G-STUPR1102-D140 | CARBIDE | 14 | 12 | 7 | 90 | 27 | 11 | 0.9 | 5 | -4 | 0.4 | TP**1102...(1) | 1.2 |
| E12J-STUPR1102-D140 | CARBIDE | 14 | 12 | 7 | 110 | 27 | 11 | 0.6 | 5 | -4 | 0.4 | TP**1102...(1) | 1.2 |
| E12Q-STUPR/L1102-D140 | CARBIDE | 14 | 12 | 7 | 180 | 27 | 11 | 0.6 | 5 | -4 | 0.4 | TP**1102...(1) | 1.2 |
| E12Q-STUPR/L1103-D140 | CARBIDE | 14 | 12 | 7 | 180 | 27 | 11 | 0.7 | 5 | -6 | 0.4 | TP**1103...(1) | 1.4 |
| E12G-STUPR1102-D160 | CARBIDE | 16 | 12 | 9 | 90 | 27 | 11 | 0.6 | 5 | -3 | 0.4 | TP**1102...(1) | 1.2 |
| E12J-STUPR1102-D160 | CARBIDE | 16 | 12 | 9 | 110 | 27 | 11 | 0.6 | 5 | -3 | 0.4 | TP**1102...(1) | 1.2 |
| E12Q-STUPR/L1102-D160 | CARBIDE | 16 | 12 | 9 | 180 | 27 | 11 | 0.6 | 5 | -3 | 0.4 | TP**1102...(1) | 1.2 |
| E16H-STUPR13-D180 | CARBIDE | 18 | 16 | 9 | 100 | 32 | 15 | 0.9 | 5 | -3 | 0.4 | TP**1303...(1) | 1.4 |
| E16R-STUPR/L1103-D180 | CARBIDE | 18 | 16 | 9 | 200 | 32 | 15 | 0.8 | 5 | -3 | 0.4 | TP**1103...(1) | 1.4 |
| E16L-STUPR13-D180 | CARBIDE | 18 | 16 | 9 | 130 | 32 | 15 | 0.6 | 5 | -3 | 0.4 | TP**1303...(1) | 1.4 |
| E16R-STUPR/L13-D180 | CARBIDE | 18 | 16 | 9 | 200 | 32 | 15 | 0.6 | 5 | -3 | 0.4 | TP**1303...(1) | 1.4 |
| E16H-STUPR13-D200 | CARBIDE | 20 | 16 | 11 | 100 | 32 | 15 | 0.6 | 5 | -3 | 0.4 | TP**1303...(1) | 1.4 |
| E16L-STUPR13-D200 | CARBIDE | 20 | 16 | 11 | 130 | 32 | 15 | 0.6 | 5 | -3 | 0.4 | TP**1303...(1) | 1.4 |
| E16R-STUPL13-D200 | CARBIDE | 20 | 16 | 11 | 200 | 32 | 15 | 0.6 | 5 | -3 | 0.4 | TP**1303...(1) | 1.4 |
| E20S-STUPR1103-D220 | CARBIDE | 22 | 20 | 11 | 250 | 36 | 18 | 0.7 | 5 | -2 | 0.4 | TP**1103...(1) | 1.4 |
| E20S-STUPR13-D220 | CARBIDE | 22 | 20 | 11 | 250 | 36 | 18 | 0.6 | 5 | -2 | 0.4 | TP**1303...(1) | 1.4 |
| E25T-STUPR16-D270 | CARBIDE | 27 | 25 | 13.5 | 300 | 45 | 23 | 0.5 | 5 | -1 | 0.8 | TP**16T3... | 3 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius

Note: When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (STUPL ** type), and the left hand insert (L) is used for the right hand toolholders (STUPR ** type).

(1) Inserts of TPGH, TPGM and TPGA are not applicable.

A/E-STUPR/L: Inserts → **B131 -**, CBN → **B168 -**, PCD → **B178**

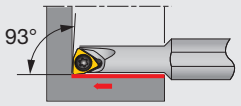
## SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| A07/08-STUPR/L07/09-D... | CSTB-2.2L038 | T-7F |
| A10*-STUPR/L1102-D120 | CSTB-2.5S | T-8F |
| A12*-STUPR/L1102-D... | CSTB-2.5B | T-8F |
| A12M-STUPR/L1103-D140 | CSTB-3L050 | T-9F |
| A16*-STUPR/L13-D... | CSTB-3S | T-9F |
| A20R-STUPR/L13-D220 | CSTB-3 | T-9F |
| A**-STUPR/L16-D... | CSTB-4M | T-15F |
| E07/08-STUPR/L07/09-D... | CSTB-2.2L038 | T-7F |
| E10*-STUPR/L1102-D120 | CSTB-2.5S | T-8F |
| E12*-STUPR/L1102-D... | CSTB-2.5B | T-8F |
| E**-STUPR/L1103-D... | CSTB-3L050 | T-9F |
| E16*-STUPR/L13-D... | CSTB-3S | T-9F |
| E20S-STUPR13-D220 | CSTB-3 | T-9F |
| E25T-STUPR16-D270 | CSTB-4M | T-15F |

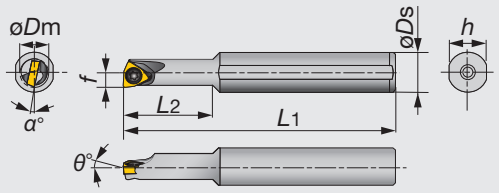
# STREAMJETBAR

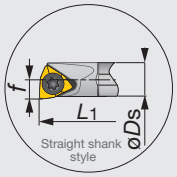
## A/E-SWUBR/L

Screw-on boring bars, for positive trigon inserts




Cutting edge style **U**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A05F-SWUBR/L03-D060 | STEEL | 6 | 5 | 3 | 80 | 9 | 4.8 | 0 | -13 | 0.4 | WB**0301... | 0.6 |
| A06G-SWUBR/L03-D070 | STEEL | 7 | 6 | 3.5 | 90 | 11 | 5.75 | 0 | -12 | 0.4 | WB**0301... | 0.6 |
| A07G-SWUBR/L03-D080 | STEEL | 8 | 7 | 4 | 90 | 12 | 6.75 | 0 | -11 | 0.4 | WB**0301... | 0.6 |
| A08H-SWUBR03-D060 | STEEL | 6 | 8 | 3.1 | 100 | 18 | 7.5 | 0 | -12 | 0.4 | WB**0301... | 0.6 |
| A08H-SWUBR03-D070 | STEEL | 7 | 8 | 3.6 | 100 | 20 | 7.5 | 0 | -12 | 0.4 | WB**0301... | 0.6 |
| E05G-SWUBR/L03-D060 | CARBIDE | 6 | 5 | 3 | 90 | 10 | 4.8 | 0 | -13 | 0.4 | WB**0301... | 0.6 |
| E06H-SWUBR/L03-D070 | CARBIDE | 7 | 6 | 3.5 | 100 | 12 | 5.75 | 0 | -12 | 0.4 | WB**0301... | 0.6 |
| E07H-SWUBR/L03-D080 | CARBIDE | 8 | 7 | 4 | 100 | 14 | 6.75 | 0 | -11 | 0.4 | WB**0301... | 0.6 |
| E08K-SWUBR03-D060 | CARBIDE | 6 | 8 | 3.1 | 125 | 30 | 7.5 | 0 | -12 | 0.4 | WB**0301... | 0.6 |
| E08K-SWUBR03-D070 | CARBIDE | 7 | 8 | 3.6 | 125 | 40 | 7.5 | 0 | -12 | 0.4 | WB**0301... | 0.6 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (SWUBL** type), and the left hand insert (L) is used for the right hand toolholders (SWUBR** type).

## SPARE PARTS

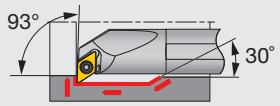
| Designation | Clamping screw | Wrench |
|---|---|---|
| A/E**-SWUBR/L... | CSTB-2 | T-6F |

A/E-SWUBR/L: Inserts → **B141**

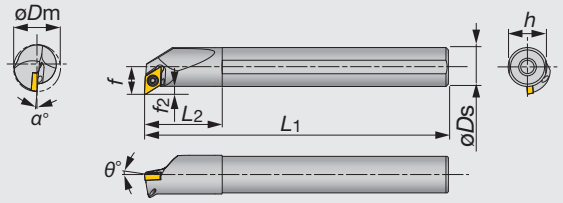
# STREAMJETBAR

## A/E-SDUCR/L

Screw-on boring bars, for positive 55° rhombic inserts




Cutting edge style **U**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A10K-SDUCR/L07-D130 | STEEL | 13 | 10 | 7 | 125 | 20 | 9 | 2 | 0 | -10 | 0.4 | DC**0702... | 1.2 |
| A12M-SDUCR/L07-D160 | STEEL | 16 | 12 | 9.3 | 150 | 24 | 11 | 3.3 | 0 | -6 | 0.4 | DC**0702... | 1.2 |
| A16Q-SDUCR/L07-D200 | STEEL | 20 | 16 | 11.3 | 180 | 32 | 15 | 3.3 | 0 | -5 | 0.4 | DC**0702... | 1.2 |
| A20R-SDUCR/L11-D270 | STEEL | 27 | 20 | 16.1 | 200 | 36 | 18 | 6.1 | 0 | -5 | 0.8 | DC**11T3... | 3 |
| A25S-SDUCR/L11-D320 | STEEL | 32 | 25 | 18.6 | 250 | 45 | 23 | 6.1 | 0 | -4 | 0.8 | DC**11T3... | 3 |
| E10H-SDUCR07-D130 | CARBIDE | 13 | 10 | 7 | 100 | 25 | 9 | 1.9 | 5 | -3.5 | 0.4 | DC**0702... | 1.2 |
| E10M-SDUCR/L07-D130 | CARBIDE | 13 | 10 | 7 | 150 | 25 | 9 | 2 | 0 | -10 | 0.4 | DC**0702... | 1.2 |
| E12J-SDUCR07-D160 | CARBIDE | 16 | 12 | 9.3 | 110 | 27 | 11 | 3.2 | 0 | -6 | 0.4 | DC**0702... | 1.2 |
| E12Q-SDUCR/L07-D160 | CARBIDE | 16 | 12 | 9.3 | 180 | 27 | 11 | 3.3 | 0 | -6 | 0.4 | DC**0702... | 1.2 |
| E16L-SDUCR07-D200 | CARBIDE | 20 | 16 | 11.3 | 130 | 32 | 15 | 3.2 | 0 | -5 | 0.4 | DC**0702... | 1.2 |
| E16R-SDUCR/L07-D200 | CARBIDE | 20 | 16 | 11.3 | 200 | 32 | 15 | 3.3 | 0 | -5 | 0.4 | DC**0702... | 1.2 |
| E20S-SDUCR11-D270 | CARBIDE | 27 | 20 | 16.1 | 250 | 36 | 18 | 6.1 | 0 | -5 | 0.8 | DC**11T3... | 3 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (SDUCL** type), and the left hand insert (L) is used for the right hand toolholders (SDUCR** type).

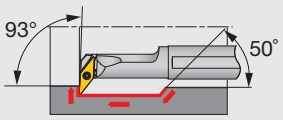
### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| A1**-SDUCR/L07-D1*0 | CSTB-2.5S | T-8F |
| A16Q-SDUCR/L07-D200 | CSTB-2.5 | T-8F |
| A2**-SDUCR/L11-D**0 | CSTB-4S | T-15F |
| E1**-SDUCR/L07-D1*0 | CSTB-2.5S | T-8F |
| E16*-SDUCR/L07-D200 | CSTB-2.5 | T-8F |
| E20S-SDUCR11-D270 | CSTB-4S | T-15F |

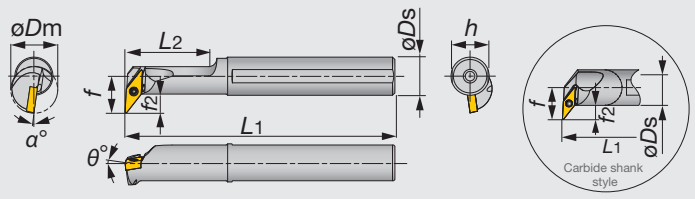
# STREAMJETBAR

## A/E-SVUBR/L

Screw-on boring bars, for positive 35° rhombic inserts




Cutting edge style **U**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A16Q-SVUBR/L11-D200 | STEEL | 20 | 16 | 15.5 | 180 | 35 | 15 | 8 | 0 | -8 | 0.4 | VB**1103... | 1.2 |
| A20R-SVUBR/L11-D250 | STEEL | 25 | 20 | 17.5 | 200 | 40 | 19 | 8 | 0 | -7 | 0.4 | VB**1103... | 1.2 |
| A25S-SVUBR/L16-D320 | STEEL | 32 | 25 | 20.5 | 250 | 50 | 23 | 8.5 | 0 | -6 | 0.8 | VB**1604... | 3 |
| E16R-SVUBR/L11-D245 | CARBIDE | 24.5 | 16 | 16 | 200 | - | 15 | 8 | 0 | -8 | 0.4 | VB**1103... | 1.2 |
| E20S-SVUBR/L11-D285 | CARBIDE | 28.5 | 20 | 18 | 250 | - | 19 | 8 | 0 | -7 | 0.4 | VB**1103... | 1.2 |
| E25T-SVUBR/L16-D340 | CARBIDE | 34 | 25 | 21 | 300 | - | 23 | 8.5 | 0 | -6 | 0.8 | VB**1604... | 3 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (SVUBL** type), and the left hand insert (L) is used for the right hand toolholders (SVUBR** type).

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| A**-SVUBR/L11-D2*0 | CSTB-2.5 | T-8F |
| A25S-SVUBR/L16-D320 | CSTB-3.5 | T-15F |
| E**-SVUBR/L11-D2*5 | CSTB-2.5 | T-8F |
| E25T-SVUBR/L16-D340 | CSTB-3.5 | T-15F |

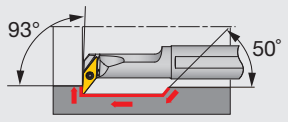
A/E-SDUCR/L: Inserts → **B114 -**, CBN → **B168 -**, PCD → **B177**

A/E-SVUBR/L: Inserts → **B142 -**, CBN → **B169 -**

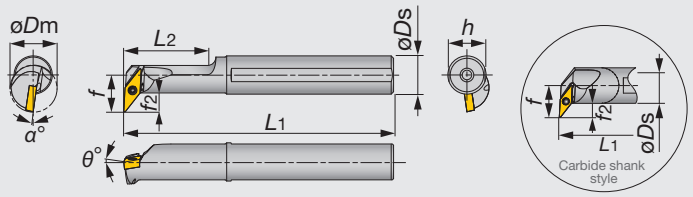
# STREAMJETBAR

## A/E-SVUCR/L

Screw-on boring bars, for positive 35° rhombic inserts




Cutting edge style **U**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A12M-SVUCR/L08-D160 | STEEL | 16 | 12 | 11 | 150 | 30 | 11 | 5.5 | 0 | -8 | 0.4 | VC**0802... | 0.6 |
| A25S-SVUCR/L16-D320 | STEEL | 32 | 25 | 19 | 250 | 45 | 23 | 6.5 | 0 | -5 | 0.8 | VC**1604... | 3 |
| E12Q-SVUCR/L08-D180 | CARBIDE | 18 | 12 | 11.5 | 180 | - | 11 | 5.5 | 0 | -8 | 0.4 | VC**0802... | 0.6 |
| E25T-SVUCR/L16-D320 | CARBIDE | 32 | 25 | 19 | 300 | - | 23 | 6.5 | 0 | -5 | 0.8 | VC**1604... | 3 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (SVUCL** type), and the left hand insert (L) is used for the right hand toolholders (SVUCR** type).

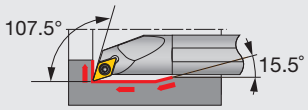
### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| A12M-SVUCR/L08-D160 | CSTB-2L | T-6F |
| A25S-SVUCR/L16-D320 | CSTB-3.5 | T-15F |
| E12Q-SVUCR/L08-D180 | CSTB-2L | T-6F |
| E25T-SVUCR/L16-D320 | CSTB-3.5 | T-15F |

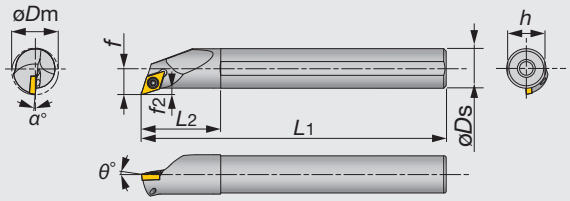
# STREAMJETBAR

## A/E-SDQCR/L

Screw-on boring bars, for positive 55° rhombic inserts




Cutting edge style **Q**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A10K-SDQCR/L07-D130 | STEEL | 13 | 10 | 7.6 | 125 | 20 | 9 | 2.6 | 0 | -8 | 0.4 | DC**0702... | 1.2 |
| A12M-SDQCR/L07-D160 | STEEL | 16 | 12 | 8.6 | 150 | 24 | 11 | 2.6 | 0 | -6 | 0.4 | DC**0702... | 1.2 |
| A16Q-SDQCR/L07-D200 | STEEL | 20 | 16 | 10.6 | 180 | 32 | 15 | 2.6 | 0 | -5 | 0.4 | DC**0702... | 1.2 |
| A20R-SDQCR/L11-D250 | STEEL | 25 | 20 | 13.7 | 200 | 36 | 18 | 3.7 | 0 | -7 | 0.8 | DC**11T3... | 3 |
| A25S-SDQCR/L11-D300 | STEEL | 30 | 25 | 16.2 | 250 | 45 | 23 | 3.7 | 0 | -4 | 0.8 | DC**11T3... | 3 |
| E10H-SDQCR07-D130 | CARBIDE | 13 | 10 | 7.6 | 100 | 25 | 9 | 2.5 | 0 | -8 | 0.4 | DC**0702... | 1.2 |
| E10M-SDQCR/L07-D130 | CARBIDE | 13 | 10 | 7.6 | 150 | 25 | 9 | 2.6 | 0 | -8 | 0.4 | DC**0702... | 1.2 |
| E12J-SDQCR07-D160 | CARBIDE | 16 | 12 | 8.6 | 110 | 27 | 11 | 2.5 | 0 | -6 | 0.4 | DC**0702... | 1.2 |
| E12Q-SDQCR/L07-D160 | CARBIDE | 16 | 12 | 8.6 | 180 | 27 | 11 | 2.6 | 0 | -6 | 0.4 | DC**0702... | 1.2 |
| E16L-SDQCR07-D200 | CARBIDE | 20 | 16 | 10.6 | 130 | 32 | 15 | 2.5 | 0 | -5 | 0.4 | DC**0702... | 1.2 |
| E16R-SDQCR/L07-D200 | CARBIDE | 20 | 16 | 10.6 | 200 | 32 | 15 | 2.6 | 0 | -5 | 0.4 | DC**0702... | 1.2 |
| E20S-SDQCR/L11-D250 | CARBIDE | 25 | 20 | 13.7 | 250 | 36 | 18 | 3.7 | 0 | -7 | 0.8 | DC**11T3... | 3 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (SDQCL** type), and the left hand insert (L) is used for the right hand toolholders (SDQCR** type).

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| A1**-SDQCR/L07-D**0 | CSTB-2.5S | T-8F |
| A2**-SDQCR/L11-D**0 | CSTB-4S | T-15F |
| E1**-SDQCR/L07-D**0 | CSTB-2.5S | T-8F |
| E20S-SDQCR/L11-D250 | CSTB-4S | T-15F |

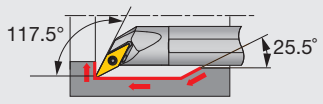
A/E-SVUCR/L: Inserts → **B145 -**, CBN → **B169 -**, PCD → **B177 -**

A/E-SDQCR/L: Inserts → **B114 -**, CBN → **B168 -**, PCD → **B177**

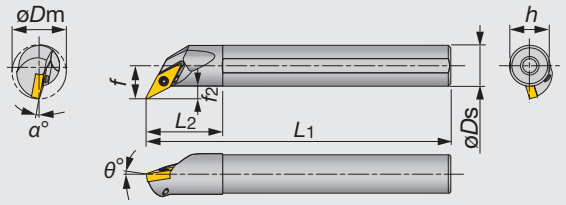
# STREAMJETBAR

## A/E-SVQBR/L

Screw-on boring bars, for positive 35° rhombic inserts




Cutting edge style **Q**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A12M-SVQBR/L11-D170 | STEEL | 17 | 12 | 10.5 | 150 | 24 | 11 | 4.5 | -5 | -10 | 0.4 | VB**1103... | 1.2 |
| A16Q-SVQBR/L11-D215 | STEEL | 21.5 | 16 | 13 | 180 | 30 | 15 | 5 | -5 | -8 | 0.4 | VB**1103... | 1.2 |
| A20R-SVQBR/L11-D255 | STEEL | 25.5 | 20 | 15 | 200 | 36 | 18 | 5 | -5 | -6 | 0.4 | VB**1103... | 1.2 |
| A25S-SVQBR/L16-D305 | STEEL | 30.5 | 25 | 17.5 | 250 | 45 | 23 | 5 | -5 | -8 | 0.8 | VB**1604... | 3 |
| E12Q-SVQBR/L11-D170 | CARBIDE | 17 | 12 | 10.5 | 180 | 27 | 11 | 4.5 | -5 | -10 | 0.4 | VB**1103... | 1.2 |
| E16R-SVQBR/L11-D215 | CARBIDE | 21.5 | 16 | 13 | 200 | 32 | 15 | 5 | -5 | -8 | 0.4 | VB**1103... | 1.2 |
| E20S-SVQBR/L11-D255 | CARBIDE | 25.5 | 20 | 15 | 250 | 36 | 18 | 5 | -5 | -6 | 0.4 | VB**1103... | 1.2 |
| E25T-SVQBR/L16-D305 | CARBIDE | 30.5 | 25 | 17.5 | 300 | 45 | 23 | 5 | -5 | -8 | 0.8 | VB**1604... | 3 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (SVQBL type), and the left hand insert (L) is used for the right hand toolholders (SVQBR type).

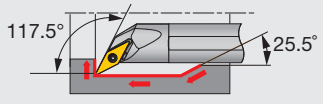
### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| A**-SVQBR/L11-D... | CSTB-2.5 | T-8F |
| A25S-SVQBR/L16-D305 | CSTB-3.5 | T-15F |
| E**-SVQBR/L11-D... | CSTB-2.5 | T-8F |
| E25T-SVQBR/L16-D305 | CSTB-3.5 | T-15F |

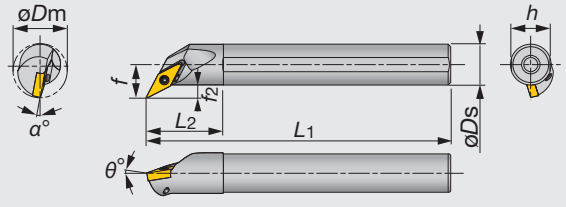
# STREAMJETBAR

## A/E-SVQCR/L

Screw-on boring bars, for positive 35° rhombic inserts




Cutting edge style **Q**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A10K-SVQCR/L08-D135 | STEEL | 13.5 | 10 | 8 | 125 | 20 | 9 | 3 | -5 | -8 | 0.4 | VC**0802... | 0.6 |
| A16Q-SVQCR/L11-D215 | STEEL | 21.5 | 16 | 13 | 180 | 30 | 15 | 4.9 | -5 | -8 | 0.4 | VC**1103... | 1.2 |
| E10M-SVQCR/L08-D135 | CARBIDE | 13.5 | 10 | 8 | 150 | 25 | 9 | 3 | -5 | -8 | 0.4 | VC**0802... | 0.6 |
| E16R-SVQCR/L11-D215 | CARBIDE | 21.5 | 16 | 13 | 200 | 32 | 15 | 4.9 | -5 | -8 | 0.4 | VC**1103... | 1.2 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (SVQCL ** type), and the left hand insert (L) is used for the right hand toolholders (SVQCR ** type).

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| A10K-SVQCR/L08-D135 | CSTB-2L | T-6F |
| A16Q-SVQCR/L11-D215 | CSTB-2.5 | T-8F |
| E10M-SVQCR/L08-D135 | CSTB-2L | T-6F |
| E16R-SVQCR/L11-D215 | CSTB-2.5 | T-8F |

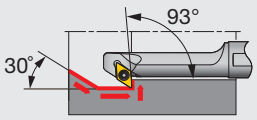
A/E-SVQBR/L: Inserts → **B142 -**, CBN → **B169 -**

A/E-SVQCR/L: Inserts → **B145 -**

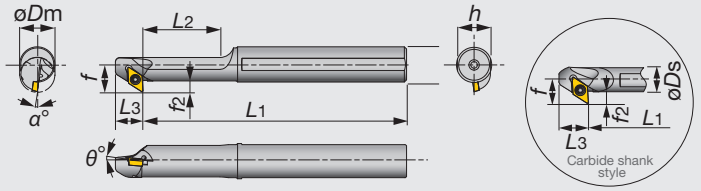
# A/E-SDZCR/L

Screw-on boring bars, for positive 55° rhombic inserts






Cutting edge style **Z**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | L3 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A12M-SDZCR/L07-D140 | STEEL | 14 | 12 | 10.5 | 150 | 30 | 12.5 | 11 | 4.5 | 0 | -9 | 0.4 | DC**0702... | 1.2 |
| A16Q-SDZCR/L07-D160 | STEEL | 16 | 16 | 12.5 | 180 | 35 | 12.5 | 15 | 4.5 | 0 | -8 | 0.4 | DC**0702... | 1.2 |
| A20R-SDZCR/L11-D200 | STEEL | 20 | 20 | 15.5 | 200 | 40 | 15.0 | 18 | 5.5 | 0 | -8 | 0.8 | DC**11T3... | 3 |
| A25S-SDZCR/L11-D250 | STEEL | 25 | 25 | 18 | 250 | 50 | 15 | 23 | 5.5 | 0 | -6 | 0.8 | DC**11T3... | 3 |
| E12Q-SDZCR/L07-D180 | CARBIDE | 18 | 12 | 10.5 | 180 | - | 12.5 | 11 | 4.5 | 0 | -8 | 0.4 | DC**0702... | 1.2 |
| E16R-SDZCR/L07-D220 | CARBIDE | 22 | 16 | 12.5 | 200 | - | 12.5 | 15 | 4.5 | 0 | -6 | 0.4 | DC**0702... | 1.2 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius

Note: When using a right or left hand insert, the right hand insert (R) is used for the right hand toolholders (SDZCR ** type), and the left hand insert (L) is used for the left hand toolholders (SDZCL ** type).

## SPARE PARTS





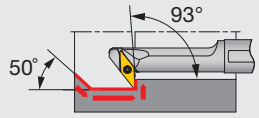
| Designation | Clamping screw | Wrench |
|---|---|---|
| A1**-SDZCR/L07-D1*0 | CSTB-2.5 | T-8F |
| A2**-SDZCR/L11-D2*0 | CSTB-4S | T-15F |
| E1**-SDZCR/L07-D**0 | CSTB-2.5 | T-8F |

A/E-SDZCR/L: Inserts → **B114 -**, CBN → **B168 -**, PCD → **B177**

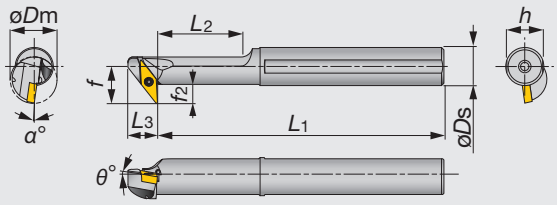
# STREAMJETBAR

## A-SVZBR/L

Screw-on boring bars, for positive 35° rhombic inserts




Cutting edge style **Z**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | L3 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A16Q-SVZBR/L11-D200 | STEEL | 20 | 16 | 15.5 | 180 | 35 | 12.5 | 15 | 8 | 0 | -8 | 0.4 | VB**1103... | 1.2 |
| A20R-SVZBR/L11-D250 | STEEL | 25 | 20 | 17.5 | 200 | 40 | 12.5 | 18 | 8 | 0 | -7 | 0.4 | VB**1103... | 1.2 |
| A25S-SVZBR/L16-D320 | STEEL | 32 | 25 | 24 | 250 | 50 | 17.5 | 23 | 12 | 0 | -6 | 0.8 | VB**1604... | 3 |
| A32T-SVZBR/L16-D400 | STEEL | 40 | 32 | 27.5 | 300 | 72 | 17.5 | 30 | 12 | 0 | -5 | 0.8 | VB**1604... | 3 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert (R) is used for the right hand toolholders (SVZBR type), and the left hand insert (L) is used for the left hand toolholders (SVZBL type).

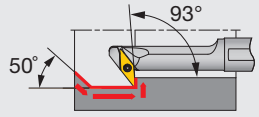
### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| A**-SVZBR/L11-D2*0 | CSTB-2.5 | T-8F |
| A25S-SVZBR/L16-D320 | CSTB-3.5 | T-15F |
| A32T-SVZBR/L16-D400 | CSTB-3.5L | T-15F |

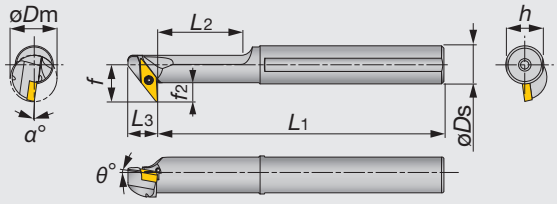
# STREAMJETBAR

## A-SVZCR/L

Screw-on boring bars, for positive 35° rhombic inserts




Cutting edge style **Z**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | L3 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A12M-SVZCR/L08-D160 | STEEL | 16 | 12 | 11 | 150 | 30 | 10 | 11 | 5.5 | 0 | -8 | 0.4 | VC**0802... | 0.6 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert (R) is used for the right hand toolholders (SVZCR ** type), and the left hand insert (L) is used for the left hand toolholders (SVZCL ** type).

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| A12M-SVZCR/L08-D160 | CSTB-2L | T-6F |

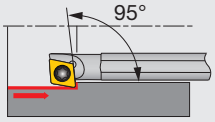
A-SVZBR/L: Inserts → **B142 -**, CBN → **B169 -**

A-SVZCR/L: Inserts → **B145 -**

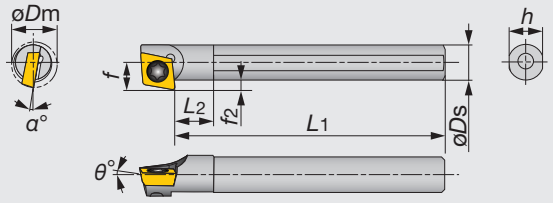
# STREAMJETBAR

## A/E-SEZPR/L

Screw-on boring bars, for positive 75° rhombic inserts




Cutting edge style **Z**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A04F-SEZPR/L03-D055 | STEEL | 5.5 | 4 | 3.2 | 80 | 4 | 3.8 | 1.2 | 0 | -8 | 0.2 | EP**03X1... | 0.6 |
| A05F-SEZPR/L03-D065 | STEEL | 6.5 | 5 | 3.7 | 80 | 5 | 4.8 | 1.2 | 0 | -6 | 0.2 | EP**03X1... | 0.6 |
| E04G-SEZPR/L03-D055 | CARBIDE | 5.5 | 4 | 3.2 | 90 | 5 | 3.8 | 1.2 | 0 | -8 | 0.2 | EP**03X1... | 0.6 |
| E05G-SEZPR/L03-D065 | CARBIDE | 6.5 | 5 | 3.7 | 90 | 6 | 4.8 | 1.2 | 0 | -6 | 0.2 | EP**03X1... | 0.6 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert (R) is used for the right hand toolholders (SEZPR ** type), and the left hand insert (L) is used for the left hand toolholders (SEZPL ** type).

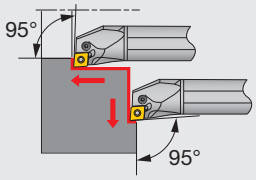
### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| A**-SEZPR/L03-D... | CSTA-1.6 | T-6F |
| E**-SEZPR/L03-D... | CSTA-1.6 | T-6F |

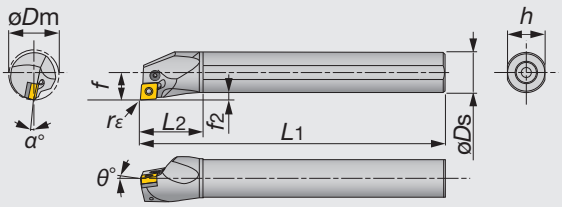
# STREAMJETBAR

## A-PCLNR/L

Lever-lock boring bars, for negative 80° rhombic inserts




Cutting edge style **L**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A16M-PCLNR/L09-D200 | STEEL | 20 | 16 | 11 | 150 | 32 | 15 | 3 | -6 | -14 | 0.8 | CN**0903... | 1.7 |
| A20Q-PCLNR/L09-D250 | STEEL | 25 | 20 | 13 | 180 | 36 | 18 | 3 | -6 | -12 | 0.8 | CN**0903... | 1.7 |
| A25R-PCLNR/L09-D320 | STEEL | 32 | 25 | 17 | 200 | 45 | 23 | 4.5 | -6 | -11 | 0.8 | CN**0903... | 1.7 |
| A25R-PCLNR/L12-D320 | STEEL | 32 | 25 | 17 | 200 | 45 | 23 | 4.5 | -6 | -13 | 0.8 | CN**1204... | 2.7 |
| A32S-PCLNR/L12-D400 | STEEL | 40 | 32 | 22 | 250 | 50 | 30 | 6 | -6 | -11 | 0.8 | CN**1204... | 4.8 |
| A40T-PCLNR/L12-D500 | STEEL | 50 | 40 | 27 | 300 | 60 | 37 | 7 | -6 | -10 | 0.8 | CN**1204... | 4.8 |
| A50U-PCLNR/L12-D630 | STEEL | 63 | 50 | 35 | 350 | 65 | 47 | 10 | -6 | -8 | 0.8 | CN**1204... | 4.8 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (PCLNL ** type), and the left hand insert (L) is used for the right hand toolholders (PCLNR ** type).

### SPARE PARTS

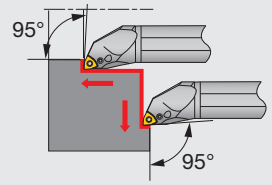
| Designation | Shim | Clamping screw 1 | Clamping screw 2 | Wrench 1 | Wrench 2 | Spring | Lever |
|---|---|---|---|---|---|---|---|
| A**-PCLNR/L09-D**0 | - | LCS22A | - | P-2F | - | - | LCL32N |
| A25R-PCLNR/L12-D320 | - | LCS43 | - | - | P-2.5 | - | LCL43N |
| A32S-PCLNR12-D400 | LSC42BR | - | LCS4 | - | P-3 | LSP4 | LCL4 |
| A32S-PCLNL12-D400 | LSC42BL | - | LCS4 | - | P-3 | LSP4 | LCL4 |
| A40T-PCLNR12-D500 | LSC42BR | - | LCS4 | - | P-3 | LSP4 | LCL4 |
| A40T-PCLNL12-D500 | LSC42BL | - | LCS4 | - | P-3 | LSP4 | LCL4 |
| A50U-PCLNR12-D630 | LSC42BR | - | LCS4 | - | P-3 | LSP4 | LCL4 |
| A50U-PCLNL12-D630 | LSC42BL | - | LCS4 | - | P-3 | LSP4 | LCL4 |

A/E-SEZPR/L: Inserts → **B120 -**, CBN → **B171**

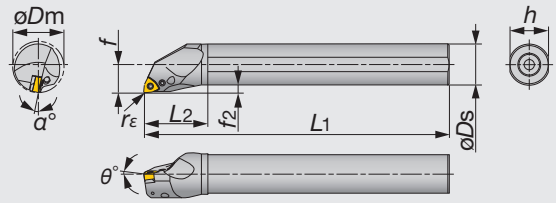
A-PCLNR/L: Inserts → **B050 -**, CBN → **B163 -**, PCD → **B176**

## A-PWLNR/L

Lever-lock boring bars, for negative trigon inserts




Cutting edge style **L**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A16M-PWLNR/L06-D200 | STEEL | 20 | 16 | 11 | 150 | 32 | 15 | 3 | -8 | -17 | 0.8 | WN**0604... | 1.7 |
| A20Q-PWLNR/L06-D250 | STEEL | 25 | 20 | 13 | 180 | 36 | 18 | 3 | -6 | -14 | 0.8 | WN**0604... | 1.7 |
| A25R-PWLNR/L06-D320 | STEEL | 32 | 25 | 17 | 200 | 45 | 23 | 4.5 | -6 | -12 | 0.8 | WN**0604... | 2.7 |
| A32S-PWLNR/L06-D400 | STEEL | 40 | 32 | 22 | 250 | 50 | 30 | 6 | -6 | -11 | 0.8 | WN**0604... | 2.7 |
| A25R-PWLNR/L08-D320 | STEEL | 32 | 25 | 17 | 200 | 45 | 23 | 4.5 | -6 | -13 | 0.8 | WN**0804... | 2.7 |
| A32S-PWLNR/L08-D400 | STEEL | 40 | 32 | 22 | 250 | 50 | 30 | 6 | -6 | -11 | 0.8 | WN**0804... | 4.8 |
| A40T-PWLNR/L08-D500 | STEEL | 50 | 40 | 27 | 300 | 60 | 37 | 7 | -6 | -10 | 0.8 | WN**0804... | 4.8 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

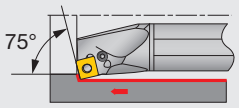
### SPARE PARTS

| Designation | Shim | Clamping screw 1 | Clamping screw 2 | Wrench 1 | Wrench 2 | Spring | Lever | Oil supply attachment | Screw for oil hole |
|---|---|---|---|---|---|---|---|---|---|
| A16M-PWLNR/L06-D200 | - | LCS33 | - | P-2F | - | - | LCL33N | - | SSHM3-4 |
| A20Q-PWLNR/L06-D250 | - | LCS33 | - | P-2F | - | - | LCL33N | EA-20 | SSHM3-4 |
| A25R-PWLNR/L06-D320 | LSW312BR/L | - | LCS3B | - | P-2.5 | LSP3 | LCL3 | EA-25 | SSHM4-5 |
| A32S-PWLNR/L06-D400 | LSW312BR/L | - | LCS3 | - | P-2.5 | LSP3 | LCL3 | EA-32 | SSHM4-5 |
| A25R-PWLNR/L08-D320 | - | LCS43 | - | - | P-2.5 | - | LCL43N | EA-25 | SSHM4-5 |
| A32S-PWLNR/L08-D400 | LSW42BR/L | - | LCS4 | - | P-3 | LSP4 | LCL4 | EA-32 | SSHM4-5 |
| A40T-PWLNR/L08-D500 | LSW42BR/L | - | LCS4 | - | P-3 | LSP4 | LCL4 | - | SSHM4-5 |

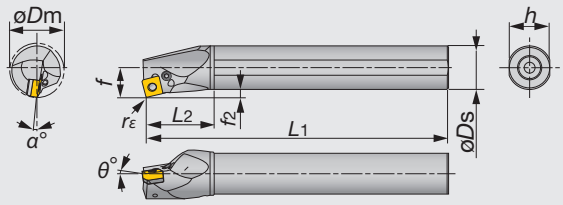


## A-PSKNR/L

Lever-lock boring bars, for negative square inserts




Cutting edge style **K**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A32S-PSKNR/L12-D400 | STEEL | 40 | 32 | 22 | 250 | 50 | 30 | 6 | -6 | -10 | 0.8 | SN**1204... | 4.8 |
| A40T-PSKNR/L12-D500 | STEEL | 50 | 40 | 27 | 300 | 60 | 37 | 7 | -6 | -10 | 0.8 | SN**1204... | 4.8 |
| A50U-PSKNR/L12-D630 | STEEL | 63 | 50 | 35 | 350 | 65 | 47 | 10 | -6 | -8 | 0.8 | SN**1204... | 4.8 |

*Torque: Recommended torque (N·m) for clamping **$r_\varepsilon$: Standard corner radius
Note: When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (PSKNL ** type), and the left hand insert (L) is used for the right hand toolholders (PSKNR ** type).

### SPARE PARTS

| Designation | Shim | Clamping screw | Wrench | Spring | Lever | Oil supply attachment | Screw for oil hole |
|---|---|---|---|---|---|---|---|
| A32S-PSKNR/L12-D400 | LSS42BR/L | LCS4 | P-3 | LSP4 | LCL4 | EA-32 | SSHM4-5 |
| A40T-PSKNR/L12-D500 | LSS42BR/L | LCS4 | P-3 | LSP4 | LCL4 | - | SSHM6-6 |
| A50U-PSKNR/L12-D630 | LSS42BR/L | LCS4 | P-3 | LSP4 | LCL4 | - | SSHM6-6 |

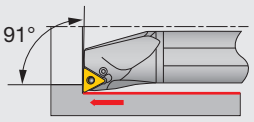
A-PWLNR/L: Inserts → **B090 -**, CBN → **B165**

A-PSKNR/L: Inserts → **B070 -**, CBN → **B164 -**, PCD → **B176**

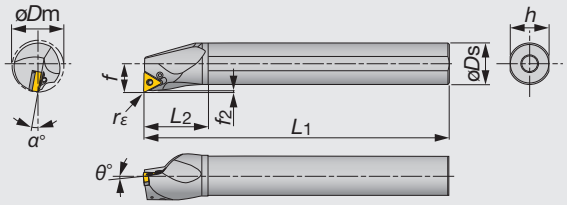
# A-PTFNR/L

## Lever-lock boring bars, for negative triangle inserts






Cutting edge style **F**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A25R-PTFNR/L16-D320 | STEEL | 32 | 25 | 17 | 200 | 45 | 23 | 1.2 | -6 | -12 | 0.8 | TN**1604... | 2.7 |
| A32S-PTFNR/L16-D400 | STEEL | 40 | 32 | 22 | 250 | 50 | 30 | 1.1 | -6 | -10 | 0.8 | TN**1604... | 2.7 |
| A40T-PTFNR/L16-D500 | STEEL | 50 | 40 | 27 | 300 | 60 | 37 | 1.1 | -6 | -10 | 0.8 | TN**1604... | 2.7 |
| A50U-PTFNR/L16-D630 | STEEL | 63 | 50 | 35 | 350 | 65 | 47 | 1.1 | -6 | -8 | 0.8 | TN**1604... | 2.7 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (PTFNL ** type), and the left hand insert (L) is used for the right hand toolholders (PTFNR ** type).

## SPARE PARTS

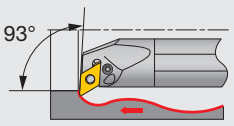
| Designation | Shim | Clamping screw | Wrench | Spring | Lever | Oil supply attachment | Screw for oil hole |
|---|---|---|---|---|---|---|---|
| A25R-PTFNR/L16-D320 | ELST317BR/L | LCS3 | P-2.5 | LSP3 | LCL33 | EA-25 | SSHM4-5 |
| A32S-PTFNR/L16-D400 | LST317BR/L | LCS3 | P-2.5 | LSP3 | LCL3 | EA-32 | SSHM4-5 |
| A40T-PTFNR/L16-D500 | LST317BR/L | LCS3 | P-2.5 | LSP3 | LCL3 | - | SSHM6-6 |
| A50U-PTFNR/L16-D630 | LST317BR/L | LCS3 | P-2.5 | LSP3 | LCL3 | - | SSHM6-6 |

A-PTFNR/L: Inserts → **B079 -**, CBN → **B164 -**, PCD → **B176**

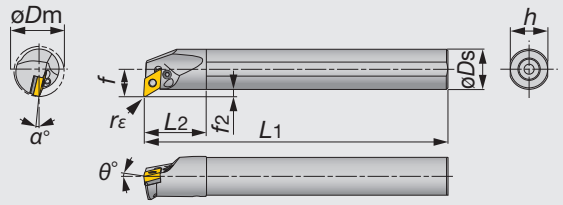
# STREAMJETBAR

## A-PDUNR/L

Lever-lock boring bars, for negative 55° rhombic inserts




Cutting edge style **U**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A20Q-PDUNR/L11-D250 | STEEL | 25 | 20 | 13 | 180 | 36 | 18 | 3 | -6 | -14 | 0.8 | DN**1104... | 1.7 |
| A25R-PDUNR/L11-D320 | STEEL | 32 | 25 | 17 | 200 | 45 | 23 | 4.5 | -6 | -12 | 0.8 | DN**1104... | 2.7 |
| A32S-PDUNR/L15-D400 | STEEL | 40 | 32 | 22 | 250 | 50 | 30 | 6 | -6 | -13 | 0.8 | DN**1504... | 4.8 |
| A40T-PDUNR/L15-D500 | STEEL | 50 | 40 | 27 | 300 | 60 | 37 | 7 | -6 | -10 | 0.8 | DN**1504... | 4.8 |
| A50U-PDUNR/L15-D630 | STEEL | 63 | 50 | 35 | 350 | 65 | 47 | 10 | -6 | -8 | 0.8 | DN**1504... | 4.8 |
| A32S-PDUNR/L1506-D400 | STEEL | 40 | 32 | 22 | 250 | 50 | 30 | 6 | -6 | -13 | 0.8 | DN**1506... | 4.8 |
| A40T-PDUNR/L1506-D500 | STEEL | 50 | 40 | 27 | 300 | 60 | 37 | 7 | -6 | -11 | 0.8 | DN**1506... | 4.8 |
| A50U-PDUNR/L1506-D630 | STEEL | 63 | 50 | 35 | 350 | 65 | 47 | 10 | -6 | -10 | 0.8 | DN**1506... | 4.8 |

*Torque: Recommended torque (N·m) for clamping
**rε: Standard corner radius

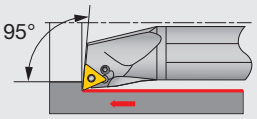
### SPARE PARTS

| Designation | Shim | Clamping screw 1 | Clamping screw 2 | Wrench 1 | Wrench 2 | Spring | Lever | Oil supply attachment | Screw for oil hole |
|---|---|---|---|---|---|---|---|---|---|
| A20Q-PDUNR/L11-D250 | - | LCS22A | - | P-2F | - | - | LCL33NL | EA-20 | SSHM2.5-3 |
| A25R-PDUNR/L11-D320 | ELSD317BR/L | - | LCS3 | - | P-2.5 | LSP3 | LCL33L | EA-25 | SSHM3-4 |
| A32S-PDUNR/L15-D400 | LSD42BR/L | - | LCS4 | - | P-3 | LSP4 | LCL4 | EA-32 | SSHM5-6 |
| A40T-PDUNR/L15-D500 | LSD42BR/L | - | LCS4 | - | P-3 | LSP4 | LCL4 | - | SSHM6-6 |
| A50U-PDUNR/L15-D630 | LSD42BR/L | - | LCS4 | - | P-3 | LSP4 | LCL4 | - | SSHM6-6 |
| A32S-PDUNR/L1506-D400 | ELSD42 | - | ELCS4 | - | P-3 | LSP4S | LCL44 | EA-20 | SSHM5-6 |
| A40T-PDUNR/L1506-D500 | ELSD42 | - | ELCS4 | - | P-3 | LSP4S | LCL44 | - | SSHM6-6 |
| A50U-PDUNR/L1506-D630 | ELSD42 | - | ELCS4 | - | P-3 | LSP4S | LCL44 | - | SSHM6-6 |

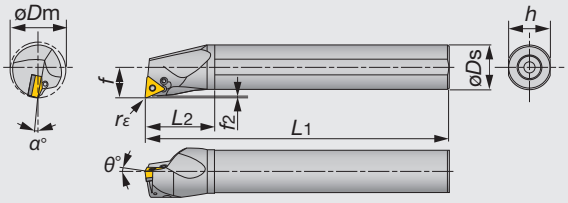
# STREAMJETBAR

## A-PTUNR/L

Lever-lock boring bars, for negative triangle inserts




Cutting edge style **U**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A16M-PTUNR/L11-D200 | STEEL | 20 | 16 | 11 | 150 | 32 | 15 | 1 | -6 | -14 | 0.4 | TN**1103... | 1.7 |
| A20Q-PTUNR/L11-D250 | STEEL | 25 | 20 | 13 | 180 | 36 | 18 | 1 | -6 | -12 | 0.4 | TN**1103... | 1.7 |
| A25R-PTUNR/L16-D320 | STEEL | 32 | 25 | 17 | 200 | 45 | 23 | 1.4 | -6 | -12 | 0.8 | TN**1604... | 2.7 |
| A32S-PTUNR/L16-D400 | STEEL | 40 | 32 | 22 | 250 | 50 | 30 | 1.3 | -6 | -10 | 0.8 | TN**1604... | 2.7 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: The insert hole conforms to the ISO standard.
Tool holder length may be different to the ISO standard.
When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (PTUNL ** type), and the left hand insert (L) is used for the right hand toolholders (PTUNR ** type).

### SPARE PARTS

| Designation | Shim | Clamping screw1 | Clamping screw2 | Wrench 1 | Wrench 2 | Spring | Lever | Oil supply attachment | Screw for oil hole |
|---|---|---|---|---|---|---|---|---|---|
| A16M-PTUNR/L11-D200 | - | LCS22A | - | P-2F | - | - | LCL22N | - | SSHM3-4 |
| A20Q-PTUNR/L11-D250 | - | LCS22A | - | P-2F | - | - | LCL22N | EA20 | SSHM3-4 |
| A25R-PTUNR/L16-D320 | ELST317BR/L | - | LCS3 | - | P-2.5 | LSP3 | LCL33 | EA25 | SSHM4-5 |
| A32S-PTUNR/L16-D400 | LST317BR/L | - | LCS3 | - | P-2.5 | LSP3 | LCL3 | EA32 | SSHM4-5 |

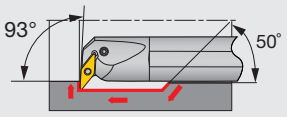

A-PDUNR/L: Inserts → **B061 -**, CBN → **B163 -**, PCD → **B176**

A-PTUNR/L: Inserts → **B079 -**, CBN → **B164 -**, PCD → **B176**

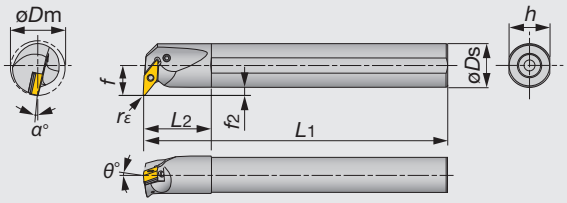
# STREAMJETBAR

## A-PVUNR/L

Lever-lock boring bars, for negative 35° rhombic inserts




Cutting edge style **U**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A25R-PVUNR/L16-D370 | STEEL | 37 | 25 | 22 | 200 | 45 | 23 | 9.5 | -5 | -14 | 0.8 | V/YN**1604... | 2.7 |
| A32S-PVUNR/L16-D400 | STEEL | 40 | 32 | 22 | 250 | 50 | 30 | 6 | -5 | -12 | 0.8 | V/YN**1604... | 2.7 |
| A40T-PVUNR/L16-D500 | STEEL | 50 | 40 | 27 | 300 | 60 | 37 | 7 | -5 | -10 | 0.8 | V/YN**1604... | 2.7 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

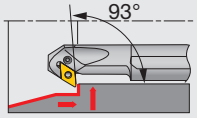
### SPARE PARTS

| Designation | Shim | Clamping screw | Wrench | Spring | Lever | Oil supply attachment | Screw for oil hole |
|---|---|---|---|---|---|---|---|
| A25R-PVUNR/L16-D370 | LSV317BR/L | LCS3V | P-2.5 | LSP3 | LCL3V | EA-25 | SSHM4-5 |
| A32S-PVUNR/L16-D400 | LSV317BR/L | LCS3V | P-2.5 | LSP3 | LCL3V | EA-32 | SSHM4-5 |
| A40T-PVUNR/L16-D500 | LSV317BR/L | LCS3V | P-2.5 | LSP3 | LCL3V | - | SSHM5-6 |

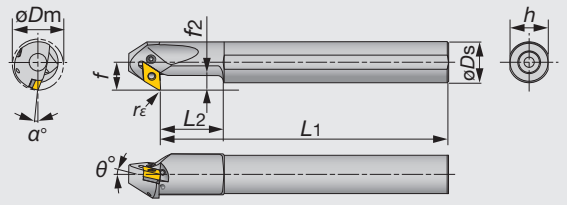
# STREAMJETBAR

## A-PDZNR/L

Lever-lock boring bars, for negative 55° rhombic inserts




Cutting edge style **Z**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A32S-PDZNR/L15-D400 | STEEL | 40 | 32 | 22 | 250 | 50 | 30 | 11.5 | -6 | -13 | 0.8 | DN**1504... | 4.8 |
| A40T-PDZNR/L15-D500 | STEEL | 50 | 40 | 27 | 300 | 60 | 37 | 14.5 | -6 | -10 | 0.8 | DN**1504... | 4.8 |
| A50U-PDZNR/L15-D630 | STEEL | 63 | 50 | 35 | 350 | 65 | 47 | 14.5 | -6 | -8 | 0.8 | DN**1504... | 4.8 |

*Torque: Recommended torque (N·m) for clamping **$r_\varepsilon$: Standard corner radius
Note: When using a right or left hand insert, the right hand insert (R) is used for the right hand toolholders (PDZNR** type), and the left hand insert (L) is used for the left hand toolholders (PDZNL** type).

### SPARE PARTS

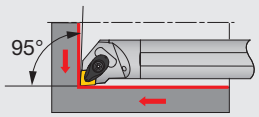
| Designation | Shim | Clamping screw | Wrench | Spring | Lever | Oil supply attachment | Screw for oil hole |
|---|---|---|---|---|---|---|---|
| A32S-PDZNR15-D400 | LSZ42BR | LCS4 | P-3 | LSP4 | LCL4 | EA-32 | SSHM4-5 |
| A32S-PDZNL15-D400 | LSZ42BL | LCS4 | P-3 | LSP4 | LCL4 | EA-32 | SSHM4-5 |
| A40T-PDZNR15-D500 | LSZ42BR | LCS4 | P-3 | LSP4 | LCL4 | - | SSHM5-6 |
| A40T-PDZNL15-D500 | LSZ42BL | LCS4 | P-3 | LSP4 | LCL4 | - | SSHM5-6 |
| A50U-PDZNR15-D630 | LSZ42BR | LCS4 | P-3 | LSP4 | LCL4 | - | SSHM6-6 |
| A50U-PDZNL15-D630 | LSZ42BL | LCS4 | P-3 | LSP4 | LCL4 | - | SSHM6-6 |

A-PVUNR/L: Inserts → **B097 -**, CBN → **B165 -**, PCD → **B176**

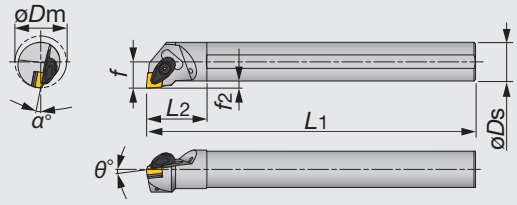
A-PDZNR/L: Inserts → **B061 -**, CBN → **B163 -**, PCD → **B176**

## A-ACLNR/L

Double-clamp boring bar, for negative 80° rhombic inserts




Cutting edge style **L**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A25R-ACLNR/L12-D320 | STEEL | 32 | 25 | 17 | 200 | 45 | 23 | 4.5 | -6 | -13 | 0.8 | CN**1204... | 3 |
| A32S-ACLNR/L12-D400 | STEEL | 40 | 32 | 22 | 250 | 50 | 30 | 6 | -6 | -10 | 0.8 | CN**1204... | 3 |
| A40T-ACLNR/L12-D500 | STEEL | 50 | 40 | 27 | 300 | 55 | 37 | 7 | -6 | -8 | 0.8 | CN**1204... | 3 |
| A50U-ACLNR12-D630 | STEEL | 63 | 50 | 35 | 350 | 65 | 47 | 10 | -6 | -7 | 0.8 | CN**1204... | 3 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

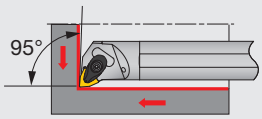
**SPARE PARTS**

| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|---|---|
| A**-ACLNR/L12-D... | ACP4S | ACS-5W | BP-7 | SP-2.5 | ASC422 | CSTB-3.5 | T-15F |

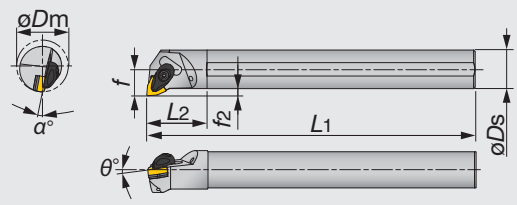


## A-AWLNR/L

Double-clamp boring bar, for negative trigon inserts




Cutting edge style **L**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A25R-AWLNR/L06-D320 | STEEL | 32 | 25 | 17 | 200 | 45 | 23 | 4.5 | -6 | -13 | 0.8 | WN**0604... | 3 |
| A32S-AWLNR/L06-D400 | STEEL | 40 | 32 | 22 | 250 | 50 | 30 | 6 | -6 | -10 | 0.8 | WN**0604... | 3 |
| A25R-AWLNR/L08-D320 | STEEL | 32 | 25 | 17 | 200 | 45 | 23 | 4.5 | -6 | -13 | 0.8 | WN**0804... | 3 |
| A32S-AWLNR/L08-D400 | STEEL | 40 | 32 | 22 | 250 | 50 | 30 | 6 | -6 | -10 | 0.8 | WN**0804... | 3 |
| A40T-AWLNR/L08-D500 | STEEL | 50 | 40 | 27 | 300 | 55 | 37 | 7 | -6 | -8 | 0.8 | WN**0804... | 3 |
| A50U-AWLNR/L08-D630 | STEEL | 63 | 50 | 35 | 350 | 65 | 47 | 10 | -6 | -7 | 0.8 | WN**0804... | 3 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|---|---|
| A**-AWLNR/L06-D... | ACP3S | ACS-5W | BP-7 | SP-2.5 | ASW322 | CSTB-3.5 | T-15F |
| A**-AWLNR/L08-D... | ACP4S | ACS-5W | BP-7 | SP-2.5 | ASW422 | CSTB-3.5 | T-15F |

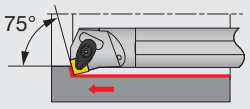
A-ACLNR/L: Inserts → **B050 -**, CBN → **B163 -**, PCD → **B176**

A-AWLNR/L: Inserts → **B090 -**, CBN → **B165**

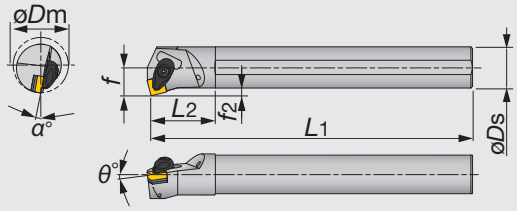
# TURNINGA

## A-ASKNR/L

Double-clamp boring bar, for negative square inserts




Cutting edge style **K**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A25R-ASKNR/L12-D320 | STEEL | 32 | 25 | 17 | 200 | 45 | 23 | 4.5 | -6 | -13 | 0.8 | SN**1204... | 3 |
| A32S-ASKNR/L12-D400 | STEEL | 40 | 32 | 22 | 250 | 50 | 30 | 6 | -6 | -10 | 0.8 | SN**1204... | 3 |

*Torque: Recommended torque (N·m) for clamping
**rε: Standard corner radius

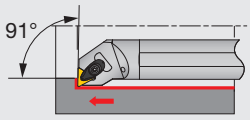
### SPARE PARTS

| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|---|---|
| A**-ASKN*12-D... | ACP4S | ACS-5W | BP-7 | SP-2.5 | ASS422 | CSTB-3.5 | T-15F |

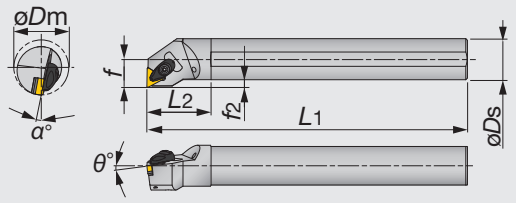
# TURNINGA

## A-ATFNR/L

Double-clamp boring bar, for negative triangle inserts




Cutting edge style **F**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A25R-ATFNR/L16-D320 | STEEL | 32 | 25 | 17 | 200 | 45 | 23 | 4.5 | -6 | -13 | 0.8 | TN**1604... | 3 |
| A32S-ATFNR/L16-D400 | STEEL | 40 | 32 | 22 | 250 | 50 | 30 | 6 | -6 | -10 | 0.8 | TN**1604... | 3 |

*Torque: Recommended torque (N·m) for clamping
**rε: Standard corner radius

### SPARE PARTS

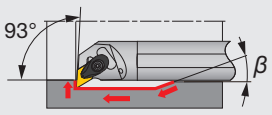
| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|---|---|
| A**-ATFNR/L16-D... | ACP3S | ACS-5W | BP-7 | SP-2.5 | AST322 | CSTB-3.5 | T-15F |

A-ASKNR/L: Inserts → **B070 -**, CBN → **B164 -**, PCD → **B176**

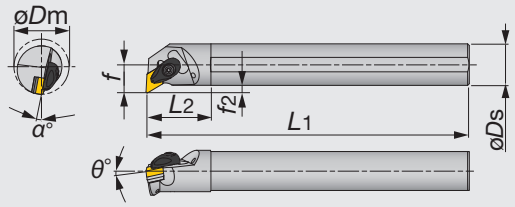
A-ATFNR/L: Inserts → **B079 -**, CBN → **B164 -**, PCD → **B176**

## A-ADUNR/L

Double-clamp boring bar, for negative 55° rhombic inserts




Cutting edge style **U**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | β | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A25R-ADUNR/L15-D320 | STEEL | 32 | 25 | 17 | 200 | 45 | 23 | 4.5 | -6 | -13 | 30 | 0.8 | DN**1504... | 3 |
| A32S-ADUNR/L15-D400 | STEEL | 40 | 32 | 22 | 250 | 50 | 30 | 6 | -6 | -11 | 20 | 0.8 | DN**1504... | 3 |
| A40T-ADUNR15-D500 | STEEL | 50 | 40 | 27 | 300 | 55 | 37 | 7 | -6 | -8 | 15 | 0.8 | DN**1504... | 3 |
| A50U-ADUNR15-D630 | STEEL | 63 | 50 | 35 | 350 | 65 | 47 | 10 | -6 | -7 | 15 | 0.8 | DN**1504... | 3 |
| A25R-ADUNR/L1506-D320 | STEEL | 32 | 25 | 17 | 200 | 45 | 23 | 4.5 | -6 | -13 | 15 | 0.8 | DN**1506... | 3 |
| A32S-ADUNR/L1506-D400 | STEEL | 40 | 32 | 22 | 250 | 50 | 30 | 6 | -6 | -11 | 20 | 0.8 | DN**1506... | 3 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

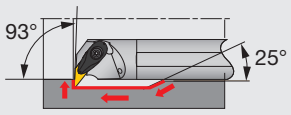
### SPARE PARTS

| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|---|---|
| A**-ADUNR/L15-D... | ACP4S | ACS-5W | BP-7 | SP-2.5 | ASD432 | CSTB-3.5 | T-15F |
| A**-ADUNR/L1506-D... | ACP4S | ACS-5W | BP-7 | SP-2.5 | ASD423 | CSTB-3.5 | T-15F |

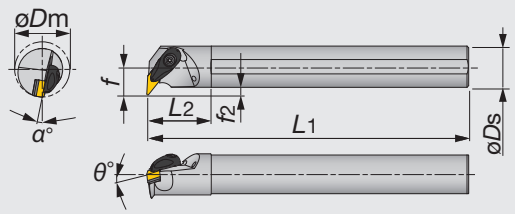


## A-AVUNR/L

Double-clamp boring bar, for negative 35° or 25° rhombic inserts




Cutting edge style **U**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A32S-AVUNR/L16-D400 | STEEL | 40 | 32 | 22 | 250 | 50 | 30 | 6 | -6 | -10 | 0.8 | V/YN**1604... | 3 |
| A40T-AVUNR/L16-D500 | STEEL | 50 | 40 | 27 | 300 | 55 | 37 | 7 | -6 | -8 | 0.8 | V/YN**1604... | 3 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|---|---|
| A**-AVUNR/L16-D... | ACP3L | ACS-5W | BP-7 | SP-2.5 | ASV322 | CSTB-3.5 | T-15F |

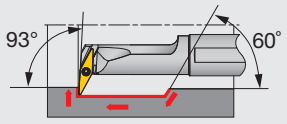
A-ADUNR/L: Inserts → **B061 -**, CBN → **B163 -**, PCD → **B176**

A-AVUNR/L: Inserts → **B097 -**, CBN → **B165 -**, PCD → **B176**

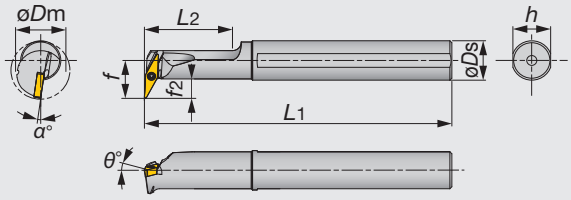
# Y-PRO SERIES

## A/E-SYUBR/L

Screw-on boring bars, for positive 25° rhombic inserts




Cutting edge style **U**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A16Q-SYUBR/L11-D200 | STEEL | 20 | 16 | 15.5 | 180 | 35 | 15 | 8 | 0 | -8 | 0.4 | YW**11T2... | 0.6 |
| E12Q-SYUBR/L11-D200 | CARBIDE | 20 | 12 | 13.5 | 180 | 27 | 11 | 7.5 | 0 | -8 | 0.4 | YW**11T2... | 0.6 |
| E16R-SYUBR/L11-D245 | CARBIDE | 24.5 | 16 | 16 | 200 | 32 | 15 | 8 | 0 | -8 | 0.4 | YW**11T2... | 0.6 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

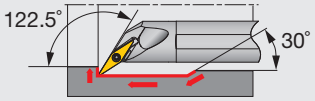
### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| A16Q-SYUBR/L11-D200 | CSTB-2L | T-6F |
| E**-SYUBR/L11-D... | CSTB-2L | T-6F |

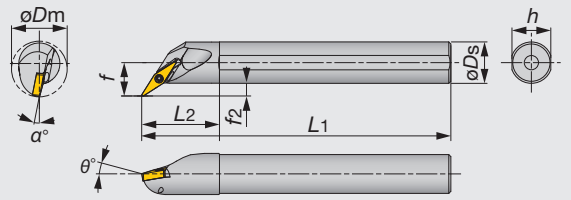
# Y-PRO SERIES

## A/E-SYQBR/L

Screw-on boring bars, for positive 25° rhombic inserts




Cutting edge style **Q**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A12M-SYQBR/L11-D170 | STEEL | 17 | 12 | 10.5 | 150 | 24 | 11 | 4.5 | -5 | -10 | 0.4 | YW**11T2... | 0.6 |
| A16Q-SYQBR/L11-D215 | STEEL | 21.5 | 16 | 13 | 180 | 30 | 15 | 5 | -5 | -8 | 0.4 | YW**11T2... | 0.6 |
| E12Q-SYQBR/L11-D170 | CARBIDE | 17 | 12 | 10.5 | 180 | 27 | 11 | 4.5 | -5 | -10 | 0.4 | YW**11T2... | 0.6 |
| E16R-SYQBR/L11-D215 | CARBIDE | 21.5 | 16 | 13 | 200 | 32 | 15 | 5 | -5 | -8 | 0.4 | YW**11T2... | 0.6 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

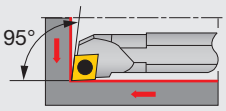
### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| A**-SYQBR/L11-D... | CSTB-2L | T-6F |
| E**-SYQBR/L11-D... | CSTB-2L | T-6F |

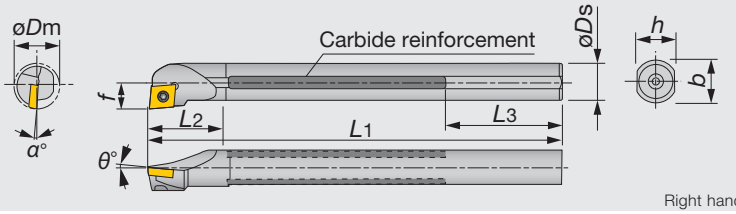
A/E-SYUBR/L, A/E-SYQBR/L: Inserts → **B148**

## T-SCLCR/L

Tsuppari-Ichiban, Screw-on boring bar, for positive 80° rhombic inserts




Cutting edge style **L**




Right hand (R) shown.

| Designation | Material | øDm | Oil hole | øDs | f | L1 | L2 | L3 | h | b | α° | θ° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T12M-SCLCR/L06 | TSUPPARI | 16 | – | 12 | 9 | 150 | 22 | 59 | 11 | – | -10 | 0 | 0.4 | CC**0602... | 1.2 |
| T16Q-SCLCR/L09 | TSUPPARI | 20 | – | 16 | 11 | 180 | 27 | 59 | 15 | – | -10 | 0 | 0.8 | CC**09T3... | 3 |
| T20R-SCLCR/L09C | TSUPPARI | 25 | Rc1/4 | 20 | 13 | 200 | 35 | 49 | 18 | – | -8 | 0 | 0.8 | CC**09T3... | 3 |
| T25S-SCLCR/L09C | TSUPPARI | 32 | Rc1/4 | 25 | 17 | 250 | 40 | 64 | 23 | – | -6 | 0 | 0.8 | CC**09T3... | 3 |

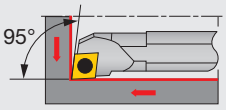
*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: The hole of inserts conforms to ISO standard.
When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (SCLCL** type), and the left hand insert (L) is used for the right hand toolholders (SCLCR** type).

### SPARE PARTS

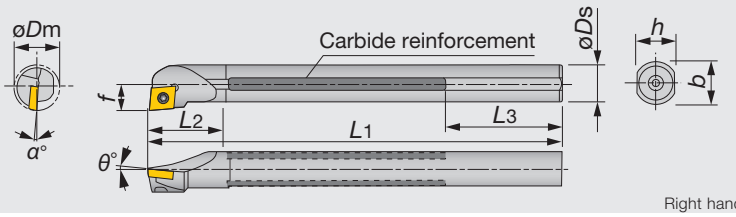
| Designation | Clamping screw | Wrench |
|---|---|---|
| T12M-SCLCR/L06 | CSTB-2.5 | T-8F |
| T16Q-SCLCR/L09 | CSTB-4S | T-15F |
| T20R-SCLCR/L09C | CSTB-4S | T-15F |
| T25S-SCLCR/L09C | CSTB-4S | T-15F |

## T-SCLPR/L

Tsuppari-Ichiban, Screw-on boring bar, for positive 80° rhombic inserts




Cutting edge style **L**




Right hand (R) shown.

| Designation | Material | øDm | Oil hole | øDs | f | L1 | L2 | L3 | h | α° | θ° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T12M-SCLPR08-D14 | TSUPPARI | 14 | - | 12 | 7 | 150 | 22 | 59 | 11 | -4 | 5 | 0.4 | CP**0802... | 1.4 |
| T12M-SCLPR/L08 | TSUPPARI | 16 | - | 12 | 9 | 150 | 25 | 59 | 11 | -3 | 5 | 0.4 | CP**0802... | 1.4 |
| T16Q-SCLPR09-D18 | TSUPPARI | 18 | - | 16 | 9 | 180 | 27 | 59 | 15 | -3.5 | 5 | 0.8 | CP**0903... | 3 |
| T16Q-SCLPR/L09 | TSUPPARI | 20 | - | 16 | 11 | 180 | 30 | 59 | 15 | -4 | 5 | 0.8 | CP**0903... | 3 |
| T20R-SCLPR09C-D22 | TSUPPARI | 22 | Rc1/4 | 20 | 11 | 200 | 35 | 49 | 18 | -2 | 5 | 0.8 | CP**0903... | 3 |
| T20R-SCLPR/L09 | TSUPPARI | 25 | - | 20 | 13 | 200 | 35 | 49 | 18 | -2 | 5 | 0.8 | CP**0903... | 3 |
| T25S-SCLPR09C-D27 | TSUPPARI | 27 | Rc1/4 | 25 | 13.5 | 250 | 40 | 64 | 23 | -1 | 5 | 0.8 | CP**0903... | 3 |
| T25S-SCLPR/L09 | TSUPPARI | 32 | - | 25 | 17 | 250 | 40 | 64 | 23 | 0 | 5 | 0.8 | CP**0903... | 3 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (SCLPL** type), and the left hand insert (L) is used for the right hand toolholders (SCLPR** type).

### SPARE PARTS

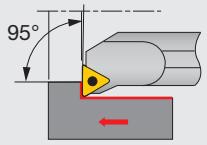
| Designation | Clamping screw | Wrench |
|---|---|---|
| T12M-SCLPR/L08... | CSTB-3L050 | T-9F |
| T16Q-SCLPR09-D18 | CSTB-4L060 | T-15F |
| T16Q-SCLPR/L09 | CSTB-4S | T-15F |
| T20R-SCLPR09C-D22 | CSTB-4L060 | T-15F |
| T20R-SCLPR/L09 | CSTB-4S | T-15F |
| T25S-SCLPR09C-D27 | CSTB-4L060 | T-15F |
| T25S-SCLPR/L09 | CSTB-4S | T-15F |

T-SCLCR/L: Inserts → **B104 -**, CBN → **B168 -**, PCD → **B177**

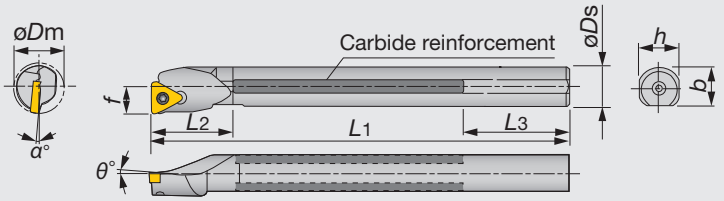
T-SCLPR/L: Inserts → **B111 -**

## T-STUPR/L

Tsuppari-Ichiban boring bar, for positive triangle inserts




Cutting edge style **U**




Right hand (R) shown.

| Designation | Material | øDm | Oil hole | øDs | f | L1 | L2 | L3 | h | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T12M-STUPR11-D14 | TSUPPARI | 14 | - | 12 | 7 | 150 | 24 | 59 | 11 | 5 | -4 | 0.4 | TP**1102... | 1.2 |
| T12M-STUPR/L11 | TSUPPARI | 16 | - | 12 | 9 | 150 | 25 | 58 | 11 | 5 | -4 | 0.4 | TP**1102... | 1.2 |
| T16Q-STUPR13-D18 | TSUPPARI | 18 | - | 16 | 9 | 180 | 30 | 59 | 15 | 5 | -3.5 | 0.4 | TP**1303... | 1.4 |
| T16Q-STUPR/L13 | TSUPPARI | 20 | - | 16 | 11 | 180 | 30 | 59 | 15 | 5 | -3 | 0.4 | TP**1303... | 1.4 |
| T20R-STUPR13C-D22 | TSUPPARI | 22 | Rc1/4 | 20 | 11 | 200 | 35 | 49 | 18 | 5 | -2 | 0.4 | TP**1303... | 1.4 |
| T20R-STUPR/L13 | TSUPPARI | 24 | - | 20 | 13 | 200 | 40 | 49 | 18 | 5 | -2 | 0.4 | TP**1303... | 1.4 |
| T25S-STUPR16C-D27 | TSUPPARI | 27 | Rc1/4 | 25 | 13.5 | 250 | 40 | 64 | 23 | 5 | -1 | 0.8 | TP**16T3... | 3 |
| T25S-STUPR/L16 | TSUPPARI | 31 | - | 25 | 17 | 250 | 45 | 64 | 23 | 5 | 0 | 0.8 | TP**16T3... | 3 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (STUPL** type), and the left hand insert (L) is used for the right hand toolholders (STUPR** type).

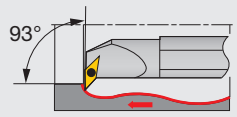
### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| T12M-STUPR11-D14 | CSTB-2.5B | T-8F |
| T12M-STUPR/L11 | CSTB-2.5 | T-8F |
| T16Q-STUPR13-D18 | CSTB-3S | T-9F |
| T16Q-STUPR/L13 | CSTB-3 | T-9F |
| T20R-STUPR13C-D22 | CSTB-3S | T-9F |
| T20R-STUPR/L13 | CSTB-3 | T-9F |
| T25S-STUPR/L16... | CSTB-4S | T-15F |

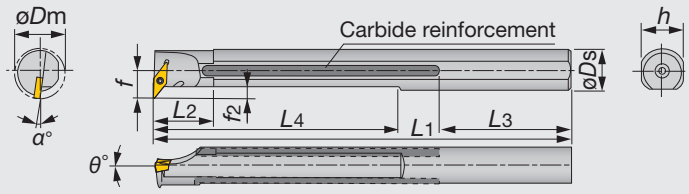
T-STUPR/L: Inserts → **B131 -**, CBN → **B168 -**, PCD → **B178**

## T-SVUBR

Tsuppari-Ichiban, Screw-on boring bar, for positive 35° rhombic inserts




Cutting edge style **U**




Right hand (R) shown.

| Designation | Material | øDm | Oil hole | øDs | f | L1 | L2 | L3 | L4 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T20R-SVUBR11C | TSUPPARI | 25 | Rc1/4 | 20 | 14 | 200 | 30 | 59 | 121 | 18 | 4 | 0 | -8 | 0.4 | VB**1103... | 1.2 |

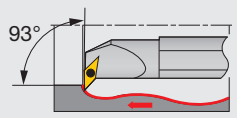
*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (SVUBL** type), and the left hand insert (L) is used for the right hand toolholders (SVUBR** type).

### SPARE PARTS

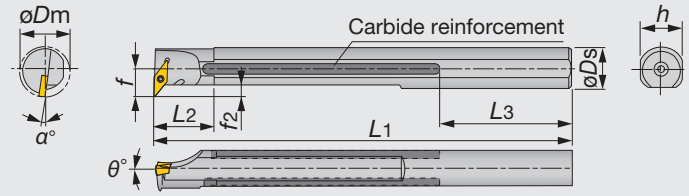
| Designation | Clamping screw | Wrench |
|---|---|---|
| T20R-SVUBR11C | CSTB-2.5 | T-8F |

## T-SVUCR

Tsuppari-Ichiban, Screw-on boring bar, for positive 35° rhombic inserts




Cutting edge style **U**




Right hand (R) shown.

| Designation | Material | øDm | Oil hole | øDs | f | L1 | L2 | L3 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T25S-SVUCR16C | TSUPPARI | 32 | Rc1/4 | 25 | 19 | 250 | 40 | 64 | 23 | 6.5 | 0 | -5 | 0.8 | VC**1604... | 3 |

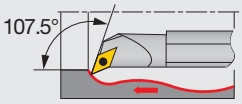
*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: The hole of inserts conforms to ISO standard.
When using a right or left hand insert, the right hand insert (R) is used for left hand toolholders (L) and the left hand insert (L) is used for right hand toolholders (R).

### SPARE PARTS

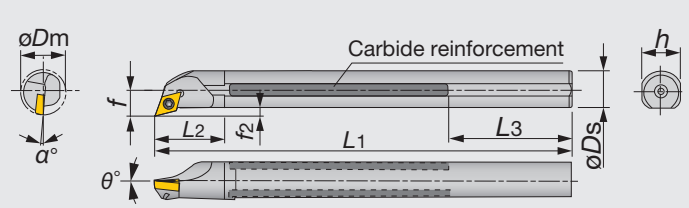
| Designation | Clamping screw | Wrench |
|---|---|---|
| T25S-SVUCR16C | CSTB-3.5L | T-15F |

## T-SDQCR/L

Tsuppari-Ichiban, Screw-on boring bar, for positive 55° rhombic inserts




Cutting edge style **Q**




Right hand (R) shown.

| Designation | Material | øDm | Oil hole | øDs | f | L1 | L2 | L3 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T16Q-SDQCR/L07 | TSUPPARI | 20 | - | 16 | 11 | 180 | 27 | 59 | 15 | 3 | 0 | -6 | 0.4 | DC**0702... | 1.2 |
| T20R-SDQCR/L11C | TSUPPARI | 25 | Rc1/4 | 20 | 13 | 200 | 35 | 49 | 18 | 3 | 0 | -6 | 0.8 | DC**11T3... | 3 |
| T25S-SDQCR/L11C | TSUPPARI | 32 | Rc1/4 | 25 | 17 | 250 | 40 | 64 | 23 | 4.5 | 0 | -4 | 0.8 | DC**11T3... | 3 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: The hole of inserts conforms to ISO standard.
When using a right or left hand insert, the right hand insert (R) is used for left hand toolholders (L) and the left hand insert (L) is used for right hand toolholders (R).

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| T16Q-SDQCR/L07 | CSTB-2.5 | T-8F |
| T20R-SDQCR/L11C | CSTB-4M | T-15F |
| T25S-SDQCR/L11C | CSTB-4 | T-15F |

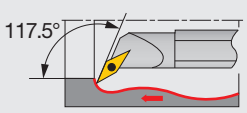

T-SVUBR: Inserts → **B142 -**, CBN → **B169 -**

T-SVUCR: Inserts → **B145 -**, CBN → **B169 -**, PCD → **B177 -**

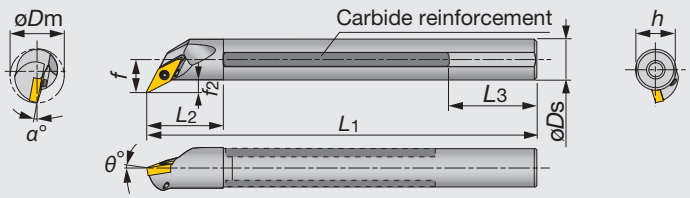
T-SDQCR/L: Inserts → **B114 -**, CBN → **B168 -**, PCD → **B177**

## T-SVQBR

Tsuppari-Ichiban, Screw-on boring bar, for positive 35° rhombic inserts




Cutting edge style **Q**




Right hand (R) shown.

| Designation | Material | øDm | Oil hole | øDs | f | L1 | L2 | L3 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T20R-SVQBR11C | TSUPPARI | 25 | Rc1/4 | 20 | 14 | 200 | 30 | 59 | 18 | 4 | -5 | -7 | 0.4 | VB**1103... | 1.2 |

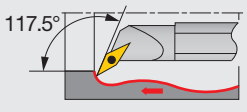
*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: The hole of inserts conforms to ISO standard. When using a right or left hand insert, the right hand instert (R) is used for the left hand toolholders (L), and the left hand insert (L) is used for the right hand toolholders (R).

### SPARE PARTS

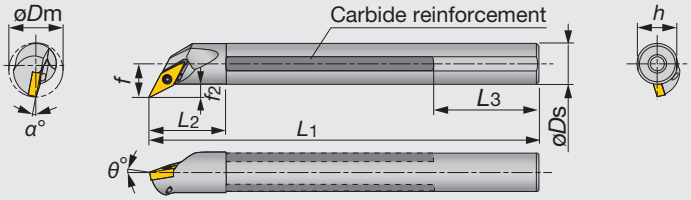
| Designation | Clamping screw | Wrench |
|---|---|---|
| T20R-SVQBR11C | CSTB-2.5 | T-8F |

## T-SVQCR

Tsuppari-Ichiban, Screw-on boring bar, for positive 35° rhombic inserts




Cutting edge style **Q**




Right hand (R) shown.

| Designation | Material | øDm | Oil hole | øDs | f | L1 | L2 | L3 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T25S-SVQCR16C | TSUPPARI | 32 | Rc1/4 | 25 | 17 | 250 | 40 | 64 | 23 | 8 | 0 | -5 | 0.8 | VC**1604... | 3 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: The hole of inserts conforms to ISO standard. When using a right or left hand insert, the right hand instert (R) is used for the left hand toolholders (L), and the left hand insert (L) is used for the right hand toolholders (R).

### SPARE PARTS

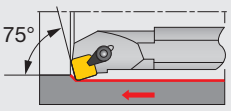
| Designation | Clamping screw | Wrench |
|---|---|---|
| T25S-SVQCR16C | CSTB-3.5L | T-15F |

T-SVQBR: Inserts → **B142 -**, CBN → **B169 -**

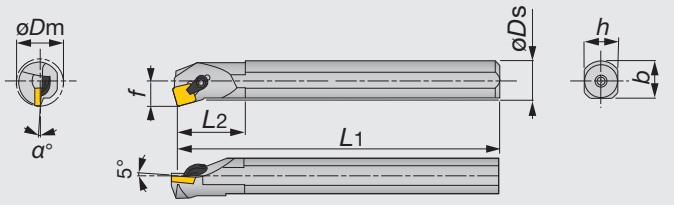
T-SVQCR: Inserts → **B145 -**, CBN → **B169 -**, PCD → **B177 -**

## S-CSKPR/L

Clamp-on boring bar, for positive square inserts




Cutting edge style **K**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | b | α° | rε** | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| S16Q-CSKPR09 | STEEL | 20 | 16 | 11 | 180 | 30 | 15 | 15 | -4 | 0.8 | SP**0903... |
| S20R-CSKPR/L09 | STEEL | 25 | 20 | 13 | 200 | 40 | 18 | 18.5 | -2 | 0.8 | SP**0903... |
| S25S-CSKPR12 | STEEL | 32 | 25 | 17 | 250 | 45 | 23 | 22.5 | 0 | 0.8 | SP**1203... |

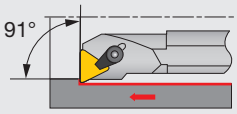
**rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert (R) is used for left hand toolholders (L) and the left hand insert (L) is used for right hand toolholders (R).

### SPARE PARTS

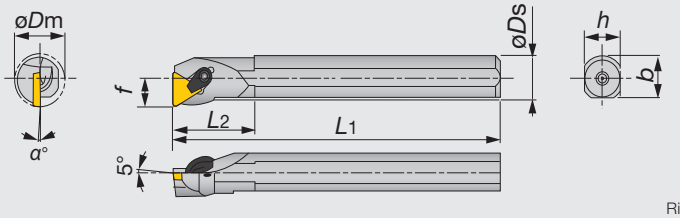
| Designation | Clamp set | Wrench |
|---|---|---|
| S16Q-CSKPR09 | CSG-5S | P-2.5 |
| S20R-CSKPR/L09 | CSG-5 | P-2.5 |
| S25S-CSKPR12 | CSG-6 | P-3 |

## S/C-CTFPR/L

Clamp-on style boring bar, for positive triangle inserts




Cutting edge style **F**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | b | α° | rε** | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| S12M-CTFPR/L11 | STEEL | 16 | 12 | 9 | 150 | 25 | 11 | 11.5 | -6 | 0.4 | TP**1103... |
| S16Q-CTFPR/L11 | STEEL | 20 | 16 | 11 | 180 | 30 | 15 | 15 | -4 | 0.4 | TP**1103... |
| S20R-CTFPR/L16 | STEEL | 25 | 20 | 13 | 200 | 40 | 18 | 18.5 | -2 | 0.8 | TP**1603... |
| S25S-CTFPR/L16 | STEEL | 32 | 25 | 17 | 250 | 45 | 23 | 22.5 | 0 | 0.8 | TP**1603... |
| S32T-CTFPR/L16 | STEEL | 40 | 32 | 22 | 300 | 50 | 30 | 29.5 | 0 | 0.8 | TP**1603... |
| C12Q-CTFPR/L11 | CARBIDE | 16 | 12 | 9 | 180 | - | 11 | - | -6 | 0.4 | TP**1103... |
| C16R-CTFPR/L11 | CARBIDE | 20 | 16 | 11 | 200 | - | 15 | - | -4 | 0.4 | TP**1103... |

**rε: Standard corner radius
Note: The hole of inserts conforms to ISO standard.
When using a right or left hand insert, the right hand insert (R) is used for left hand toolholders (L) and the left hand insert (L) is used for right hand toolholders (R).

### SPARE PARTS

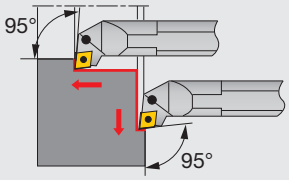
| Designation | Clamp set | Wrench |
|---|---|---|
| S12M-CTFPR/L11 | CSW-00 | P-2.5 |
| S16Q-CTFPR/L11 | CSG-5S | P-2.5 |
| S20R-CTFPR/L16 | CSG-6S | P-3 |
| S**-CTFPR/L16 | CSG-6 | P-3 |
| C12Q-CTFPR/L11 | CSW-00 | P-2.5 |
| C16R-CTFPR/L11 | CSG-5S | P-2.5 |

S/C-CSKPR/L: Inserts → **B125**, CBN → **B168**, PCD → **B177**

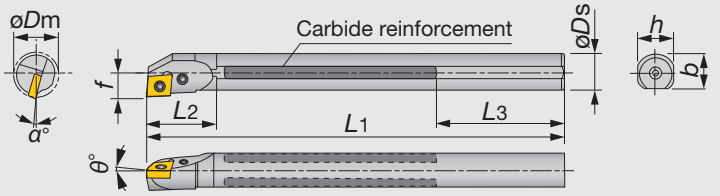
S/C-CTFPR/L: Inserts → **B139 -**, CBN → **B168 -**, PCD → **B178**

## T-PCLNR

Lever-lock boring bar, for negative 80° rhombic inserts




Cutting edge style **L**




Right hand (R) shown.

| Designation | Material | øDm | Oil hole | øDs | f | L1 | L2 | L3 | h | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T16Q-PCLNR09 | TSUPPARI | 20 | - | 16 | 11 | 180 | 27 | 59 | 15 | -6 | -14 | 0.8 | CN**0903... | 1.7 |
| T20R-PCLNR09C | TSUPPARI | 25 | Rc1/4 | 20 | 13 | 200 | 35 | 49 | 18 | -6 | -12 | 0.8 | CN**0903... | 1.7 |
| T25S-PCLNR09C | TSUPPARI | 32 | Rc1/4 | 25 | 17 | 250 | 40 | 64 | 23 | -6 | -11 | 0.8 | CN**0903... | 1.7 |
| T32U-PCLNR12C | TSUPPARI | 40 | Rc1/2 | 32 | 22 | 350 | 50 | 103 | 30 | -6 | -11 | 0.8 | CN**1204... | 4.8 |
| T40V-PCLNR12C | TSUPPARI | 50 | Rc1/2 | 40 | 27 | 400 | 55 | 88 | 37 | -6 | -10 | 0.8 | CN**1204... | 4.8 |
| T50W-PCLNR12C | TSUPPARI | 63 | Rc1/2 | 50 | 35 | 450 | 65 | 63 | 47 | -6 | -8 | 0.8 | CN**1204... | 4.8 |

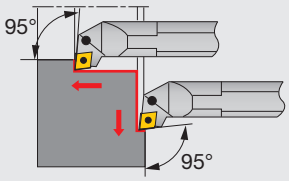
*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert is used for left hand toolholders and the left hand insert is used for right hand toolholders.

### SPARE PARTS

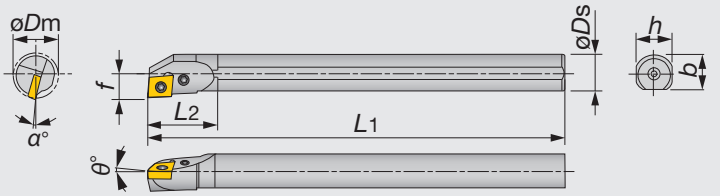
| Designation | Shim | Clamping screw 1 | Clamping screw 2 | Wrench 1 | Wrench 2 | Spring | Lever |
|---|---|---|---|---|---|---|---|
| T**-PCLNR09... | - | LCS22A | - | P-2F | - | - | LCL32N |
| T**-PCLNR12C | LSC42BR | - | LCS4 | - | P-3 | LSP4 | LCL4 |

## S-PCLNR/L

Lever-lock boring bar, for negative 80° rhombic inserts




Cutting edge style **L**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | b | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S16M-PCLNR/L09 | STEEL | 20 | 16 | 11 | 150 | 30 | 15 | 15.5 | -6 | -14 | 0.8 | CN**0903... | 1.7 |
| S20Q-PCLNR/L09 | STEEL | 25 | 20 | 13 | 180 | 35 | 18 | 19 | -6 | -12 | 0.8 | CN**0903... | 1.7 |
| S25R-PCLNR/L09 | STEEL | 32 | 25 | 17 | 200 | 40 | 23 | 24 | -6 | -11 | 0.8 | CN**0903... | 1.7 |
| S32S-PCLNR/L12 | STEEL | 40 | 32 | 22 | 250 | 50 | 30 | 29.5 | -6 | -11 | 0.8 | CN**1204... | 4.8 |
| S40T-PCLNR/L12 | STEEL | 50 | 40 | 27 | 300 | 55 | 37 | 37.5 | -6 | -10 | 0.8 | CN**1204... | 4.8 |
| S50U-PCLNR/L12 | STEEL | 63 | 50 | 35 | 350 | 65 | 47 | 47.5 | -6 | -8 | 0.8 | CN**1204... | 4.8 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert is used for left hand toolholders and the left hand insert is used for right hand toolholders.

### SPARE PARTS

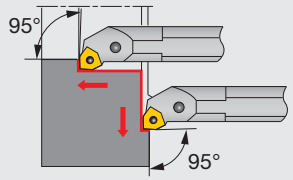
| Designation | Shim | Clamping screw 1 | Clamping screw 2 | Wrench 1 | Wrench 2 | Spring | Lever |
|---|---|---|---|---|---|---|---|
| S**-PCLNR/L09 | - | LCS22A | - | P-2F | - | - | LCL32N |
| S32S-PCLNR/L12 | LSC42BR/L | - | LCS4 | - | P-3 | LSP4 | LCL4 |
| S40T-PCLNR/L12 | LSC42BR/L | - | LCS4 | - | P-3 | LSP4 | LCL4 |
| S50U-PCLNR/L12 | LSC42BR/L | - | LCS4 | - | P-3 | LSP4 | LCL4 |

T-SVQBR: Inserts → **B142 -**, CBN → **B169 -**

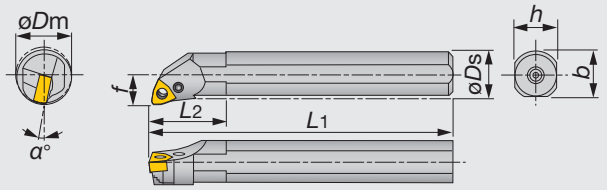
T-SVQCR/L: Inserts → **B145 -**, CBN → **B169 -**, PCD → **B177 -**

## S-PWLNR/L

Lever-lock boring bar, for negative trigon inserts




Cutting edge style **L**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | b | α° | rε** | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| S16M-PWLNR/L06 | STEEL | 20 | 16 | 11 | 150 | 30 | 15 | 15.5 | -17 | 0.8 | WN**0604... |
| S20Q-PWLNR/L06 | STEEL | 25 | 20 | 13 | 180 | 35 | 18 | 19 | -14 | 0.8 | WN**0604... |
| S25R-PWLNR/L06 | STEEL | 32 | 25 | 17 | 200 | 40 | 23 | 24 | -12 | 0.8 | WN**0604... |

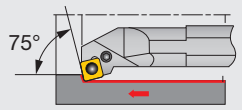
**rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert is used for left hand toolholders and the left hand insert is used for right hand toolholders.

### SPARE PARTS

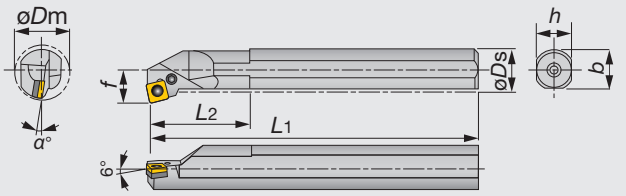
| Designation | Shim | Clamping screw 1 | Clamping screw 2 | Wrench 1 | Wrench 2 | Spring | Lever |
|---|---|---|---|---|---|---|---|
| S**-PWLNR/L06 | - | LCS33 | - | P-2F | - | - | LCL33N |
| S25R-PWLNR06 | LSW312BR | - | LCS3B | - | P-2.5 | LSP3 | LCL3 |
| S25R-PWLNL06 | LSW312BL | - | LCS3B | - | P-2.5 | LSP3 | LCL3 |

## S-PSKNR

Lever-lock boring bar, for negative square inserts




Cutting edge style **K**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | b | α° | rε** | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| S32S-PSKNR12 | STEEL | 40 | 32 | 22 | 250 | 50 | 30 | 29.5 | -10 | 0.8 | SN**1204... |
| S40T-PSKNR12 | STEEL | 50 | 40 | 27 | 300 | 55 | 37 | 37.5 | -10 | 0.8 | SN**1204... |
| S50U-PSKNR12 | STEEL | 63 | 50 | 35 | 350 | 65 | 47 | 47.5 | -8 | 0.8 | SN**1204... |

**rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert is used for left hand toolholders and the left hand insert is used for right hand toolholders.

### SPARE PARTS

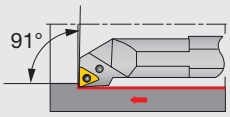
| Designation | Shim | Clamping screw | Wrench | Spring | Lever |
|---|---|---|---|---|---|
| S**-PSKNR12 | LSS42BR | LCS4 | P-3 | LSP4 | LCL4 |

S-PWLNR/L: Inserts → **B090 -**, CBN → **B165**

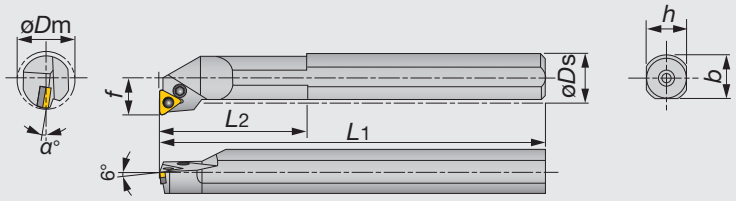
S-PSKNR: Inserts → **B070 -**, CBN → **B164 -**, PCD → **B176**

## S-PTFNR/L

Lever lock type boring bar, for negative triangle inserts




Cutting edge style **F**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | b | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S32S-PTFNR/L16 | STEEL | 40 | 32 | 22 | 250 | 50 | 30 | 29.5 | -10 | 0.8 | TN**1604... | 2.7 |
| S40T-PTFNR/L16 | STEEL | 50 | 40 | 27 | 300 | 55 | 37 | 37.5 | -10 | 0.8 | TN**1604... | 2.7 |
| S50U-PTFNR16 | STEEL | 63 | 50 | 35 | 350 | 65 | 47 | 47.5 | -8 | 0.8 | TN**1604... | 2.7 |

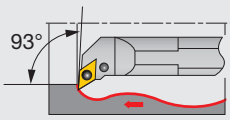
*Torque: Recommended torque (N·m) for clamping **$r_\varepsilon$: Standard corner radius
Note: When using a right or left hand insert, the right hand insert is used for left hand toolholders and the left hand insert is used for right hand toolholders.

### SPARE PARTS

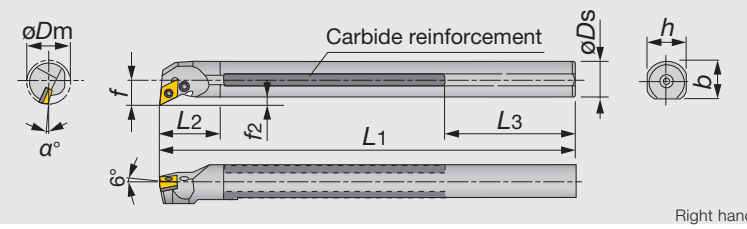
| Designation | Shim | Clamping screw | Wrench | Spring | Lever |
|---|---|---|---|---|---|
| S32S-PTFNR16 | LST317BR | LCS3 | P-2.5 | LSP3 | LCL3 |
| S32S-PTFNL16 | LST317BL | LCS3 | P-2.5 | LSP3 | LCL3 |
| S40T-PTFNR16 | LST317BR | LCS3 | P-2.5 | LSP3 | LCL3 |
| S40T-PTFNL16 | LST317BL | LCS3 | P-2.5 | LSP3 | LCL3 |
| S50U-PTFNR16 | LST317BR | LCS3 | P-2.5 | LSP3 | LCL3 |

## T-PDUNR

Lever-lock boring bar, for negative 55° rhombic inserts




Cutting edge style **U**




Right hand (R) shown.

| Designation | Material | øDm | Oil hole | øDs | f | L1 | L2 | L3 | h | f2 | α° | rε** | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T32U-PDUNR15C | TSUPPARI | 40 | Rc1/2 | 32 | 22 | 350 | 50 | 103 | 30 | 6 | -13 | 0.8 | DN**1504... |
| T40V-PDUNR15C | TSUPPARI | 50 | Rc1/2 | 40 | 27 | 400 | 55 | 88 | 37 | 7 | -10 | 0.8 | DN**1504... |
| T50W-PDUNR15C | TSUPPARI | 63 | Rc1/2 | 50 | 35 | 450 | 65 | 63 | 47 | 10 | -8 | 0.8 | DN**1504... |

**$r_\varepsilon$: Standard corner radius
Note: When using a right or left hand insert, the right hand insert is used for left hand toolholders and the left hand insert is used for right hand toolholders.

### SPARE PARTS

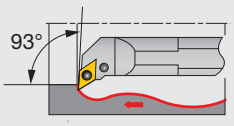
| Designation | Shim | Clamping screw | Wrench | Spring | Lever |
|---|---|---|---|---|---|
| T**-PDUNR15C | LSD42BR | LCS4 | P-3 | LSP4 | LCL4 |

S-PTFNR/L: Inserts → **B079 -**, CBN → **B164 -**, PCD → **B176**

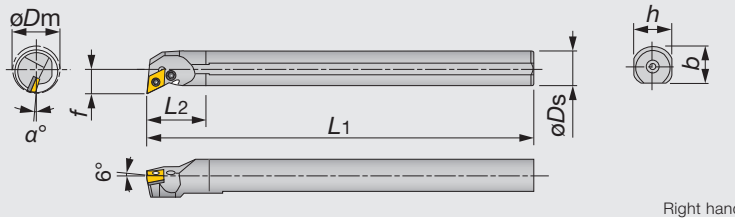
T-PDUNR: Inserts → **B061 -**, CBN → **B163 -**, PCD → **B176**

## S-PDUNR/L

Lever-lock boring bar, for negative 55° rhombic inserts




Cutting edge style **U**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | b | α° | rε** | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| S20Q-PDUNR/L11 | STEEL | 25 | 20 | 13 | 180 | 35 | 18 | 19 | -14 | 0.8 | DN**1104... |
| S25R-PDUNR/L11 | STEEL | 32 | 25 | 17 | 200 | 40 | 23 | 24 | -12 | 0.8 | DN**1104... |
| S32S-PDUNR/L15 | STEEL | 40 | 32 | 22 | 250 | 50 | 30 | 29.5 | -13 | 0.8 | DN**1504... |
| S40T-PDUNR/L15 | STEEL | 50 | 40 | 27 | 300 | 55 | 37 | 37.5 | -10 | 0.8 | DN**1504... |
| S50U-PDUNR/L15 | STEEL | 63 | 50 | 35 | 350 | 65 | 47 | 47.5 | -8 | 0.8 | DN**1504... |

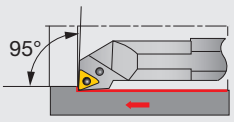
**rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert is used for left hand toolholders and the left hand insert is used for right hand toolholders.

### SPARE PARTS

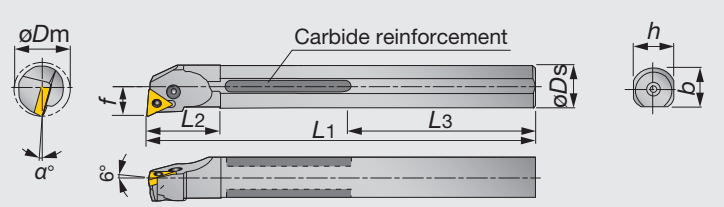
| Designation | Shim | Clamping screw 1 | Clamping screw 2 | Wrench 1 | Wrench 2 | Spring | Lever |
|---|---|---|---|---|---|---|---|
| S20Q-PDUNR/L11 | - | LCS22A | - | P-2F | - | - | LCL33NL |
| S25R-PDUNR11 | ELSD317BR | - | LCS3 | - | P-2.5 | LSP3 | LCL33L |
| S25R-PDUNL11 | ELSD317BL | - | LCS3 | - | P-2.5 | LSP3 | LCL33L |
| S32S-PDUNR15 | LSD42BR | - | LCS4 | - | P-3 | LSP4 | LCL4 |
| S32S-PDUNL15 | LSD42BL | - | LCS4 | - | P-3 | LSP4 | LCL4 |
| S40T-PDUNR15 | LSD42BR | - | LCS4 | - | P-3 | LSP4 | LCL4 |
| S40T-PDUNL15 | LSD42BL | - | LCS4 | - | P-3 | LSP4 | LCL4 |
| S50U-PDUNR15 | LSD42BR | - | LCS4 | - | P-3 | LSP4 | LCL4 |
| S50U-PDUNL15 | LSD42BL | - | LCS4 | - | P-3 | LSP4 | LCL4 |

## T-PTUNR

Lever-lock boring bar, for negative triangle inserts




Cutting edge style **U**




Right hand (R) shown.

| Designation | Material | øDm | Oil hole | øDs | f | L1 | L2 | L3 | h | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T16Q-PTUNR11 | TSUPPARI | 20 | - | 16 | 11 | 180 | 27 | 59 | 15 | -14 | 0.4 | TN**1103... | 1.7 |
| T20R-PTUNR11C | TSUPPARI | 25 | Rc1/4 | 20 | 13 | 200 | 35 | 49 | 18 | -12 | 0.4 | TN**1103... | 1.7 |
| T25S-PTUNR16C | TSUPPARI | 32 | Rc1/4 | 25 | 17 | 250 | 40 | 64 | 23 | -12 | 0.8 | TN**1604... | 2.7 |
| T32U-PTUNR16C | TSUPPARI | 40 | Rc1/2 | 32 | 22 | 350 | 50 | 103 | 30 | -10 | 0.8 | TN**1604... | 2.7 |
| T40V-PTUNR16C | TSUPPARI | 50 | Rc1/2 | 40 | 27 | 400 | 55 | 88 | 37 | -10 | 0.8 | TN**1604... | 2.7 |
| T50W-PTUNR16C | TSUPPARI | 63 | Rc1/2 | 50 | 35 | 450 | 65 | 63 | 47 | -8 | 0.8 | TN**1604... | 2.7 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: • The hole of inserts conforms to ISO standard.
• Toolholder lengths do not always conform to ISO.
• When using a right or left hand insert, the right hand insert is used for left hand toolholders and the left hand insert is used for right hand toolholders.

### SPARE PARTS

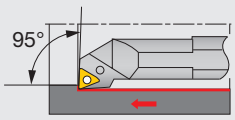
| Designation | Shim | Clamping screw 1 | Clamping screw 2 | Wrench 1 | Wrench 2 | Spring | Lever |
|---|---|---|---|---|---|---|---|
| T**-PTUNR11... | - | LCS22A | - | P-2F | - | - | LCL22N |
| T25S-PTUNR16C | ELST317BR | - | LCS3 | - | P-2.5 | LSP3 | LCL33 |
| T**-PTUNR16C | LST317BR | - | LCS3 | - | P-2.5 | LSP3 | LCL3 |

S-PDUNR/L: Inserts → **B061 -**, CBN → **B163 -**, PCD → **B176**

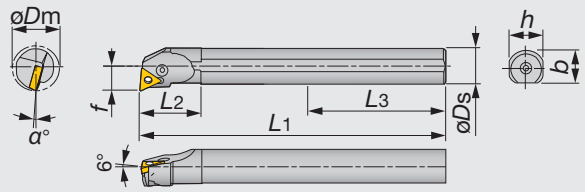
T-PTUNR: Inserts → **B079 -**, CBN → **B164 -**, PCD → **B176**

## A/S-PTUNR/L

Lever lock type boring bar, for negative triangle inserts




Cutting edge style **U**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | b | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S16M-PTUNR/L11 | STEEL | 20 | 16 | 11 | 150 | 30 | 15 | 15.5 | -14 | 0.4 | TN**1103... | 1.7 |
| S20Q-PTUNR/L11 | STEEL | 25 | 20 | 13 | 180 | 35 | 18 | 19 | -12 | 0.4 | TN**1103... | 1.7 |
| S25R-PTUNR/L16 | STEEL | 32 | 25 | 17 | 200 | 40 | 23 | 24 | -12 | 0.8 | TN**1604... | 2.7 |
| A32S-PTUNR/L16 | STEEL | 40 | 32 | 22 | 250 | 50 | 30 | 29.5 | -12 | 0.8 | TN**1604... | 2.7 |

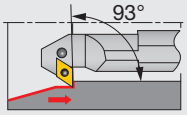
*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: • The hole of inserts conforms to ISO standard.
• Toolholder lengths do not always conform to ISO.
• When using a right or left hand insert, the right hand insert is used for left hand toolholders and the left hand insert is used for right hand toolholders.

### SPARE PARTS

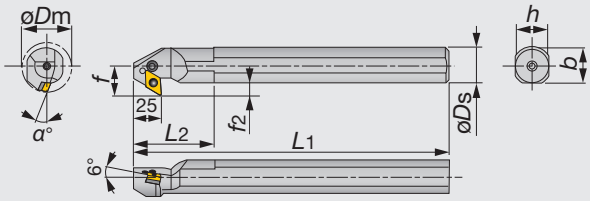
| Designation | Shim | Clamping screw 1 | Clamping screw 2 | Wrench 1 | Wrench 2 | Spring | Lever | Oil supply attachment |
|---|---|---|---|---|---|---|---|---|
| S**-PTUNR/L11 | - | LCS22A | - | P-2F | - | - | LCL22N | - |
| S25R-PTUNR16 | ELST317BR | - | LCS3 | - | P-2.5 | LSP3 | LCL33 | - |
| S25R-PTUNL16 | ELST317BL | - | LCS3 | - | P-2.5 | LSP3 | LCL33 | - |
| A32S-PTUNR16 | LST317BR | - | LCS3 | - | P-2.5 | LSP3 | LCL3 | EA-32 |
| A32S-PTUNL16 | LST317BL | - | LCS3 | - | P-2.5 | LSP3 | LCL3 | EA-32 |

## S-PDZNR/L

Lever-lock boring bar, for negative 55° rhombic inserts




Cutting edge style **Z**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | b | α° | rε** | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S32S-PDZNR/L15 | STEEL | 40 | 32 | 22 | 275 | 55 | 30 | 6 | 29.5 | -13 | 0.8 | DN**1504... |
| S40T-PDZNR15 | STEEL | 50 | 40 | 27 | 325 | 60 | 37 | 7 | 37.5 | -10 | 0.8 | DN**1504... |
| S50U-PDZNR15 | STEEL | 60 | 50 | 35 | 375 | 65 | 47 | 10 | 47.5 | -8 | 0.8 | DN**1504... |

**rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert is used for right hand toolholders and the left hand insert is used for left hand toolholders.

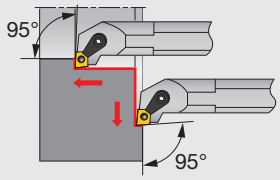
### SPARE PARTS

| Designation | Shim | Clamping screw | Wrench | Spring | Lever |
|---|---|---|---|---|---|
| S32S-PDZNR15 | LSZ42BR | LCS4 | P-3 | LSP4 | LCL4 |
| S32S-PDZNL15 | LSZ42BL | LCS4 | P-3 | LSP4 | LCL4 |
| S*0*-PDZNR15 | LSZ42BR | LCS4 | P-3 | LSP4 | LCL4 |

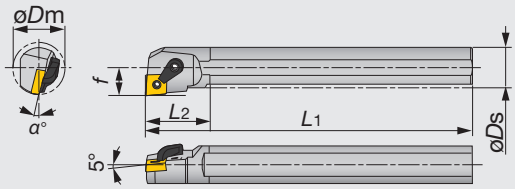
S-PTUNR/L: Inserts → **B079 -**, CBN → **B164 -**, PCD → **B176**
S-PDZNR/L: Inserts → **B061 -**, CBN → **B163 -**, PCD → **B176**

## S-MCLNR/L

Multi-clamp boring bar, for negative 80° rhombic inserts




Cutting edge style **L**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | b | α° | rε** | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| S25R-MCLNR/L12 | STEEL | 32 | 25 | 17 | 200 | 40 | 23 | 22.5 | -12 | 0.8 | CN**1204... |

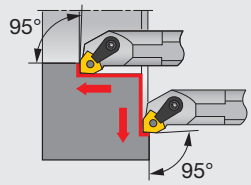
**rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (MCLNL** type), and the left hand insert (L) is used for the right hand toolholders (MCLNR** type).

### SPARE PARTS

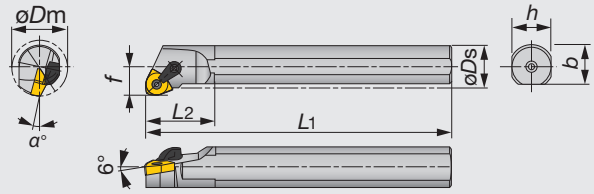
| Designation | Clamp | Pin | Clamping screw | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|
| S25R-MCLNR/L12 | MCPM-21 | MLP44 | MCS620-3 | P-3 | P-2.5F |

## S-MWLNR/L

Multi-clamp boring bar, for negative trigon inserts




Cutting edge style **L**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | b | α° | rε** | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| S25R-MWLNR/L08 | STEEL | 32 | 25 | 17 | 200 | 40 | 23 | 22.5 | -12 | 0.8 | WN**0804... |
| S32S-MWLNR/L08 | STEEL | 44 | 32 | 22 | 250 | 50 | 30 | 29.5 | -10 | 0.8 | WN**0804... |
| S40T-MWLNR/L08 | STEEL | 54 | 40 | 27 | 300 | 60 | 37 | 37.5 | -10 | 0.8 | WN**0804... |
| S50U-MWLNR/L08 | STEEL | 70 | 50 | 35 | 350 | 75 | 47 | 47.5 | -10 | 0.8 | WN**0804... |

**rε: Standard corner radius

### SPARE PARTS

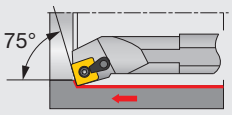
| Designation | Clamp | Pin | Clamping screw | Shim | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|
| S25R-MWLNR/L08 | MCPM-6 | MLP44 | MCS520-2.5 | - | P-2.5 | P-2.5F |
| S32S-MWLNR/L08 | MCPM-6 | MLP46 | MCS520-2.5 | MSW-432BR/L | P-2.5 | P-2.5F |
| S40T-MWLNR/L08 | MCPM-6 | MLP46 | MCS520-2.5 | MSW-432BR/L | P-2.5 | P-2.5F |
| S50U-MWLNR/L08 | MCPM-6 | MLP46 | MCS520-2.5 | MSW-432BR/L | P-2.5 | P-2.5F |

S-MCLNR/L: Inserts → **B050 -**, CBN → **B163 -**, PCD → **B176**

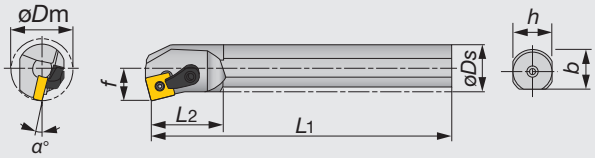
S-MWLNR/L: Inserts → **B090 -**, CBN → **B165**

## S-MSKNR/L

Multi-clamp boring bar, for negative square inserts




Cutting edge style **K**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | b | α° | rε** | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| S25R-MSKNR/L12 | STEEL | 32 | 25 | 17 | 200 | 40 | 23 | 22.5 | -12 | 0.8 | SN**1204... |

**rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (MSKNL** type), and the left hand insert (L) is used for the right hand toolholders (MSKNR** type).

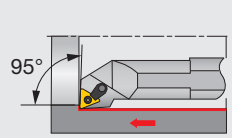
### SPARE PARTS

| Designation | Clamp | Pin | Clamping screw | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|
| S25R-MSKNR/L12 | MCPM-21<br>MCL-6* | MLP44 | MCS620-3 | P-3 | P-2.5F |

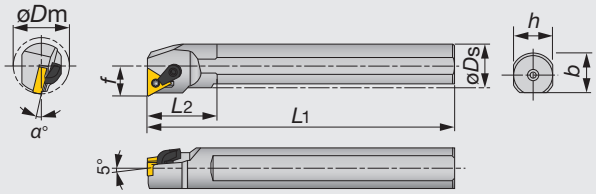
Note: * marked parts type No. in former type No.

## S-MTFNR/L

Multi-clamp boring bar, for negative triangle inserts




Cutting edge style **F**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | b | α° | rε** | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| S25R-MTFNR/L16 | STEEL | 32 | 25 | 17 | 200 | 40 | 23 | 22.5 | -12 | 0.8 | TN**1604... |

**rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (MTFNL** type), and the left hand insert (L) is used for the right hand toolholders (MTFNR** type).

### SPARE PARTS

| Designation | Clamp | Pin | Clamping screw | Wrench1 | Wrench 2 |
|---|---|---|---|---|---|
| S25R-MTFNR/L16 | MCPM-6<br>MCL-5M* | MLP33L | MCS520-2.5 | P-2.5 | P-2F |

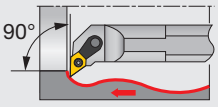
Note: * marked parts type No. in former type No.

S-MSKNR/L: Inserts → **B070 -**, CBN → **B164 -**, PCD → **B176**

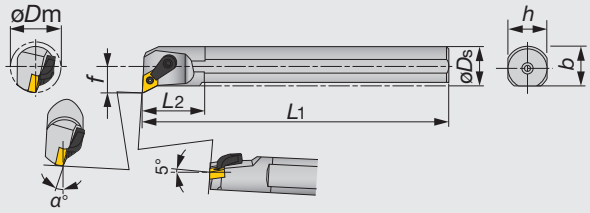
S-MTFNR/L: Inserts → **B079 -**, CBN → **B164 -**, PCD → **B176**

## S-MDUNR/L

Multi-clamp boring bar, for negative 55° rhombic inserts




Cutting edge style **U**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | b | α° | rε** | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| S25R-MDUNR/L11 | STEEL | 32 | 25 | 17 | 200 | 40 | 23 | 22.5 | -12 | 0.8 | DN**1104... |

**rε: Standard corner radius

Note: When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (MDUNL** type), and the left hand insert (L) is used for the right hand toolholders (MDUNR** type).

### SPARE PARTS

| Designation | Clamp | Pin | Clamping screw | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|
| S25R-MDUNR/L11 | MCPM-21<br>MCL-6* | MLP33L | MCS620-3 | P-3 | P-2F |

Note: * marked parts type No. in former type No.

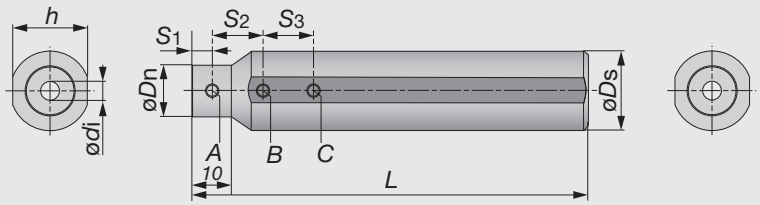


S-MDUNR/L: Inserts → **B061 -**, CBN → **B163 -**, PCD → **B176**

## BLM sleeves

Standard Sleeves for SJB-Mini series with round shank






| Designation | øDs | ødi | øDn | L | h | S1 | S2 | S3 |
|---|---|---|---|---|---|---|---|---|
| BLM159-04 | 15.875 | 4 | 15 | 100 | 15 | 5 | 15 | 15 |
| BLM159-05 | 15.875 | 5 | 15 | 100 | 15 | 5 | 15 | 15 |
| BLM159-06 | 15.875 | 6 | 15 | 100 | 15 | 5 | 20 | 20 |
| BLM159-07 | 15.875 | 7 | 15 | 100 | 15 | 5 | 20 | 20 |
| BLM16-04 | 16 | 4 | 15 | 100 | 15 | 5 | 15 | 15 |
| BLM16-05 | 16 | 5 | 15 | 100 | 15 | 5 | 15 | 15 |
| BLM16-06 | 16 | 6 | 15 | 100 | 15 | 5 | 20 | 20 |
| BLM16-07 | 16 | 7 | 15 | 100 | 15 | 5 | 20 | 20 |
| BLM19-04 | 19.05 | 4 | 18 | 100 | 18 | 5 | 15 | 15 |
| BLM19-05 | 19.05 | 5 | 18 | 100 | 18 | 5 | 15 | 15 |
| BLM19-06 | 19.05 | 6 | 18 | 100 | 18 | 5 | 20 | 20 |
| BLM19-07 | 19.05 | 7 | 18 | 100 | 18 | 5 | 20 | 20 |
| BLM20-04 | 20 | 4 | 13 | 100 | 19 | 5 | 15 | 15 |
| BLM20-05 | 20 | 5 | 14 | 100 | 19 | 5 | 15 | 15 |
| BLM20-06 | 20 | 6 | 15 | 100 | 19 | 5 | 20 | 20 |
| BLM20-07 | 20 | 7 | 16 | 100 | 19 | 5 | 20 | 20 |
| BLM22-04 | 22 | 4 | 13 | 125 | 21 | 5 | 15 | 15 |
| BLM22-05 | 22 | 5 | 14 | 125 | 21 | 5 | 15 | 15 |
| BLM22-06 | 22 | 6 | 15 | 125 | 21 | 5 | 20 | 20 |
| BLM22-07 | 22 | 7 | 16 | 125 | 21 | 5 | 20 | 20 |
| BLM25-04 | 25 | 4 | 13 | 125 | 24 | 5 | 15 | 15 |
| BLM25-05 | 25 | 5 | 14 | 125 | 24 | 5 | 15 | 15 |
| BLM25-06 | 25 | 6 | 15 | 125 | 24 | 5 | 20 | 20 |
| BLM25-07 | 25 | 7 | 16 | 125 | 24 | 5 | 20 | 20 |
| BLM254-04 | 25.4 | 4 | 13 | 125 | 24 | 5 | 15 | 15 |
| BLM254-05 | 25.4 | 5 | 14 | 125 | 24 | 5 | 15 | 15 |
| BLM254-06 | 25.4 | 6 | 15 | 125 | 24 | 5 | 20 | 20 |
| BLM254-07 | 25.4 | 7 | 16 | 125 | 24 | 5 | 20 | 20 |

### SPARE PARTS



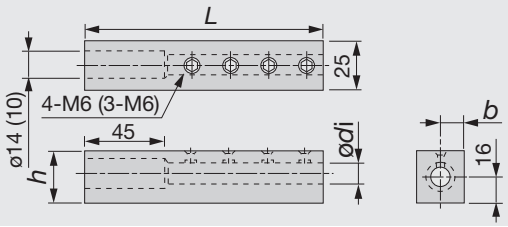



| Designation | Clamping screw *A* | Clamping screw *B*, *C* | Wrench | Seal cap*(inner screw) |
|---|---|---|---|---|
| BLM159, 16... | SSHM4-4 | SSHM4-4 | P-2 | CA-16(M6) |
| BLM19-04 | SSHM4-4 | SSHM4-6 | P-2 | CA-16(M6) |
| BLM19-05, 06, 07 | SSHM4-4 | SSHM4-4 | P-2 | CA-16(M6) |
| BLM20-04, 05 | SSHM4-4 | SSHM4-6 | P-2 | CA-16(M6) |
| BLM20-06, 07 | SSHM4-4 | SSHM4-4 | P-2 | CA-16(M6) |
| BLM22-... | SSHM4-4 | SSHM4-6 | P-2 | CA-16(M6) |
| BLM25-04, 05 | SSHM4-4 | SSHM4-8 | P-2 | CA-16(M6) |
| BLM25-06 | SSHM4-4 | SSHM4-8 | P-2 | CA-16(M6) |
| BLM25-07 | SSHM4-4 | SSHM4-6 | P-2 | CA-16(M6) |
| BLM254-04, 05, 06 | SSHM4-4 | SSHM4-8 | P-2 | CA-16(M6) |
| BLM254-07 | SSHM4-4 | SSHM4-6 | P-2 | CA-16(M6) |

*Optional

## BLS sleeves

Sleeves for boring bars with square shank (regular length)



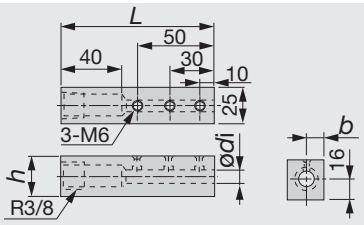

| Designation | ødi | L | h | b |
|---|---|---|---|---|
| BLS16-08 | 8 | 125 | 28 | 12.5 |
| BLS16-10 | 10 | 125 | 28 | 12.5 |
| BLS16-12 | 12 | 125 | 28 | 12.5 |

**SPARE PARTS**

| Designation | Wrench |
|---|---|
| BLS16-... | P-3 |

## BLS-C sleeves

Sleeves for boring bars with square shank (short type)



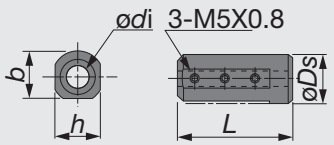

| Designation | ødi | L | h | b |
|---|---|---|---|---|
| BLS16-08C | 8 | 100 | 28 | 12.5 |
| BLS16-10C | 10 | 100 | 28 | 12.5 |
| BLS16-12C | 12 | 100 | 28 | 12.5 |

**SPARE PARTS**

| Designation | Wrench |
|---|---|
| BLS16-**C | P-3 |

## BLM sleeves

Sleeves for boring bars with round shank



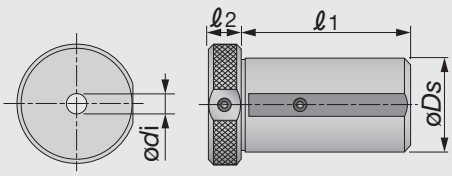

| Designation | ødi | øDs | L | h | b |
|---|---|---|---|---|---|
| BLM19-08 | 8 | 19.05 | 100 | 18 | 18 |
| BLM20-08 | 8 | 20 | 100 | 19 | 18 |
| BLM22-08 | 8 | 22 | 125 | 21 | 21 |
| BLM254-08 | 8 | 25.4 | 125 | 24 | 24 |
| BLM25-08C | 8 | 25 | 55 | 24 | 23 |
| BLM25-10C | 10 | 25 | 55 | 24 | 23 |
| BLM25-12C | 12 | 25 | 55 | 24 | 23 |

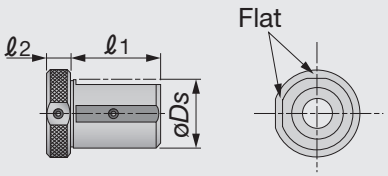
### SPARE PARTS

| Designation | Wrench |
|---|---|
| BLM... | P-2.5 |

## BLC sleeves

Standard Sleeves for boring bars with round shank




| Designation | ødi | ℓ1 | ℓ2 | øDs |
|---|---|---|---|---|
| BLC40-8 | 8 | 73 | 13 | 40 |
| BLC40-10 | 10 | 73 | 13. | 40 |
| BLC40-12 | 12 | 73 | 13 | 40 |
| BLC40-16 | 16 | 73 | 13 | 40 |
| BLC32-8C | 8 | 45 | 20 | 32 |
| BLC32-10C | 10 | 45 | 20 | 32 |
| BLC32-12C | 12 | 45 | 20 | 32 |
| BLC40-8C | 8 | 55 | 13 | 40 |
| BLC40-10C | 10 | 55 | 13 | 40 |
| BLC40-12C | 12 | 55 | 13 | 40 |
| BLC40-16C | 16 | 55 | 13 | 40 |

### SPARE PARTS

| Designation | Wrench |
|---|---|
| BLC40-8 | P-3 |
| BLC40-1... | P-4 |
| BLC32-8C | P-3 |
| BLC32-1*C | P-4 |
| BLC40-8C | P-3 |
| BLC40-1*C | P-4 |

MEMO



## MINIFORCE TURN

B188, B268

Economical double-sided inserts with excellent sharpness



## TETRAMINI CUT

C049

Unique insert geometry for highly precise grooving

***W*** = 0.33 - 3.0 mm



## TETRAFORCE CUT

C041

4-cornered inserts with good clamping rigidity for highly precise grooving and parting

***W*** = 0.5 - 3.18 mm



## DUOJUST CUT

C009

Innovative clamping system for stable parting operations

***W*** = 1.0 - 2.0 mm



## TUNGCUT

C053

Multi-functional tool series for various grooving operations

***W*** = 1.4 - 8.0 mm

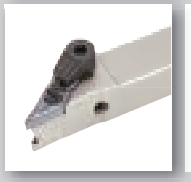


## TUNGHEAVY GROOVE

C123

Highly rigid clamping system for wide grooving and profiling in one pass

***W*** = 10 - 25 mm



## J-SERIES

B328

Toolholders for small-part machining



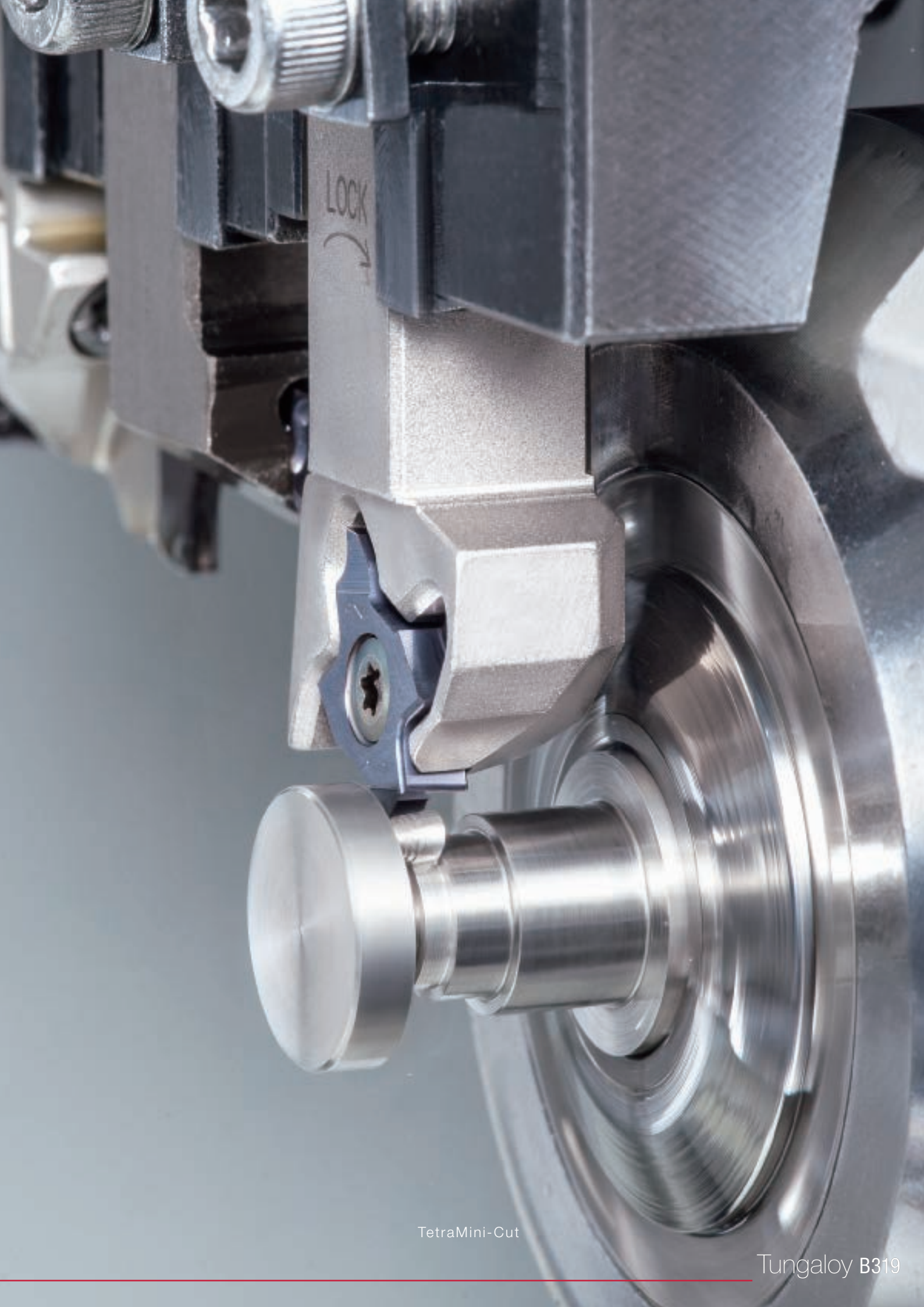
## TINYMINI TURN

B352

Solid boring bars for turning small diameters with high precision

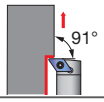
## Other Tool for Miniature Machining

B375

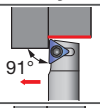
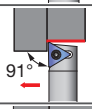
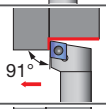
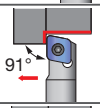
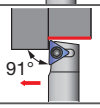

LOCK

# Miniature External Turning - Quick Guide

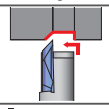
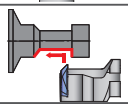
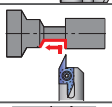
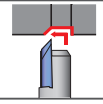
## Facing

| Style | Description | Type of insert | | Shank Size | Clamping style | |
|---|---|---|---|---|---|---|
| | | Positive | Negative | | | |
|   | **JSDFCR/L**<br>Cutting edge angle 91°<br>Insert type: DC☐☐ | ✓ | | 12 - 16 mm | Screw-on clamping with offset | B335 |

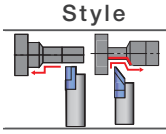
## External Turning

| Style | Description | Type of insert | | Shank Size | Clamping style | |
|---|---|---|---|---|---|---|
| | | Positive | Negative | | | |
|   | **JTTACR/L**<br>Cutting edge angle 91°<br>Insert type: TC☐☐ | ✓ | | 8 - 16 mm | Back side clamping without offset | B336 |
|   | **JSTACR/L**<br>Cutting edge angle 91°<br>Insert type: TC☐☐ | ✓ | | 8 - 16 mm | Screw-on clamping without offset | B336 |
|   | **JSCGCR/L**<br>Cutting edge angle 91°<br>Insert type: CC☐☐ | ✓ | | 12 - 16 mm | Screw-on clamping with offset | B331 |
|   | **JSCACL**<br>Cutting edge angle 91°<br>Insert type: CC☐☐ | ✓ | | 10 - 12 mm | Screw-on clamping without offset | B330 |
|   | **JTTANR/L**<br>Cutting edge angle 91°<br>Insert type: TN☐☐ | | ✓ | 12 - 16 mm | Back side clamping without offset | B343 |

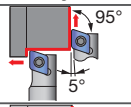
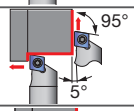
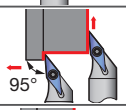
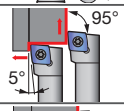
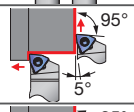
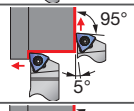
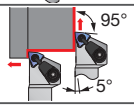
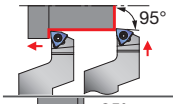
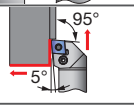
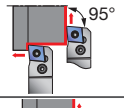
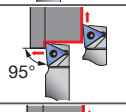
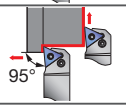
## Back Turning

| Style | Description | Type of insert | | Shank Size | Clamping style | |
|---|---|---|---|---|---|---|
| | | Positive | Negative | | | |
|  | **JSTBR/L**<br>Insert type: JTBR/L3☐☐ | ✓ | | 10 - 16 mm | Screw-on clamping | B347 |
|  | **JS-TBL3**<br>Insert type: JTBR3☐☐ | ✓ | | ø19.05 - 25.4 mm | Screw-on clamping | B347 |
|  | **JSEGR/L**<br>Insert type: J10ER/L☐☐ | ✓ | | 10 - 16 mm | Screw-on clamping | B349 |
|  | **JSXBR/L**<br>Insert type: JXBR/L8☐☐ | ✓ | | 10 - 25 mm | Screw-on clamping | B346 |

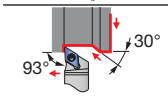
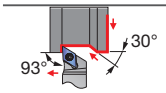
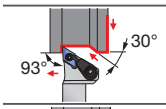
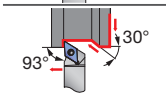
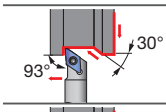
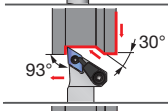
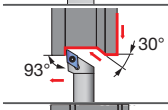
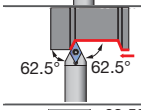
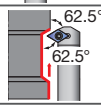
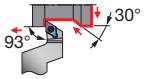
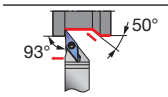
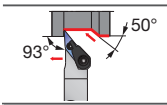
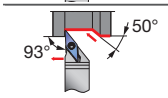
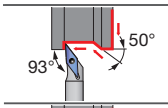
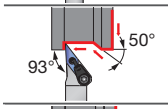
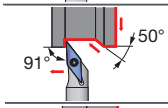
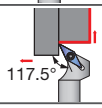
## Front & Reverse Turning

| Style | Description | Type of insert | | Shank Size | Clamping style | |
|---|---|---|---|---|---|---|
| | | Positive | Negative | | | |
|  | **JSXGR/L**<br>Insert type: JXFR/L8<br>JXRR/L8 | ✓ | | 10 - 25 mm | Screw-on clamping | B345 |

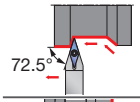
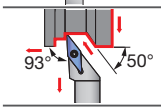
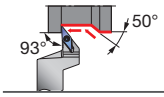
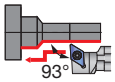
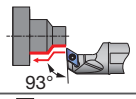
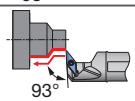
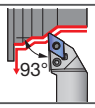
## External Turning & Facing

| Style | Description | Type of insert | | Shank Size | Clamping style | |
|---|---|---|---|---|---|---|
| | | Positive | Negative | | | |
|  | **JTCL2CR/L**<br>Cutting edge angle 95°<br>Insert type: CC☐☐ | ✓ | | 8 - 16 mm | Back side clamping without offset | B328 |
|  | **JSCL2CR/L**<br>Cutting edge angle 95°<br>Insert type: CC☐☐ | ✓ | | 10 - 16 mm | Screw-on clamping without offset | B328 |
|  | **JSVL2PR/L**<br>Cutting edge angle 95°<br>Insert type: VP☐☐ | ✓ | | 10 - 16 mm | Screw-on clamping without offset | B341 |
|  | **JSCLCR/L**<br>Cutting edge angle 95°<br>Insert type: CC☐☐ | ✓ | | 8 - 16 mm | Screw-on clamping with offset | B329 |
|  | **JPWL2XR/L**<br>Cutting edge angle 95°<br>Insert type: WXGU | ✓ | | 10 - 16 mm | Side clamping without offset | B188 |
|  | **JSWL2XR/L**<br>Cutting edge angle 95°<br>Insert type: WXGU | ✓ | | 10 - 20 mm | Screw-on clamping without offset | B188 |
|  | **JSWL2XR/L-CHP**<br>Cutting edge angle 95°<br>Insert type: WXGU | ✓ | | 12 mm | Screw-on clamping without offset | B189 |
|  | **JSWLXR-F**<br>Cutting edge angle 95°<br>Insert type: WXGU | ✓ | | 10 - 16 mm | Screw-on clamping with offset | B189 |
|  | **PCLNR**<br>Cutting edge angle 95°<br>Insert type: CN☐☐ | | ✓ | 20 mm | Lever-lock clamping with offset | B342 |
|  | **PCL2NR**<br>Cutting edge angle 95°<br>Insert type: CN☐☐ | | ✓ | 20 mm | Lever-lock clamping without offset | B342 |
|  | **JTTLNR/L**<br>Cutting edge angle 95°<br>Insert type: TN☐☐ | | ✓ | 12 - 16 mm | Back side clamping without offset | B343 |
|  | **PTL2NR/L**<br>Cutting edge angle 95°<br>Insert type: TN☐☐ | | ✓ | 20 mm | Lever-lock clamping without offset | B344 |

## External Turning & Profiling

| Style | Description | Type of insert | | Shank Size | Clamping style | |
|---|---|---|---|---|---|---|
| | | Positive | Negative | | | |
|  | **JPDJ2XR/L**<br>Cutting edge angle 93°<br>Insert type: DXGU | ✓ | | 10 - 16 mm | Side clamping without offset | B190 |
|  | **JSDJ2XR/L**<br>Cutting edge angle 93°<br>Insert type: DXGU | ✓ | | 10 - 20 mm | Screw-on clamping without offset | B190 |
|  | **JSDJ2XR/L-CHP**<br>Cutting edge angle 93°<br>Insert type: DXGU | ✓ | | 12 mm | Screw-on clamping without offset | B191 |
|  | **JTDJ2CR/L**<br>Cutting edge angle 93°<br>Insert type: DC□□ | ✓ | | 10 - 16 mm | Back side clamping without offset | B332 |
|  | **JSDJ2CR/L**<br>Cutting edge angle 93°<br>Insert type: DC□□ | ✓ | | 8 - 16 mm | Screw-on clamping without offset | B331 |
|  | **JSDJ2CR/L-CHP**<br>Cutting edge angle 93°<br>Insert type: DC□□ | ✓ | | 12 mm | Screw-on clamping without offset | B333 |
|  | **JSDJCR/L**<br>Cutting edge angle 93°<br>Insert type: DC□□ | ✓ | | 8 - 16 mm | Screw-on clamping with offset | B333 |
|  | **JSDNCN**<br>Cutting edge angle 62.5°<br>Insert type: DC□□ | ✓ | | 10 - 16 mm | Screw-on clamping with offset | B334 |
|  | **JSDN3CR/L**<br>Cutting edge angle 62.5°<br>Insert type: DC□□ | ✓ | | 12 - 16 mm | Screw-on clamping with offset | B334 |
|  | **JSDJXR-F**<br>Cutting edge angle 93°<br>Insert type: DXGU | ✓ | | 10 - 16 mm | Screw-on clamping with offset | B191 |
|  | **JPVJ2XR/L**<br>Cutting edge angle 93°<br>Insert type: VXGU | ✓ | | 10 - 16 mm | Side clamping without offset | B192 |
|  | **JSVJ2XR/L-CHP**<br>Cutting edge angle 93°<br>Insert type: VXGU | ✓ | | 12 mm | Screw-on clamping without offset | B193 |
|  | **JSVJ2XR/L**<br>Cutting edge angle 93°<br>Insert type: VXGU | ✓ | | 10 - 20 mm | Screw-on clamping without offset | B192 |
|  | **JSVJ2BR/L**<br>Cutting edge angle 93°<br>Insert type: VB□□ | ✓ | | 10 - 16 mm | Screw-on clamping without offset | B337 |
|  | **JSVJ2BR/L-CHP**<br>Cutting edge angle 93°<br>Insert type: VB□□ | ✓ | | 12 mm | Screw-on clamping without offset | B338 |
|  | **JSVABR/L**<br>Cutting edge angle 91°<br>Insert type: VB□□ | ✓ | | 10 - 16 mm | Screw-on clamping without offset | B338 |
|  | **JSVP2PR/L**<br>Cutting edge angle 117.5°<br>Insert type: VP□□ | ✓ | | 10 - 16 mm | Screw-on clamping without offset | B341 |

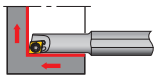
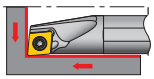
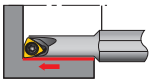
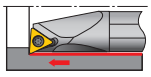
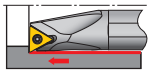
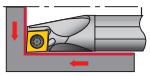
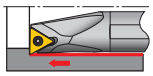
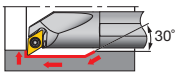
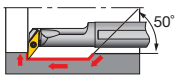
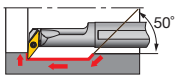
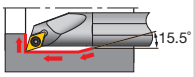
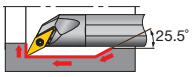
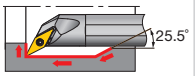
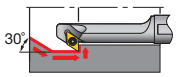
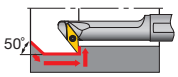
## External Turning & Profiling

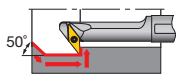
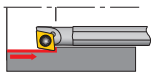
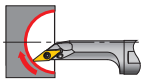
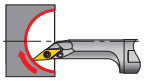
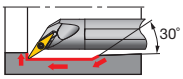
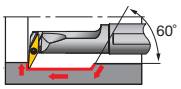
| Style | Description | Type of insert | | Shank Size | Clamping style | |
|---|---|---|---|---|---|---|
| | | Positive | Negative | | | |
|  | **JSVNBN**<br>Cutting edge angle 72.5°<br>Insert type: VB□□ | ✓ | | 10 - 16 mm | Screw-on clamping with offset | B340 |
|  | **JSVJBR/L**<br>Cutting edge angle 93°<br>Insert type: VB□□ | ✓ | | 10 - 16 mm | Screw-on clamping with offset | B337 |
|  | **JSVJXR-F**<br>Cutting edge angle 93°<br>Insert type: VXGU | ✓ | | 10 - 16 mm | Screw-on clamping with offset | B193 |
|  | **JS-SDUCL**<br>Cutting edge angle 93°<br>Insert type: DC□□ | ✓ | | ø19.05 - 25.4 mm | Screw-on clamping with offset | B335 |
|  | **JS-SDUXL**<br>Cutting edge angle 93°<br>Insert type: DXGU | ✓ | | ø14 - 25.4 mm | Screw-on clamping with offset | B194 |
|  | **JS-SVUXL**<br>Cutting edge angle 93°<br>Insert type: VXGU | ✓ | | ø15.875 - 25.4 mm | Screw-on clamping with offset | B194 |
|  | **PDJNR**<br>Cutting edge angle 93°<br>Insert type: DN□□ | | ✓ | 20 mm | Lever-lock clamping with offset | B342 |

# Miniature Internal Turning - Quick Guide



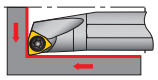
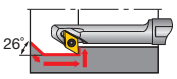
## Positive type

| Style | StreamJet-Bar Description & Application | ISO Insert | Y-Pro | Shank Type | Shank Ø | Min. bore diameter (mm) 0 10 20 30 40 50 | |
|---|---|---|---|---|---|---|---|
|  | **SEXPR/L**<br>Boring & Internal facing<br>Insert type: EP□□ | ✓ | | Steel<br>Carbide | ø4 - ø8<br>ø4 - ø8 | ø4.5 ø7<br>ø4.5 ø7 | B279 |
|  | **SCLCR/L**<br>Boring & internal facing<br>Insert type: CC□□ | ✓ | | Steel<br>Carbide | ø4 - ø25<br>ø4 - ø25 | ø5 ø27<br>ø5 ø27 | B278 |
|  | **SWUBR/L**<br>Boring<br>Insert type: WB□□ | ✓ | | Steel<br>Carbide | ø5 - ø8<br>ø5 - ø8 | ø6 ø8<br>ø6 ø8 | B286 |
|  | **STUPR/L**<br>Boring<br>Insert type: TP□□ | ✓ | | Steel<br>Carbide | ø7 - ø32<br>ø7 - ø25 | ø8 ø34<br>ø8 ø27 | B285 |
|  | **STFPR/L**<br>Blind hole boring<br>Insert type: TP□□ | ✓ | | Steel<br>Carbide | ø8 - ø25<br>ø8 - ø20 | ø10 ø27<br>ø10 ø22 | B284 |
|  | **SCLPR/L**<br>Boring & internal facing<br>Insert type: CP□□ | ✓ | | Steel<br>Carbide | ø8 - ø25<br>ø8 - ø16 | ø10 ø27<br>ø10 ø20 | B280 |
|  | **STFCR/L**<br>Blind hole boring<br>Insert type: TC□□ | ✓ | | Steel<br>Carbide | ø10 - ø16<br>ø10 - ø16 | ø12 ø18<br>ø12 ø18 | B283 |
|  | **SDUCR/L**<br>Boring & internal profiling<br>Insert type: DC□□ | ✓ | | Steel<br>Carbide | ø10 - ø25<br>ø10 - ø20 | ø13 ø32<br>ø13 ø27 | B287 |
|  | **SVUCR/L**<br>Boring & internal profiling<br>Insert type: VC□□ | ✓ | | Steel<br>Carbide | ø12 - ø25<br>ø12 - ø25 | ø16 ø32<br>ø18 ø32 | B288 |
|  | **SVUBR/L**<br>Boring & internal profiling<br>Insert type: VB□□ | ✓ | | Steel<br>Carbide | ø16 - ø25<br>ø16 - ø25 | ø20 ø32<br>ø24.5 ø34 | B287 |
|  | **SDQCR/L**<br>Boring & internal profiling<br>Insert type: DC□□ | ✓ | | Steel<br>Carbide | ø10 - ø25<br>ø10 - ø20 | ø13 ø30<br>ø13 ø25 | B288 |
|  | **SVQCR/L**<br>Boring & internal profiling<br>Insert type: VC□□ | ✓ | | Steel<br>Carbide | ø10 - ø16<br>ø10 - ø16 | ø13.5 ø21.5<br>ø13.5 ø21.5 | B289 |
|  | **SVQBR/L**<br>Boring & internal profiling<br>Insert type: VB□□ | ✓ | | Steel<br>Carbide | ø12 - ø25<br>ø12 - ø25 | ø17 ø30.5<br>ø17 ø30.5 | B289 |
|  | **SDZCR/L**<br>Internal retracting<br>Insert type: DC□□ | ✓ | | Steel<br>Carbide | ø12 - ø25<br>ø12 - ø16 | ø14 ø25<br>ø18 ø22 | B290 |
|  | **SVZCR/L**<br>Internal retracting<br>Insert type: VC□□ | ✓ | | Steel | ø12 | ø16 | B291 |

| Style | StreamJet-Bar Description & Application | ISO Insert | Y-Pro | Shank Type | Shank Ø | Min. bore diameter (mm) 0 10 20 30 40 50 | |
|---|---|---|---|---|---|---|---|
|   | **SVZBR/L**<br>Internal retracting<br>Insert type: VB□□ | ✓ | | Steel | ø16 - ø32 | ø20 ø40 | B291 |
|  | **SEZPR/L**<br>Internal retracting<br>Insert type: EP□□ | ✓ | | Steel<br>Carbide | ø4 - ø5<br>ø4 - ø5 | ø5.5 ø6.5<br>ø5.5 ø6.5 | B292 |
|  | **SVJCR/L**<br>Internal sphere cutting<br>Insert type: VC□□ | ✓ | | Steel | ø12 - ø16 | ø16 ø20 | B282 |
|  | **SVJBR/L**<br>Internal sphere cutting<br>Insert type: VB□□ | ✓ | | Steel | ø20 - ø25 | ø25 ø30 | B282 |
|   | **SYQBR/L**<br>Internal undercut & profiling<br>Insert type: YW□□ | | ✓ | Steel<br>Carbide | ø12 - ø16<br>ø12 - ø16 | ø17 ø21.5<br>ø17 ø21.5 | B300 |
|   | **SYUBR/L**<br>Boring & internal profiling<br>Insert type: YW□□ | | ✓ | Steel<br>Carbide | ø16<br>ø12 - ø16 | ø20<br>ø20 ø24.5 | B300 |

# Miniature Internal Turning - Quick Guide

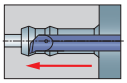
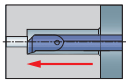
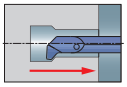
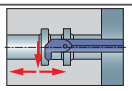
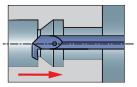
## Double-sided insert with positive cutting edges

| Style | MiniForce-Turn Description & Application | MiniForce -Turn | Shank Type | Shank Ø | Min. bore diameter (mm) 0 10 20 30 40 50 | |
|---|---|---|---|---|---|---|
|  | **SWLXR/L**<br>Boring & facing<br>Insert type: WXGU | ✓ | Steel<br>Carbide | ø10 - ø20<br>ø10 - ø20 | ø12 ø22<br>ø12 ø22 | B268 |
|   | **SDXXR/L**<br>Internal profiling<br>Insert type: DXGU | ✓ | Steel<br>Carbide | ø10 - ø20<br>ø10 - ø20 | ø13 ø24<br>ø13 ø24 | B268 |
|   | **SDZXR/L**<br>Internal retracting<br>Insert type: DXGU | ✓ | Steel<br>Carbide | ø12 - ø20<br>ø12 - ø16 | ø14 ø20<br>ø18 ø22 | B269 |

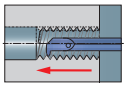
# Miniature Internal Turning - Quick Guide

**TinyMini-Turn -** Solid carbide tools for small diameters turning

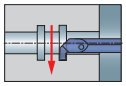
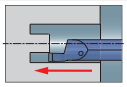
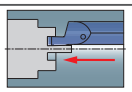
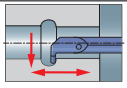
## Boring, profiling, chamfering

| Style | TinyMini-Turn Description & Application | Shank øDs | Min. bore diameter øDm (mm) 0 2 4 6 8 10 | |
|---|---|---|---|---|
|  | **JBT** Boring, profiling, & chamfering | ø4 & ø7 | ø0.6 – ø7 | B352 |
|  | **JBP** Boring & chamfering | ø4 & ø7 | ø2.8 – ø5 | B353 |
|  | **JBU** Back boring & chamfering | ø7 | ø5 | B353 |
|  | **JBC** Boring & 45° chamfering | ø7 | ø5 – ø6.8 | B353 |
|  | **JBB** Back boring | ø4 & ø7 | ø3 – ø7 | B354 |

## Threading

| Style | TinyMini-Turn Description & Application | Shank øDs | Min. bore diameter øDm (mm) 0 2 4 6 8 10 | |
|---|---|---|---|---|
|  | **JBI** Threading (Metric thread) | ø4 & ø7 | ø4 – ø7 | B354 |

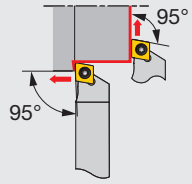
## Grooving

| Style | TinyMini-Turn Description & Application | Shank øDs | Groove width | Min. bore diameter øDm (mm) 0 2 4 6 8 10 12 14 15 | |
|---|---|---|---|---|---|
|  | **JBG** Grooving | ø4 & ø7 | 0.5 - 2 | ø2 – ø6.8 | B355 |
|  | **JBF** Face grooving | ø7 | 1 - 3 | ø6 – ø15 | B356 |
|  | **JBS** Face grooving (for shaft) | ø7 | 2 | ø6 | B356 |
|  | **JBR** Boring & profiling (full radius type) | ø7 | 1 | ø5 – ø6.8 | B357 |

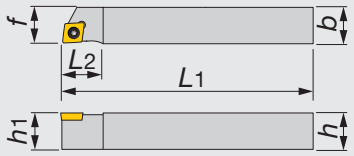
MEMO

# J-SERIES
## JSCL2CR/L

Screw-on toolholder without offset with 95° approach angle for positive 80° rhombic inserts




Cutting edge style **L2**




Without offset

Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| JSCL2CR/L1010X06 | 10 | 10 | 120 | 12 | 10 | 10 | 0.2 | CC**0602... | 1.2 |
| JSCL2CR/L1212F06 | 12 | 12 | 85 | 12 | 12 | 12 | 0.2 | CC**0602... | 1.2 |
| JSCL2CR/L1212X06 | 12 | 12 | 120 | 12 | 12 | 12 | 0.2 | CC**0602... | 1.2 |
| JSCL2CL1212K06 | 12 | 12 | 125 | 12 | 12 | 12 | 0.4 | CC**0602... | 1.2 |
| JSCL2CR/L1212F09 | 12 | 12 | 85 | 16 | 12 | 12 | 0.2 | CC**09T3... | 1.2 |
| JSCL2CR/L1212X09 | 12 | 12 | 120 | 16 | 12 | 12 | 0.2 | CC**09T3... | 1.2 |
| JSCL2CR/L1616X09 | 16 | 16 | 120 | 16 | 16 | 16 | 0.2 | CC**09T3... | 1.2 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

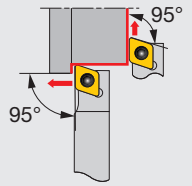
### SPARE PARTS



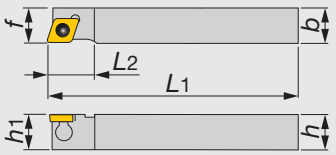

| Designation | Clamping screw | Wrench |
|---|---|---|
| JSCL2CR/L**06 | CSTB-2.5 | T-8F |
| JSCL2CR/L**09 | CSTB-4SD | T-8F |

# J-SERIES
## JTCL2CR/L

Back clamp toolholder without offset with 95° approach angle for positive 80° rhombic inserts




Cutting edge style **L2**




Without offset

Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| JTCL2CL0810K06 | 8 | 10 | 125 | 12 | 8 | 10 | 0.4 | CC**0602... | 0.9 |
| JTCL2CR/L1010X06 | 10 | 10 | 120 | 12 | 10 | 10 | 0.2 | CC**0602... | 0.9 |
| JTCL2CR/L1212F09 | 12 | 12 | 85 | 16 | 12 | 12 | 0.2 | CC**09T3... | 1.2 |
| JTCL2CR/L1212X09 | 12 | 12 | 120 | 16 | 12 | 12 | 0.2 | CC**09T3... | 1.2 |
| JTCL2CR/L1616X09 | 16 | 16 | 120 | 16 | 16 | 16 | 0.2 | CC**09T3... | 1.2 |
| JTCL2CR1616M09 | 16 | 16 | 150 | 16 | 16 | 16 | 0.8 | CC**09T3... | 1.2 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS



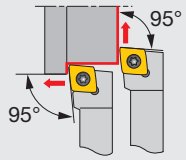


| Designation | Clamp | Clamping screw | Wrench |
|---|---|---|---|
| JTCL2CR/L**06 | JCP-2 | JDS-3525 | P-2F |
| JTCL2CR/L**09 | JCP-3 | JDS-5040 | P-2.5F |

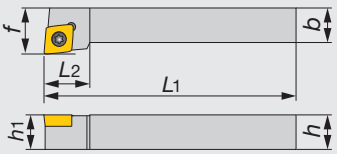
JSCL2CR/L, JTCL2CR/L: Inserts → **B104 -**, CBN → **B168 -**, PCD → **B177**

# J-SERIES
## JSCLCR/L

Screw-on toolholder with 95° approach angle for positive 80° rhombic inserts




Cutting edge style **L**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | r$_\varepsilon$** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| JSCLCR/L0808H06 | 8 | 8 | 100 | 12 | 8 | 10 | 0.4 | CC**0602... | 1.2 |
| JSCLCR/L1010H06 | 10 | 10 | 100 | 12 | 10 | 12 | 0.4 | CC**0602... | 1.2 |
| JSCLCR/L1212H09 | 12 | 12 | 100 | 16 | 12 | 16 | 0.8 | CC**09T3... | 1.2 |
| JSCLCR/L1616H09 | 16 | 16 | 100 | 16 | 16 | 20 | 0.8 | CC**09T3... | 1.2 |

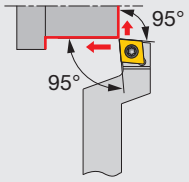
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

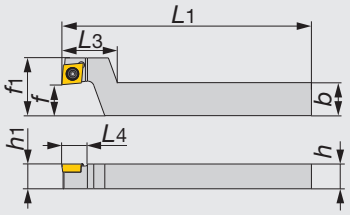
| Designation | Clamping screw | Wrench |
|---|---|---|
| JSCLCR/L**H06 | CSTB-2.5 | T-8F |
| JSCLCR/L**H09 | CSTB-4SD | T-8F |

# J-SERIES
## JSCLCR-F

Screw-on stepped-head toolholder with 95° approach angle for positive 80° rhombic inserts




Cutting edge style **L**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *L*3 | *L*4 | *h*1 | *f* | f1 | r$_\varepsilon$** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JSCLCR1216F09-F15 | 12 | 16 | 85 | 12 | 27 | 12.5 | 12 | 15 | 28 | 0.2 | CC**09T3... | 1.2 |
| JSCLCR1216X09-F15 | 12 | 16 | 120 | 12 | 27 | 12.5 | 12 | 15 | 28 | 0.2 | CC**09T3... | 1.2 |
| JSCLCR1620X09-F15 | 16 | 20 | 120 | 12 | 27 | 12.5 | 16 | 15 | 28 | 0.2 | CC**09T3... | 1.2 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

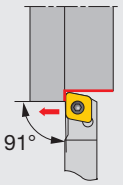
| Designation | Clamping screw | Wrench |
|---|---|---|
| JSCLCR**F15 | CSTB-4SD | T-8F |

JSCLCR/L, JSCLCR-F: Inserts → **B104 -**, CBN → **B168 -**, PCD → **B177**

# JSCACL

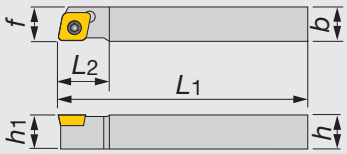
Screw-on toolholder without offset with 91° approach angle for positive 80° rhombic inserts






Cutting edge style **A**

Without offset




Right hand (R) shown.

| Designation | *h* | *b* | $L_1$ | $L_2$ | $h_1$ | *f* | $r_\varepsilon$** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| JSCACL1010H06 | 10 | 10 | 100 | 12 | 10 | 10 | 0.4 | CC**0602... | 1.2 |
| JSCACL1212H09 | 12 | 12 | 100 | 16 | 12 | 12 | 0.8 | CC**09T3... | 1.2 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

## SPARE PARTS

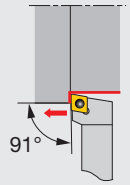



| Designation | Clamping screw | Wrench |
|---|---|---|
| JSCACL1010H06 | CSTB-2.5 | T-8F |
| JSCACL1212H09 | CSTB-4SD | T-8F |

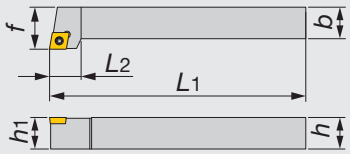
JSCACL: Inserts → **B104 -**, CBN → **B168 -**, PCD → **B177**

# J-SERIES
## JSCGCR/L

Screw-on toolholder with 91° approach angle for positive 80° rhombic inserts




Cutting edge style **G**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| JSCGCR/L1212H06 | 12 | 12 | 100 | 12 | 12 | 16 | 0.4 | CC**0602... | 1.2 |
| JSCGCR/L1616H09 | 16 | 16 | 100 | 16 | 16 | 20 | 0.8 | CC**09T3... | 1.2 |

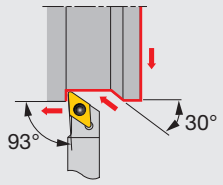
*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

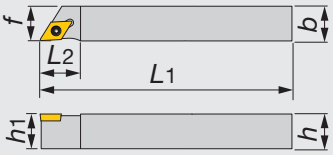
| Designation | Clamping screw | Wrench |
|---|---|---|
| JSCGCR/L1212H06 | CSTB-2.5 | T-8F |
| JSCGCR/L1616H09 | CSTB-4SD | T-8F |

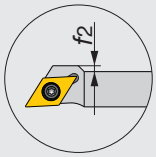
# J-SERIES
## JSDJ2CR/L

Screw-on toolholder without offset with 93° approach angle for positive 55° rhombic inserts




Cutting edge style **J2**




Without offset
JSDJ2CR/L1010X11
JSDJ2CR/L1212F11
JSDJ2CR/L1212X11

Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *f*2 | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| JSDJ2CR/L0808F07 | 8 | 8 | 85 | 14 | 8 | 8 | - | 0.2 | DC**0702... | 1.2 |
| JSDJ2CR/L1010X07 | 10 | 10 | 120 | 14 | 10 | 10 | - | 0.2 | DC**0702... | 1.2 |
| JSDJ2CR/L1010X11 | 10 | 10 | 120 | 20 | 10 | 10 | 4 | 0.2 | DC**11T3... | 1.2 |
| JSDJ2CR/L1212F07 | 12 | 12 | 85 | 14 | 12 | 12 | - | 0.2 | DC**0702... | 1.2 |
| JSDJ2CR/L1212F11 | 12 | 12 | 85 | 20 | 12 | 12 | 2 | 0.2 | DC**11T3... | 1.2 |
| JSDJ2CR/L1212X07 | 12 | 12 | 120 | 14 | 12 | 12 | - | 0.2 | DC**0702... | 1.2 |
| JSDJ2CL1212K07 | 12 | 12 | 125 | 14 | 12 | 12 | - | 0.4 | DC**0702... | 1.2 |
| JSDJ2CR/L1212X11 | 12 | 12 | 120 | 20 | 12 | 12 | 2 | 0.2 | DC**11T3... | 1.2 |
| JSDJ2CR/L1616X11 | 16 | 16 | 120 | 20 | 16 | 16 | - | 0.2 | DC**11T3... | 1.2 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

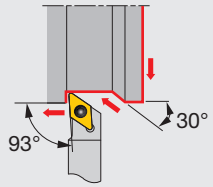
| Designation | Clamping screw | Wrench |
|---|---|---|
| JSDJ2CR/L**07 | CSTB-2.5 | T-8F |
| JSDJ2CR/L**11 | CSTB-4SD | T-8F |

JSCGCR/L: Inserts → **B104 -**, CBN → **B168 -**, PCD → **B177**

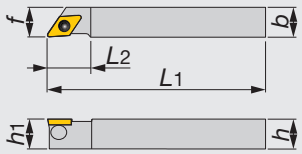
JSDJ2CR/L: Inserts → **B114 -**, CBN → **B168 -**, PCD → **B177**

# J-SERIES
## JTDJ2CR/L

Back clamp toolholder without offset with 93° approach angle for positive 55° rhombic inserts

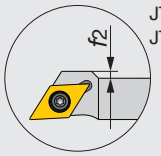



Cutting edge style **J2**




Without offset

JTDJ2CR/L1212F11
JTDJ2CR/L1212X11




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *f*2 | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| JTDJ2CR/L1010X07 | 10 | 10 | 120 | 14 | 10 | 10 | - | 0.2 | DC**0702... | 0.9 |
| JTDJ2CR/L1212F07 | 12 | 12 | 85 | 14 | 12 | 12 | - | 0.2 | DC**0702... | 0.9 |
| JTDJ2CR/L1212X07 | 12 | 12 | 120 | 14 | 12 | 12 | - | 0.2 | DC**0702... | 0.9 |
| JTDJ2CR/L1212F11 | 12 | 12 | 85 | 20 | 12 | 12 | 2 | 0.2 | DC**11T3... | 1.2 |
| JTDJ2CR/L1212X11 | 12 | 12 | 120 | 20 | 12 | 12 | 2 | 0.2 | DC**11T3... | 1.2 |
| JTDJ2CL1212M11 | 12 | 12 | 150 | 20 | 12 | 12 | - | 0.8 | DC**11T3... | 1.2 |
| JTDJ2CR/L1616X11 | 16 | 16 | 120 | 20 | 16 | 16 | - | 0.2 | DC**11T3... | 1.2 |

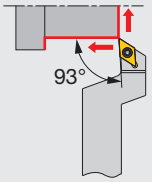
*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

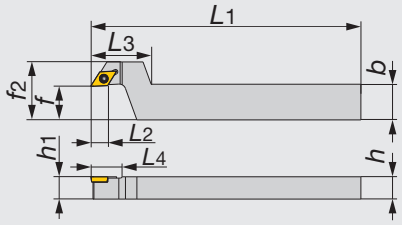
| Designation | Clamp | Clamping screw | Wrench |
|---|---|---|---|
| JTDJ2CR/L**07 | JCP-2 | JDS-3525 | P-2F |
| JTDJ2CR/L**11 | JCP-3 | JDS-5040 | P-2.5F |

# J-SERIES
## JSDJCR-F

Screw-on stepped-head toolholder with 93° approach angle for positive 55° rhombic inserts




Cutting edge style **J**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *L*3 | *L*4 | *h*1 | *f* | f2 | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JSDJCR1016X07-F15 | 10 | 16 | 120 | 12.5 | 27 | 14 | 10 | 15 | 26 | 0.2 | DC**0702... | 1.2 |
| JSDJCR1216F07-F15 | 12 | 16 | 85 | 12.5 | 27 | 14 | 12 | 15 | 26 | 0.2 | DC**0702... | 1.2 |
| JSDJCR1216X07-F15 | 12 | 16 | 120 | 12.5 | 27 | 14 | 12 | 15 | 26 | 0.2 | DC**0702... | 1.2 |
| JSDJCR1216F11-F15 | 12 | 16 | 85 | 12.5 | 27 | 20 | 12 | 15 | 28 | 0.2 | DC**11T3... | 1.2 |
| JSDJCR1216X11-F15 | 12 | 16 | 120 | 12.5 | 27 | 20 | 12 | 15 | 28 | 0.2 | DC**11T3... | 1.2 |
| JSDJCR1620X11-F15 | 16 | 20 | 120 | 12.5 | 27 | 20 | 16 | 15 | 28 | 0.2 | DC**11T3... | 1.2 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

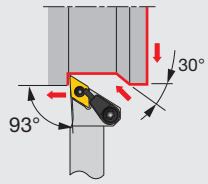
### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| JSDJCR**07-F15 | CSTB-2.5 | T-8F |
| JSDJCR**11-F15 | CSTB-4SD | T-8F |

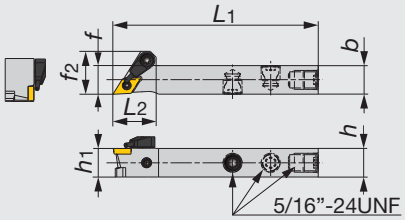
JTDJ2CR/L, JSDJCR-F: Inserts → **B114 -**, CBN → **B168 -**, PCD → **B177**

## JSDJ2CR/L-CHP

Screw-on toolholder without offset with 93° approach angle for positive 55° rhombic inserts, with channels for high pressure coolant




Cutting edge style **J2**




Without offset

Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *f*2 | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| JSDJ2CR/L1212F07-CHP | 12 | 12 | 85 | 18 | 12 | 12 | 18 | 0.2 | DC**0702... | 1.2 |
| JSDJ2CR/L1212F11-CHP | 12 | 12 | 85 | 19 | 12 | 12 | 20.5 | 0.2 | DC**11T3... | 1.2 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

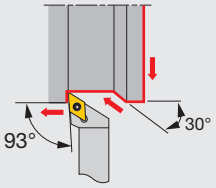
### SPARE PARTS

| Designation | Clamping screw | Coolant unit | Wrench |
|---|---|---|---|
| JSDJ2CR/L1212F07-CHP | CSTB-2.5 | S-CU-CHP | T-8F |
| JSDJ2CR/L1212F11-CHP | CSTB-4SD | S-CU-CHP | T-8F |

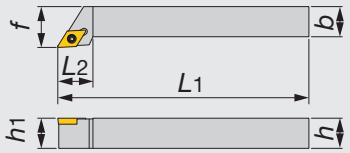


## JSDJCR/L

Screw-on toolholder with 93° approach angle for positive 55° rhombic inserts




Cutting edge style **J**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| JSDJCR/L0808H07 | 8 | 8 | 100 | 14 | 8 | 10 | 0.4 | DC**0702... | 1.2 |
| JSDJCR/L1010H11 | 10 | 10 | 100 | 18 | 10 | 12 | 0.8 | DC**11T3... | 1.2 |
| JSDJCR/L1212H07 | 12 | 12 | 100 | 14 | 12 | 16 | 0.4 | DC**0702... | 1.2 |
| JSDJCR/L1212H11 | 12 | 12 | 100 | 18 | 12 | 16 | 0.8 | DC**11T3... | 1.2 |
| JSDJCR/L1616H11 | 16 | 16 | 100 | 18 | 16 | 20 | 0.8 | DC**11T3... | 1.2 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

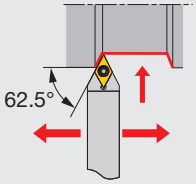
### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| JSDJC**H07 | CSTB-2.5 | T-8F |
| JSDJC**H11 | CSTB-4SD | T-8F |

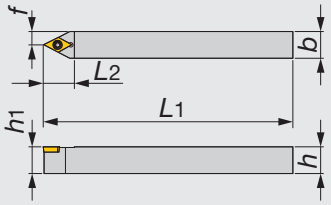
JSDJ2CR/L-CHP, JSDJCR/L: Inserts → **B114 -**, CBN → **B168 -**, PCD → **B177**

# J-SERIES
## JSDNCN

Screw-on toolholder with 62.5° approach angle for positive 55° rhombic inserts




Cutting edge style **N**




| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| JSDNCN1010X07 | 10 | 10 | 120 | 15 | 10 | 5 | 0.2 | DC**0702... | 1.2 |
| JSDNCN1010X11 | 10 | 10 | 120 | 21 | 10 | 5 | 0.2 | DC**11T3... | 1.2 |
| JSDNCN1212F07 | 12 | 12 | 85 | 15 | 12 | 6 | 0.2 | DC**0702... | 1.2 |
| JSDNCN1212X07 | 12 | 12 | 120 | 15 | 12 | 6 | 0.2 | DC**0702... | 1.2 |
| JSDNCN1212F11 | 12 | 12 | 85 | 21 | 12 | 6 | 0.2 | DC**11T3... | 1.2 |
| JSDNCN1212H11 | 12 | 12 | 100 | 21 | 12 | 6 | 0.8 | DC**11T3... | 1.2 |
| JSDNCN1212X11 | 12 | 12 | 120 | 21 | 12 | 6 | 0.2 | DC**11T3... | 1.2 |
| JSDNCN1616X11 | 16 | 16 | 120 | 21 | 16 | 8 | 0.2 | DC**11T3... | 1.2 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

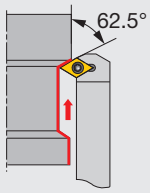
**SPARE PARTS**



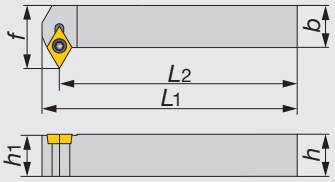

| Designation | Clamping screw | Wrench |
|---|---|---|
| JSDNCN**07 | CSTB-2.5 | T-8F |
| JSDNCN**11 | CSTB-4SD | T-8F |

# J-SERIES
## JSDN3CR/L

Screw-on toolholder with 62.5° approach angle (N3-style) for positive 55° rhombic inserts




Cutting edge style **N3**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| JSDN3CR1212H07 | 12 | 12 | 105 | 100 | 12 | 18 | 0.4 | DC**0702... | 1.2 |
| JSDN3CR1616H11 | 16 | 16 | 107 | 100 | 16 | 25 | 0.8 | DC**11T3... | 1.2 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

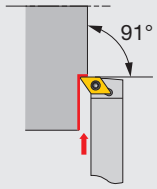



| Designation | Clamping screw | Wrench |
|---|---|---|
| JSDN3CR1212H07 | CSTB-2.5 | T-8F |
| JSDN3CR1616H11 | CSTB-4SD | T-8F |

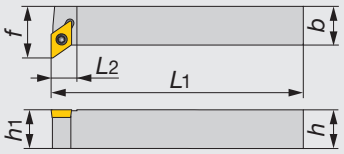
JSDNCN, JSDN3CR/L: Inserts → **B114 -**, CBN → **B168 -**, PCD → **B177**

# J-SERIES
## JSDFCR/L

Screw-on toolholder for facing with 91° approach angle for positive 55° rhombic inserts




Cutting edge style **F**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| JSDFCR/L1212H07 | 12 | 12 | 100 | 8 | 12 | 16 | 0.4 | DC**0702... | 1.2 |
| JSDFCR/L1616H11 | 16 | 16 | 100 | 10.5 | 16 | 22 | 0.8 | DC**11T3... | 1.2 |

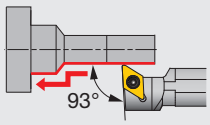
*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| JSDFCR/L1212H07 | CSTB-2.5 | T-8F |
| JSDFCR/L1616H11 | CSTB-4SD | T-8F |

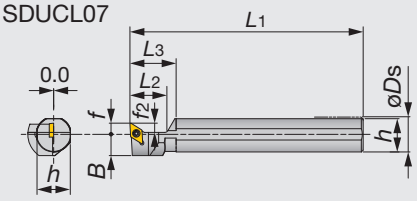
# J-SERIES
## JS-SDUCL

Screw-on toolholder with 93° approach angle for positive 55° rhombic inserts

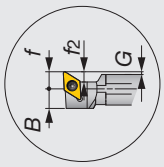



Cutting edge style **U**

SDUCL07




SDUCL11




Left hand (L) shown.

| Designation | ø*D*s | *f* | *f*2 | *L*1 | *L*2 | *L*3 | *h* | B | G | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JS19K-SDUCL07 | 19.05 | 6 | 5 | 125 | 20 | 25 | 18 | 11.5 | - | 0.4 | DC**0702... | 1.2 |
| JS20K-SDUCL07 | 20 | 6 | 5 | 125 | 20 | 25 | 19 | 11.5 | - | 0.4 | DC**0702... | 1.2 |
| JS22K-SDUCL07 | 22 | 6 | 5 | 125 | 20 | 25 | 21 | 11.5 | - | 0.4 | DC**0702... | 1.2 |
| JS19K-SDUCL11 | 19.05 | 10 | 6 | 125 | 20 | 25 | 18 | 11.5 | 1.525 | 0.8 | DC**11T3... | 1.2 |
| JS20K-SDUCL11 | 20 | 10 | 6 | 125 | 20 | 25 | 19 | 11.5 | 1 | 0.8 | DC**11T3... | 1.2 |
| JS22K-SDUCL11 | 22 | 11 | 6 | 125 | 20 | 25 | 21 | 11.5 | 1 | 0.8 | DC**11T3... | 1.2 |
| JS25K-SDUCL11 | 25.4 | 12 | 6 | 125 | 20 | 25 | 24 | 12.7 | 0.7 | 0.8 | DC**11T3... | 1.2 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

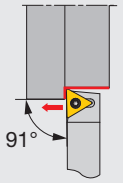
### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| JS**K-SDUCL07 | CSTB-2.5 | T-8F |
| JS**K-SDUCL11 | CSTB-4SD | T-8F |

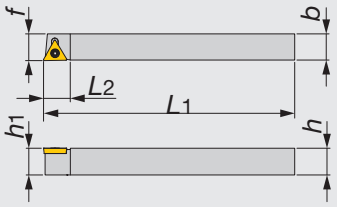
JSDFCR/L, JS-SDUCL: Inserts → **B114 -**, CBN → **B168 -**, PCD → **B177**

# J-SERIES
## JSTACR/L

Screw-on toolholder without offset with 91° approach angle for positive 60° triangle inserts




Cutting edge style **A**




Without offset

Right hand (R) shown.

| Designation | *h* | *b* | $L_1$ | $L_2$ | $h_1$ | *f* | $r_\varepsilon$** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| JSTACR/L0808K08 | 8 | 8 | 125 | 10 | 8 | 8 | 0.2 | TC**0802... | 0.6 |
| JSTACR/L1010K08 | 10 | 10 | 125 | 10 | 10 | 10 | 0.2 | TC**0802... | 0.6 |
| JSTACR/L1212K11 | 12 | 12 | 125 | 12 | 12 | 12 | 0.4 | TC**1102... | 1.2 |
| JSTACR/L1616H11 | 16 | 16 | 100 | 12 | 16 | 16 | 0.4 | TC**1102... | 1.2 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

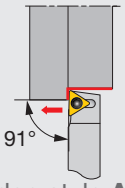
### SPARE PARTS



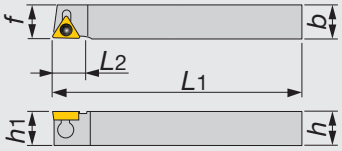

| Designation | Clamping screw | Wrench |
|---|---|---|
| JSTACR/L**K08 | CSTB-2L | T-6F |
| JSTACR/L**11 | CSTB-2.5 | T-8F |

# J-SERIES
## JTTACR/L

Back clamp toolholder without offset with 91° approach angle for positive 60° triangle inserts




Cutting edge style **A**




Without offset

Right hand (R) shown.

| Designation | *h* | *b* | $L_1$ | $L_2$ | $h_1$ | *f* | $r_\varepsilon$** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| JTTACL0810K08 | 8 | 10 | 125 | 10 | 8 | 10 | 0.2 | TC**0802... | 0.9 |
| JTTACR/L1212M11 | 12 | 12 | 150 | 12 | 12 | 12 | 0.4 | TC**1102... | 0.9 |
| JTTACR/L1616M11 | 16 | 16 | 150 | 12 | 16 | 16 | 0.4 | TC**1102... | 0.9 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS



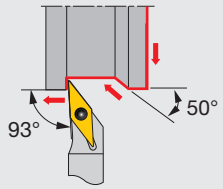


| Designation | Clamp | Clamping screw | Wrench |
|---|---|---|---|
| JTTACL0810K08 | JCP-1 | JDS-3525 | P-2F |
| JTTACR/L**M11 | JCP-2 | JDS-3525 | P-2F |

JSTACR/L, JTTACR/L: Inserts → **B126 -**, PCD → **B177**

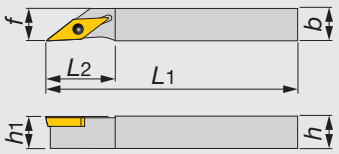
## JSVJ2BR/L

Screw-on toolholder without offset with 93° approach angle for positive 35° rhombic inserts




Cutting edge style **J2**

Without offset




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| JSVJ2BR/L1010X11 | 10 | 10 | 120 | 21 | 10 | 10 | 0.2 | VB**1103... | 1.2 |
| JSVJ2BL1010K11 | 10 | 10 | 125 | 21 | 10 | 10 | 0.2 | VB**1103... | 1.2 |
| JSVJ2BR/L1212F11 | 12 | 12 | 85 | 21 | 12 | 12 | 0.2 | VB**1103... | 1.2 |
| JSVJ2BR/L1212X11 | 12 | 12 | 120 | 21 | 12 | 12 | 0.2 | VB**1103... | 1.2 |
| JSVJ2BR1212K11 | 12 | 12 | 125 | 21 | 12 | 12 | 0.2 | VB**1103... | 1.2 |
| JSVJ2BR/L1616X11 | 16 | 16 | 120 | 21 | 16 | 16 | 0.2 | VB**1103... | 1.2 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

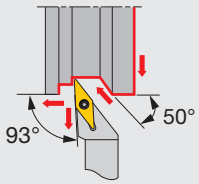
### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| JSVJ2BR/L... | CSTB-2.5 | T-8F |

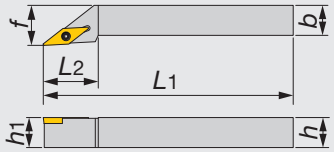


## JSVJBR/L

Screw-on toolholder with 93° approach angle for positive 35° rhombic inserts




Cutting edge style **J**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| JSVJBR/L1010H11 | 10 | 10 | 100 | 20 | 10 | 12 | 0.4 | VB**1103... | 1.2 |
| JSVJBR/L1212H11 | 12 | 12 | 100 | 22 | 12 | 16 | 0.4 | VB**1103... | 1.2 |
| JSVJBR/L1616H11 | 16 | 16 | 100 | 22 | 16 | 20 | 0.4 | VB**1103... | 1.2 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

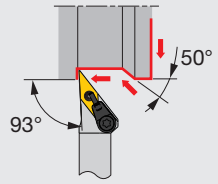
| Designation | Clamping screw | Wrench |
|---|---|---|
| JSVJBR/L... | CSTB-2.5 | T-8F |

JSVJ2BR/L, JSVJBR/L: Inserts → **B142 -**, CBN → **B169 -**

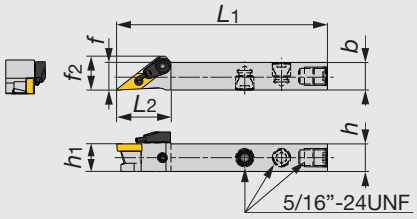
# J-SERIES

## JSVJ2BR/L-CHP

Screw-on toolholder without offset with 93° approach angle for positive 35° rhombic inserts, with channels for high pressure coolant




Cutting edge style **J2**




Without offset

Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *f*2 | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| JSVJ2BR/L1212F11-CHP | 12 | 12 | 85 | 23.6 | 12 | 12 | 14.7 | 0.2 | VB**1103... | 1.2 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

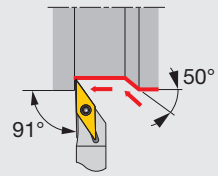
### SPARE PARTS

| Designation | Clamping screw | Coolant unit | Wrench |
|---|---|---|---|
| JSVJ2BR/L1212F11-CHP | CSTB-2.5 | S-CU-CHP | T-8F |

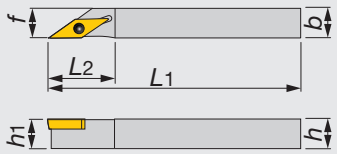
# J-SERIES

## JSVABR/L

Screw-on toolholder without offset with 91° approach angle for positive 35° rhombic inserts




Cutting edge style **A**




Without offset

Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| JSVABR/L1010K11 | 10 | 10 | 125 | 21 | 10 | 10 | 0.2 | VB**1103... | 1.2 |
| JSVABL1212K11 | 12 | 12 | 125 | 21 | 12 | 12 | 0.2 | VB**1103... | 1.2 |
| JSVABL1616K11 | 16 | 16 | 125 | 21 | 16 | 16 | 0.2 | VB**1103... | 1.2 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

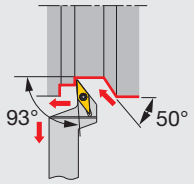
### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| JSVABR/L... | CSTB-2.5 | T-8F |

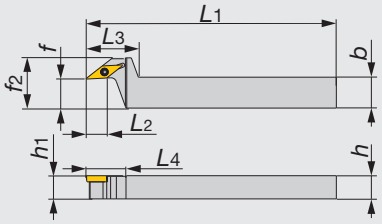
JSVJ2BR/L-CHP, JSVABR/L: Inserts → **B142 -**, CBN → **B169 -**

# JSVJBR-F

## Screw-on stepped-head toolholder with 93° approach angle for positive 35° rhombic inserts




Cutting edge style **J**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *L*3 | *L*4 | *h*1 | *f* | *f*2 | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JSVJBR1216F11-F15 | 12 | 16 | 85 | 12.6 | 27 | 21 | 12 | 15 | 26 | 0.2 | VB**1103... | 1.2 |
| JSVJBR1216X11-F15 | 12 | 16 | 120 | 12.6 | 27 | 21 | 12 | 15 | 26 | 0.2 | VB**1103... | 1.2 |
| JSVJBR1620X11-F15 | 16 | 20 | 120 | 12.6 | 27 | 21 | 16 | 15 | 26 | 0.2 | VB**1103... | 1.2 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS



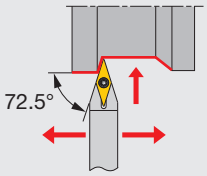

| Designation | Clamping screw | Wrench |
|---|---|---|
| JSVJBR**-F15 | CSTB-2.5 | T-8F |

JSVJBR-F: Inserts → **B142 -**, CBN → **B169 -**

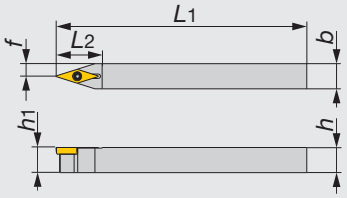
# JSVNBN

Screw-on toolholder with 72.5° approach angle for positive 35° rhombic inserts






Cutting edge style **N**




| Designation | *h* | *b* | $L_1$ | $L_2$ | $h_1$ | *f* | $r_\varepsilon$** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| JSVNBN1010X11 | 10 | 10 | 120 | 22 | 10 | 5 | 0.2 | VB**1103... | 1.2 |
| JSVNBN1212F11 | 12 | 12 | 85 | 22 | 12 | 6 | 0.2 | VB**1103... | 1.2 |
| JSVNBN1212X11 | 12 | 12 | 120 | 22 | 12 | 6 | 0.2 | VB**1103... | 1.2 |
| JSVNBN1616X11 | 16 | 16 | 120 | 22 | 16 | 8 | 0.2 | VB**1103... | 1.2 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

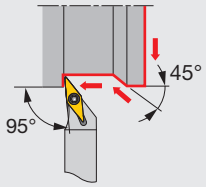
## SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| JSVNBN... | CSTB-2.5 | T-8F |

JSVNBN: Inserts → **B142 -**, CBN → **B169 -**

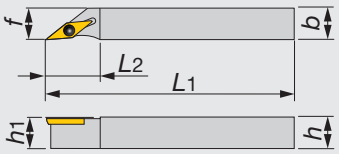
## JSVL2PR/L

Screw-on toolholder without offset with 95° approach angle for positive 35° rhombic inserts




Cutting edge style **L2**

Without offset




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| JSVL2PR/L1010X08 | 10 | 10 | 120 | 16 | 10 | 10 | 0.2 | VP**0802... | 0.6 |
| JSVL2PR/L1010K08 | 10 | 10 | 125 | 16 | 10 | 10 | 0.2 | VP**0802... | 0.6 |
| JSVL2PR/L1212F08 | 12 | 12 | 85 | 16 | 12 | 12 | 0.2 | VP**0802... | 0.6 |
| JSVL2PR/L1212F11 | 12 | 12 | 85 | 21 | 12 | 12 | 0.2 | VP**1103... | 1.2 |
| JSVL2PR/L1212X08 | 12 | 12 | 120 | 16 | 12 | 12 | 0.2 | VP**0802... | 0.6 |
| JSVL2PR/L1212X11 | 12 | 12 | 120 | 21 | 12 | 12 | 0.2 | VP**1103... | 1.2 |
| JSVL2PR/L1212K08 | 12 | 12 | 125 | 16 | 12 | 12 | 0.2 | VP**0802... | 0.6 |
| JSVL2PR/L1616X08 | 16 | 16 | 120 | 16 | 16 | 16 | 0.2 | VP**0802... | 0.6 |
| JSVL2PL1616K08 | 16 | 16 | 125 | 16 | 16 | 16 | 0.2 | VP**0802... | 0.6 |
| JSVL2PR/L1616X11 | 16 | 16 | 120 | 21 | 16 | 16 | 0.2 | VP**1103... | 1.2 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

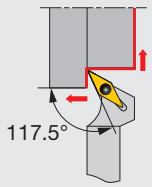



| Designation | Clamping screw | Wrench |
|---|---|---|
| JSVL2PR/L**08 | CSTB-2L | T-6F |
| JSVL2PR/L**11 | CSTB-2.5 | T-8F |



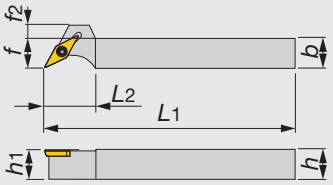
## JSVP2PR/L

Screw-on toolholder without offset with 117.5° approach angle for positive 35° rhombic inserts




Cutting edge style **P2**

Without offset




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *f*2 | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| JSVP2PR/L1010K08 | 10 | 10 | 125 | 16 | 10 | 10 | 4 | 0.2 | VP**0802... | 0.6 |
| JSVP2PR/L1010K11 | 10 | 10 | 125 | 20 | 10 | 10 | 8 | 0.2 | VP**1103... | 1.2 |
| JSVP2PR/L1212K08 | 12 | 12 | 125 | 16 | 12 | 12 | 2 | 0.2 | VP**0802... | 0.6 |
| JSVP2PR/L1212K11 | 12 | 12 | 125 | 20 | 12 | 12 | 6 | 0.2 | VP**1103... | 1.2 |
| JSVP2PR/L1616K08 | 16 | 16 | 125 | 16 | 16 | 16 | 2 | 0.2 | VP**0802... | 0.6 |
| JSVP2PR/L1616K11 | 16 | 16 | 125 | 20 | 16 | 16 | 6 | 0.2 | VP**1103... | 1.2 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

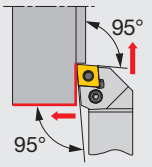



| Designation | Clamping screw | Wrench |
|---|---|---|
| JSVP2PR/L**08 | CSTB-2L | T-6F |
| JSVP2PR/L**11 | CSTB-2.5 | T-8F |

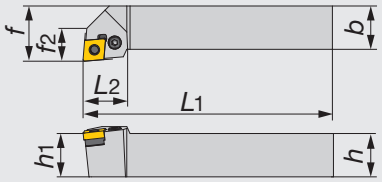
JSVL2PR/L, JSVP2PR/L: Inserts → **B147**

## PCLNR

Lever lock type toolholder with 95° approach angle for negative 80° rhombic inserts




Cutting edge style **L**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *f*2 | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| PCLNR2020H12 | 20 | 20 | 100 | 26 | 20 | 25 | 18 | 0.8 | CN**1204... | 3 |

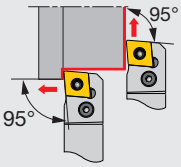
*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

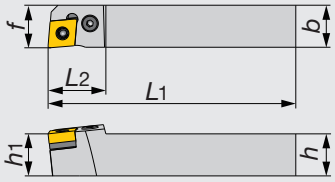
| Designation | Shim | Clamping screw | Lever | Spring pin | Wrench |
|---|---|---|---|---|---|
| PCLNR2020H12 | LSC42 | LCS4 | LCL4 | LSP4 | P-3 |

## PCL2NR

Lever lock type toolholder without offset with 95° approach angle for negative 80° rhombic inserts




Cutting edge style **L2**




Without offset

Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| PCL2NR2020H12 | 20 | 20 | 100 | 26 | 20 | 20 | 0.8 | CN**1204... | 3 |

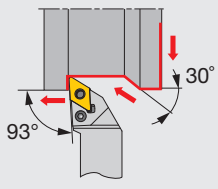
*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

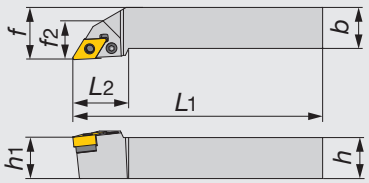
| Designation | Shim | Clamping screw | Lever | Spring pin | Wrench |
|---|---|---|---|---|---|
| PCL2NR2020H12 | LSC42 | LCS4 | LCL4 | LSP4 | P-3 |

## PDJNR

Lever lock type toolholder with 93° approach angle for negative 55° rhombic inserts




Cutting edge style **J**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *f*2 | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| PDJNR2020H15 | 20 | 20 | 100 | 32 | 20 | 25 | 20 | 0.8 | DN**1504... | 3 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

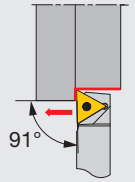
| Designation | Shim | Clamping screw | Lever | Spring pin | Wrench |
|---|---|---|---|---|---|
| PDJNR2020H15 | LSD42 | LCS4 | LCL4 | LSP4 | P-3 |

PCLNR, PCL2NR: Inserts → **B050 -**

PDJNR: Inserts → **B061 -**

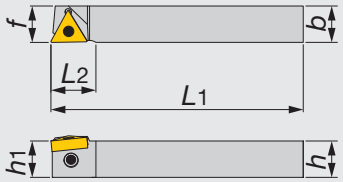
# J-SERIES
## JTTANR/L

Back clamp toolholder without offset with 91° approach angle for negative 60° triangular inserts




Cutting edge style **A**

Without offset




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| JTTANR/L1216K16 | 12 | 16 | 125 | 19.8 | 12 | 16 | 0.4 | TN**1604... | 1.2 |
| JTTANR/L1616K16 | 16 | 16 | 125 | 19.8 | 16 | 16 | 0.4 | TN**1604... | 1.2 |

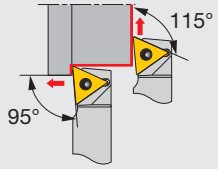
*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

| Designation | Clamp | Clamping screw | Wrench |
|---|---|---|---|
| JTTANR/L... | JCP-3N | JDS-5040 | P-2.5F |

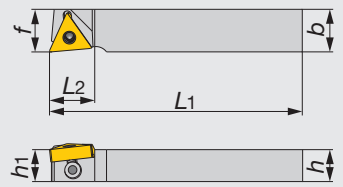
# J-SERIES
## JTTLNR/L

Back clamp toolholder without offset with 95° approach angle for negative 60° triangular inserts




Cutting edge style **L**

Without offset




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| JTTLNR/L1216F16 | 12 | 16 | 85 | 17 | 12 | 16 | 0.4 | TN**1604... | 1 |
| JTTLNR/L1216X16 | 12 | 16 | 120 | 17 | 12 | 16 | 0.4 | TN**1604... | 1 |
| JTTLNR/L1616X16 | 16 | 16 | 120 | 17 | 16 | 16 | 0.4 | TN**1604... | 1 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

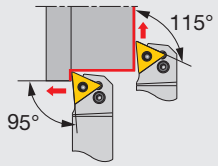
### SPARE PARTS

| Designation | Clamp | Clamping screw | Wrench |
|---|---|---|---|
| JTTLNR/L... | JCP-3N | JDS-5040 | P-2.5F |

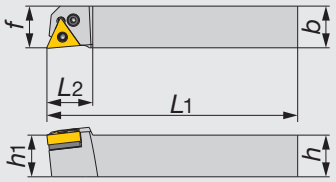
JTTANR/L, JTTLNR/L: Inserts → **B079 -**, CBN → **B164 -**, PCD → **B176 -**

## PTL2NR/L

Lever lock type toolholder without offset with 95° approach angle for negative 60° triangular inserts




Cutting edge style **L2**




Without offset

Right hand (R) shown.

| Designation | *h* | *b* | $L_1$ | $L_2$ | $h_1$ | *f* | $r_\varepsilon$** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| PTL2NR/L2020H16 | 20 | 20 | 100 | 22 | 20 | 20 | 0.4 | TN**1604... | 2 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

| Designation | Shim | Clamping screw | Lever | Spring pin | Wrench |
|---|---|---|---|---|---|
| PTL2NR/L2020H16 | LST317 | LCS3 | LCL3 | LSP3 | P-2.5 |

## PARTS FOR COOLANT HOSE

### Connecting hose

Fig. 1

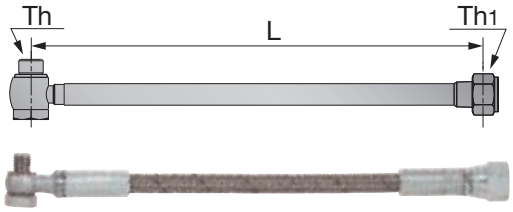
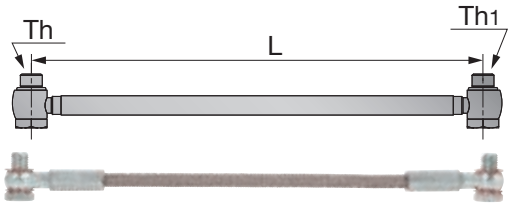
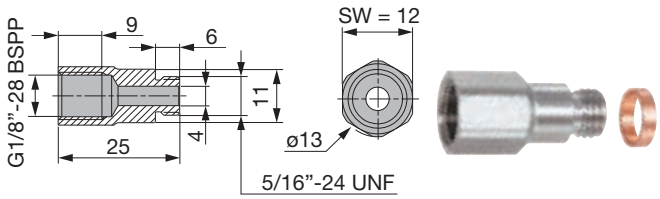



Fig. 2



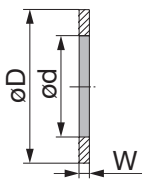

| Designation | L | Th | Th1 | Max. pressure (Mpa) | Fig. |
|---|---|---|---|---|---|
| CHP-HOSE-G1/8-7/16-200BS | 200 | G1/8"-28 BSPP | 7/16"-20 UNF | 26 | 1 |
| CHP-HOSE-G1/8-7/16-250BS | 250 | G1/8"-28 BSPP | 7/16"-20 UNF | 26 | 1 |
| CHP-HOSE-5/16-7/16-200BS | 200 | 5/16"-24UNF | 7/16"-20 UNF | 20 | 1 |
| CHP-HOSE-5/16-G1/8-200BS | 200 | 5/16"-24UNF | G1/8"-28 BSPP | 20 | 1 |
| CHP-HOSE-G1/8-G1/8-200BB | 200 | G1/8"-28 BSPP | G1/8"-28 BSPP | 26 | 2 |
| CHP-HOSE-G1/8-G1/8-250BB | 250 | G1/8"-28 BSPP | G1/8"-28 BSPP | 26 | 2 |

### Connector for small lathe with seal washer




| Designation |
|---|
| CHP-CONECTOR/5/16-G1/8 |

### Seal washer



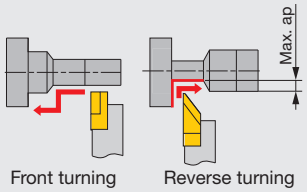


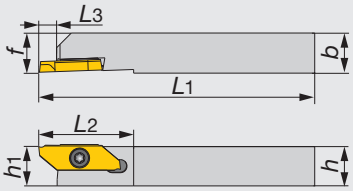

| Designation | øD | ød | W |
|---|---|---|---|
| CHP-COPPER-SEAL1/8 | 15 | 10 | 1 |
| CHP-COPPER-SEAL5/16 | 11 | 8 | 1 |
| CHP-COPPER-SEAL5/16-2.5 | 11 | 8 | 2.5 |

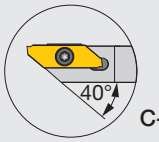
PTL2NR/L: Inserts → **B079 -**, CBN → **B164 -**, PCD → **B176 -**

# JSXGR/L

Screw-on toolholder without offset for front / reverse turning & external grooving




Without offset

C-type

Right hand (R) shown.

| Designation | h | b | L1 | L2 | L3 | h1 | f | Insert |
|---|---|---|---|---|---|---|---|---|
| JSXGR/L1010K8-C | 10 | 10 | 125 | 29 | 6.7 | 10 | 10 | JXFR/L8..., JXRR/L8... |
| JSXGR/L1212K8-C | 12 | 12 | 125 | 29 | 6.7 | 12 | 12 | JXFR/L8..., JXRR/L8... |
| JSXGR/L1616K8 | 16 | 16 | 125 | 29 | 6.5 | 16 | 16 | JXFR/L8..., JXRR/L8... |
| JSXGR/L2020K8 | 20 | 20 | 125 | 29 | 6.5 | 20 | 20 | JXFR/L8..., JXRR/L8... |
| JSXGR/L2525K8 | 25 | 25 | 125 | 29 | 6.5 | 25 | 25 | JXFR/L8..., JXRR/L8... |

- Can be wrenched also from the back with a double-head screw.
- This toolholders can be used for JXF insert (front-turning), JXR insert (reverse-turning), JXG insert (grooving)

## SPARE PARTS

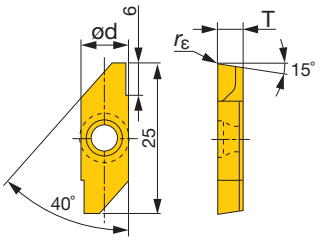
| Designation | Clamping screw | Wrench | Wrench 1 |
|---|---|---|---|
| JSXGR/L... | CSTB-4SD | T-8F | (T-8L) |

*Optional

## INSERT

### JXF (front turning, sharp edge)





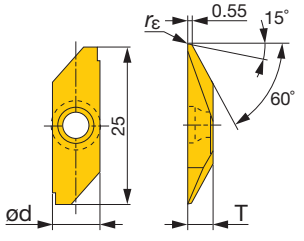

Right hand (R) shown.

| Designation | rε | Coating J740 R | Coating J740 L | Uncoated TH10 R | Uncoated TH10 L | ød | T | Max. depth of cut |
|---|---|---|---|---|---|---|---|---|
| JXFR/L8000F | 0.03 | ● | | ● | | 8 | 3.97 | 5.5 |
| JXFR/L8010F | 0.1 | ● | | ● | | 8 | 3.97 | 5.5 |

● : Line-up

### JXR (reverse turning, sharp edge)






Right hand (R) shown.

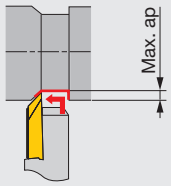
| Designation | rε | Coating J740 R | Coating J740 L | Uncoated TH10 R | Uncoated TH10 L | ød | T | Max. depth of cut |
|---|---|---|---|---|---|---|---|---|
| JXRR/L8000F | 0.03 | ● | | ● | | 8 | 3.97 | 5.5 |
| JXRR/L8010F | 0.1 | ● | | ● | | 8 | 3.97 | 5.5 |

● : Line-up

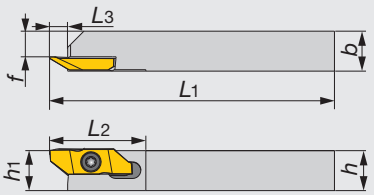
# JSXBR/L

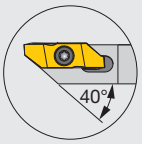
## Screw-on toolholder for back turning and threading






Max. ap = 5.5 mm




C-type

Right hand (R) shown.

| Designation | *h* | *b* | $L_1$ | $L_2$ | $L_3$ | $h_1$ | *f* | Insert |
|---|---|---|---|---|---|---|---|---|
| JSXBR/L1010K8-C | 10 | 10 | 125 | 29 | 6.7 | 10 | 5.7 | JXBR/L8..., JXT*R... |
| JSXBR/L1212K8-C | 12 | 12 | 125 | 29 | 6.7 | 12 | 7.7 | JXBR/L8..., JXT*R... |
| JSXBR/L1616K8 | 16 | 16 | 125 | 29 | 6.4 | 16 | 11.7 | JXBR/L8..., JXT*R... |
| JSXBR/L2020K8 | 20 | 20 | 125 | 29 | 6.4 | 20 | 15.7 | JXBR/L8..., JXT*R... |
| JSXBR/L2525K8 | 25 | 25 | 125 | 29 | 6.4 | 25 | 20.7 | JXBR/L8..., JXT*R... |

- Can be wrenched also from the back with a double-head screw.
- This toolholders can be used for JXB insert (back-turning), JXT insert (threading)

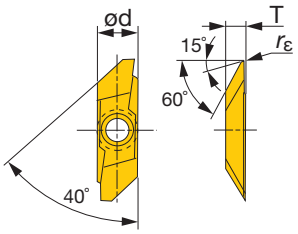
### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| JSXBR/L... | CSTB-4SD | T-8F |

## INSERT

### JXB (sharp edge)





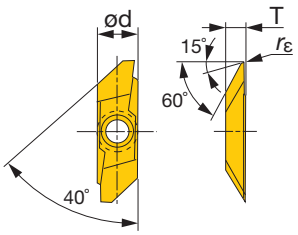

Right hand (R) shown.

| Designation | rε | Coating J740 R | Coating J740 L | Uncoated TH10 R | Uncoated TH10 L | ød | T | Max. depth of cut |
|---|---|---|---|---|---|---|---|---|
| JXBR/L8000F | 0.03 | ● | ● | ● | ● | 8 | 3.97 | 5.5 |
| JXBR/L8005F | 0.05 | ● | ● | ● | ● | 8 | 3.97 | 5.5 |
| JXBR/L8010F | 0.1 | ● | ● | ● | ● | 8 | 3.97 | 5.5 |
| JXBR/L8015F | 0.15 | ● | ● | ● | ● | 8 | 3.97 | 5.5 |

● : Line-up

### JXB (with horning)



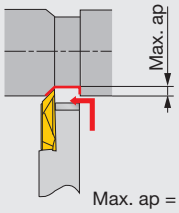


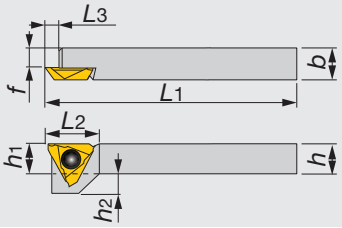

Right hand (R) shown.

| Designation | rε | Coating J740 R | Coating J740 L | ød | T | Max. depth of cut |
|---|---|---|---|---|---|---|
| JXBR/L8005 | 0.05 | ● | ● | 8 | 3.97 | 5.5 |
| JXBR/L8010 | 0.1 | ● | ● | 8 | 3.97 | 5.5 |
| JXBR/L8015 | 0.15 | ● | ● | 8 | 3.97 | 5.5 |

● : Line-up

# J-SERIES
## JSTBR/L
Screw-on toolholder for back turning




Right hand (R) shown.

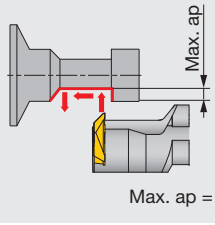
| Designation | *h* | *b* | *L*1 | *L*2 | *L*3 | *h*1 | *f* | *h*2 | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| JSTBR/L1010X3 | 10 | 10 | 120 | 15 | 5 | 10 | 6 | 5 | JTBR/L3... | 1.2 |
| JSTBL1010K3 | 10 | 10 | 125 | 15 | 5 | 10 | 6 | 5 | JTBR/L3... | 1.2 |
| JSTBR/L1212F3 | 12 | 12 | 85 | 15 | 5 | 12 | 8 | 3 | JTBR/L3... | 1.2 |
| JSTBR/L1212X3 | 12 | 12 | 120 | 15 | 5 | 12 | 8 | 3 | JTBR/L3... | 1.2 |
| JSTBR/L1616X3 | 16 | 16 | 120 | 15 | 5 | 16 | 12 | - | JTBR/L3... | 1.2 |

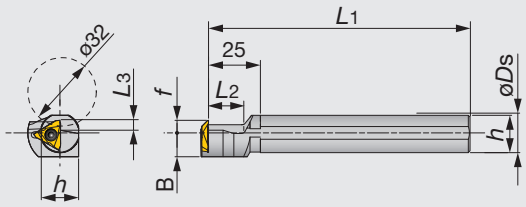
*Torque: Recommended torque (N·m) for clamping

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| JSTBR/L... | CSTB-4SD | T-8F |

# J-SERIES
## JS-TBL3
Screw-on toolholder for back turning




| Designation | ø*D*s | *f* | *L*1 | *L*2 | *L*3 | *h* | B | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| JS19K-TBL3 | 19.05 | 6 | 125 | 17 | 4.5 | 18 | 11.5 | JTBR3... | 3 |
| JS20K-TBL3 | 20 | 6 | 125 | 17 | 4.5 | 19 | 11.5 | JTBR3... | 3 |
| JS22K-TBL3 | 22 | 6 | 125 | 17 | 4.5 | 21 | 11.5 | JTBR3... | 3 |
| JS25K-TBL3 | 25.4 | 10 | 125 | 17 | 4.5 | 24 | 12.7 | JTBR3... | 3 |

*Torque: Recommended torque (N·m) for clamping

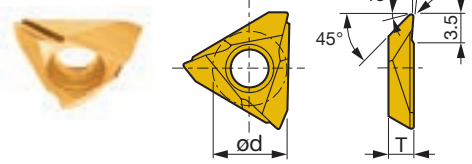
### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| JS**-TBL3 | CSTB-4S | T-15F |

JSTBR/L, JS-TBL3: Inserts → **B348**, Standard cutting conditions → **B348**

## INSERT

### JTB (sharp edge)

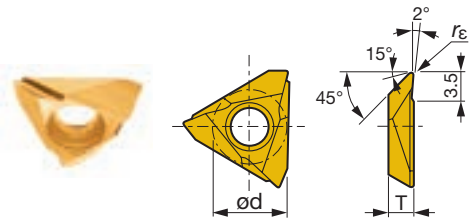



Right hand (R) shown.

| Designation | rε | Coating | | | | Cermet | | Uncoated | | ød | T | Max. depth of cut |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | J740 | | SH725 | | NS9530 | | TH10 | | | | |
| | | R | L | R | L | R | L | R | L | | | |
| JTBR/L3000F | 0.03 | ● | ● | ● | ● | | | ● | ● | 9.438 | 3.18 | 2.5 |
| JTBR/L3005F | 0.05 | ● | ● | ● | ● | | | ● | ● | 9.438 | 3.18 | 2.5 |
| JTBR/L3010F | 0.1 | ● | ● | ● | ● | ● | ● | ● | ● | 9.438 | 3.18 | 2.5 |
| JTBR/L3015F | 0.15 | ● | | ● | ● | | | | | 9.438 | 3.18 | 2.5 |

● : Line-up

### JTB (with horning)




Right hand (R) shown.

| Designation | rε | Coating | | Coated cermet | | ød | T | Max. depth of cut |
|---|---|---|---|---|---|---|---|---|
| | | J740 | | J9530 | | | | |
| | | R | L | R | L | | | |
| JTBR/L3005 | 0.05 | ● | ● | ● | | 9.438 | 3.18 | 2.5 |
| JTBR/L3010 | 0.1 | ● | ● | ● | | 9.438 | 3.18 | 2.5 |

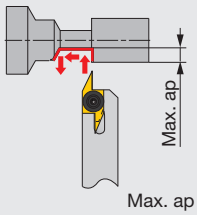
● : Line-up

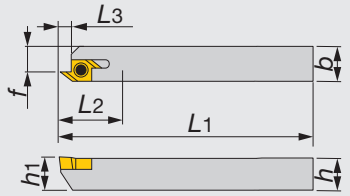
## STANDARD CUTTING CONDITIONS (JTB type insert)

| ISO | Workpiece material | Grade | Cutting speed *Vc* (m/min) | Feed *f* (mm/rev) |
|---|---|---|---|---|
| P | General steel (C45, etc.) | SH725 | 50 - 200 | 0.01 - 0.1 |
| | | J740 | 10 - 100 | 0.01 - 0.1 |
| | | NS9530 | 50 - 150 | 0.01 - 0.1 |
| | | J9530 | 50 - 150 | 0.01 - 0.1 |
| | Free-cutting steel (11SMn28, etc.) | SH725 | 50 - 200 | 0.01 - 0.1 |
| | | J740 | 10 - 100 | 0.01 - 0.1 |
| M | Stainless steel (X10CrNiS18-9, etc.) | SH725 | 50 - 200 | 0.01 - 0.1 |
| | | J740 | 10 - 100 | 0.01 - 0.1 |
| | | NS9530 | 50 - 150 | 0.01 - 0.1 |
| | | J9530 | 50 - 150 | 0.01 - 0.1 |
| N | Aluminium alloys, Brass (Si < 12%, C3604B / CW614N, etc.) | TH10 | 10 - 200 | 0.01 - 0.1 |
| S | Difficult-to-machine material, Titanium alloys (Ti-6Al-4V, etc.) | TH10 | 10 - 30 | 0.01 - 0.1 |

# JSEGR/L

Screw-on toolholder for back turning




| Designation | *h* | *b* | $L_1$ | $L_2$ | $L_3$ | $h_1$ | *f* | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| JSEGR/L1010K10 | 10 | 10 | 125 | - | 3.3 | 10 | 7.5 | J10ER/L... | 1.2 |
| JSEGR/L1212K10 | 12 | 12 | 125 | - | 3.3 | 12 | 9.5 | J10ER/L... | 1.2 |
| JSEGR/L1616K10 | 16 | 16 | 125 | - | 3.3 | 16 | 13.5 | J10ER/L... | 1.2 |

*Torque: Recommended torque (N·m) for clamping

## SPARE PARTS



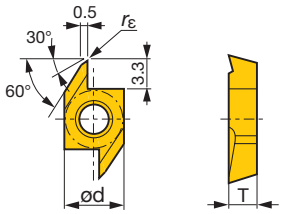


| Designation | Clamping screw | Wrench |
|---|---|---|
| JSEGR/L... | CSTB-2.5 | T-8F |

## INSERT

### J10E (sharp edge)





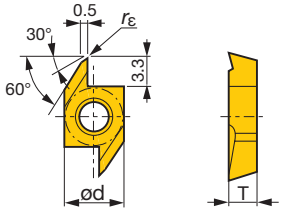

Right hand (R) shown.

| Designation | rε | Coating | | | | Cermet | | Uncoated | | ød | T | Max. depth of cut |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | J740 | | SH725 | | NS9530 | | TH10 | | | | |
| | | R | L | R | L | R | L | R | L | | | |
| J10ER/L005BF | 0.05 | ● | ● | ● | ● | ● | | ● | ● | 6.35 | 3.18 | 3 |
| J10ER/L010BF | 0.1 | ● | ● | ● | ● | ● | | ● | ● | 6.35 | 3.18 | 3 |
| J10ER/L015BF | 0.15 | | | ● | ● | | | | | 6.35 | 3.18 | 3 |

● : Line-up

### J10E (with horning)






Right hand (R) shown.

| Designation | rε | Coating | | Coated cermet | | ød | T | Max. depth of cut |
|---|---|---|---|---|---|---|---|---|
| | | J740 | | J9530 | | | | |
| | | R | L | R | L | | | |
| J10ER/L005B | 0.05 | ● | ● | ● | | 6.35 | 3.18 | 3 |
| J10ER/L010B | 0.1 | ● | ● | ● | | 6.35 | 3.18 | 3 |

● : Line-up

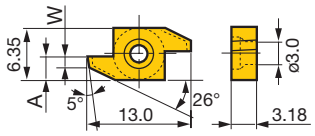
JSEGR/L: Inserts → **B349 -**, Standard cutting conditions → **B350**

## STANDARD CUTTING CONDITIONS (J10E type insert)

| ISO | Workpiece material | Grade | Cutting speed *Vc* (m/min) | Feed *f* (mm/rev) |
|---|---|---|---|---|
| P | General steel (C45, etc.) | SH725 | 50 - 200 | 0.01 - 0.1 |
| | | J740 | 10 - 100 | 0.01 - 0.1 |
| | | NS9530 | 50 - 150 | 0.01 - 0.1 |
| | | J9530 | 50 - 150 | 0.01 - 0.1 |
| | Free-cutting steel (11SMn28, etc.) | SH725 | 50 - 200 | 0.01 - 0.1 |
| | | J740 | 10 - 100 | 0.01 - 0.1 |
| M | Stainless steel (X10CrNiS18-9, etc.) | SH725 | 50 - 200 | 0.01 - 0.1 |
| | | J740 | 10 - 100 | 0.01 - 0.1 |
| | | NS9530 | 50 - 150 | 0.01 - 0.1 |
| | | J9530 | 50 - 150 | 0.01 - 0.1 |
| N | Aluminium alloys, Brass (Si < 12%, C3604B / CW614N, etc.) | TH10 | 10 - 200 | 0.01 - 0.1 |
| S | Difficult-to-machine material, Titanium alloys (Ti-6Al-4V, etc.) | TH10 | 10 - 30 | 0.01 - 0.1 |

## INSERT

### 10E (Insert blank)



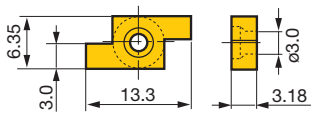

Right hand (R) shown.

| Designation | Uncoated TH10 R | Uncoated TH10 L | W | A |
|---|---|---|---|---|
| 10ER/L100B | ● | ● | 1 | 2.5 |
| 10ER/L150B | ● | ● | 1.5 | 3 |

● : Line-up

Note: Right hand holder (JSEGR...) use right hand insert (10ER...) and left hand holder (JSEGL...) use left hand insert (10EL...).

### 10E (Insert blank)



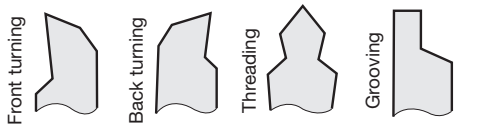

Right hand (R) shown.

| Designation | Uncoated TH10 R | Uncoated TH10 L |
|---|---|---|
| 10ER/L300 | ● | ● |

● : Line-up

Note: Right hand holder (JSEGR...) use right hand insert (10ER...) and left hand holder (JSEGL...) use left hand insert (10EL...).

## Formed examples of insert blanks




Notes:
- Front relief angle, side relief angle, edge width can be ground depending on the application.
- Insert blanks can be formed to a profiling tool which has a width up to 3 mm.

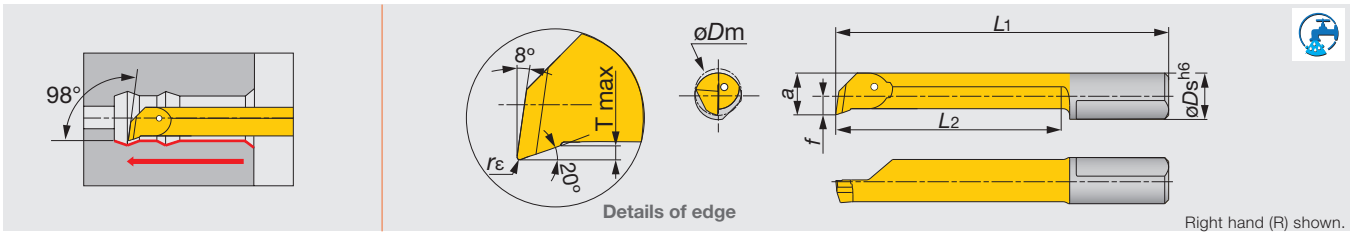
## Standard cutting conditions

| Operations | Workpiece material | | Carbon steels | Stainless steels | Brass |
|---|---|---|---|---|---|
| Lateral feed (external turning) | Cutting speed (m/min) | | ~ 100 | ~ 50 | ~ 200 |
| | Feed (mm/rev) | Roughing | ~ 0.06 | ~ 0.03 | ~ 0.1 |
| | | Medium | ~ 0.03 | ~ 0.025 | ~ 0.06 |
| | | Finishing | ~ 0.02 | ~ 0.015 | ~ 0.04 |
| Parting-off Grooving Forming | Cutting speed (m/min) | | ~ 80 | ~ 30 | ~ 150 |
| | Feed (mm/rev) | Roughing | ~ 0.02 | ~ 0.015 | ~ 0.05 |
| | | Medium | ~ 0.015 | ~ 0.01 | ~ 0.03 |
| | | Finishing | ~ 0.01 | ~ 0.008 | ~ 0.015 |

MEMO

Solid boring bars for boring, profiling & chamfering



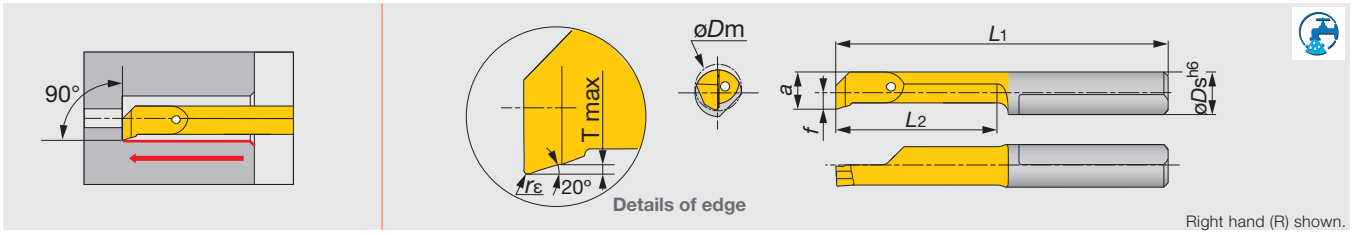



| Designation | SH730 | øDm | øDs | f | a | L1 | L2 | T max | rε +0.05 0 |
|---|---|---|---|---|---|---|---|---|---|
| JBTR04020004-D006 | ● | 0.6 | 4 | - | 0.5 | 18.5 | 2 | 0.08 | 0.04 |
| JBTR04030004-D006 | ● | 0.6 | 4 | - | 0.5 | 19.5 | 3 | 0.08 | 0.04 |
| JBTR04045005-D010 | ● | 1 | 4 | - | 0.9 | 21 | 4.5 | 0.1 | 0.05 |
| JBTR04065005-D010 | ● | 1 | 4 | - | 0.9 | 23 | 6.5 | 0.1 | 0.05 |
| JBTR04040005-D020 | ● | 2 | 4 | - | 1.7 | 20.5 | 4 | 0.1 | 0.05 |
| JBTR04090005-D020 | ● | 2 | 4 | - | 1.7 | 25.5 | 9 | 0.1 | 0.05 |
| JBTR04140005-D020 | ● | 2 | 4 | - | 1.7 | 30.5 | 14 | 0.1 | 0.05 |
| JBTR/L04090010-D028 | ● | 2.8 | 4 | 0.6 | 2.6 | 25.5 | 9 | 0.2 | 0.1 |
| JBTR/L04150010-D028 | ● | 2.8 | 4 | 0.6 | 2.6 | 31.5 | 15 | 0.2 | 0.1 |
| JBTR/L04190010-D028 | ● | 2.8 | 4 | 0.6 | 2.6 | 35.5 | 19 | 0.2 | 0.1 |
| JBTR/L04090010-D040 | ● | 4 | 4 | 1.5 | 3.5 | 25.5 | 9 | 0.3 | 0.1 |
| JBTR/L04150010-D040 | ● | 4 | 4 | 1.5 | 3.5 | 31.5 | 15 | 0.3 | 0.1 |
| JBTR/L04190010-D040 | ● | 4 | 4 | 1.5 | 3.5 | 35.5 | 19 | 0.3 | 0.1 |
| JBTR04230010-D040 | ● | 4 | 4 | 1.5 | 3.5 | 39.5 | 23 | 0.3 | 0.1 |
| JBTR04270010-D040 | ● | 4 | 4 | 1.5 | 3.5 | 43.5 | 27 | 0.3 | 0.1 |
| JBTR/L07090015-D050 | ● | 5 | 7 | 0.9 | 4.4 | 25 | 9 | 0.5 | 0.15 |
| JBTR/L07140015-D050 | ● | 5 | 7 | 0.9 | 4.4 | 30 | 14 | 0.5 | 0.15 |
| JBTR/L07190015-D050 | ● | 5 | 7 | 0.9 | 4.4 | 35 | 19 | 0.5 | 0.15 |
| JBTR/L07240015-D050 | ● | 5 | 7 | 0.9 | 4.4 | 40 | 24 | 0.5 | 0.15 |
| JBTR/L07290015-D050 | ● | 5 | 7 | 0.9 | 4.4 | 45 | 29 | 0.5 | 0.15 |
| JBTR07340015-D050 | ● | 5 | 7 | 0.9 | 4.4 | 50 | 34 | 0.5 | 0.15 |
| JBTR/L07140015-D060 | ● | 6 | 7 | 1.8 | 5.3 | 30 | 14 | 0.5 | 0.15 |
| JBTR/L07210015-D060 | ● | 6 | 7 | 1.8 | 5.3 | 37 | 21 | 0.5 | 0.15 |
| JBTR/L07240015-D060 | ● | 6 | 7 | 1.8 | 5.3 | 40 | 24 | 0.5 | 0.15 |
| JBTR/L07290015-D060 | ● | 6 | 7 | 1.8 | 5.3 | 45 | 29 | 0.5 | 0.15 |
| JBTR07340015-D060 | ● | 6 | 7 | 1.8 | 5.3 | 50 | 34 | 0.5 | 0.15 |
| JBTR07410015-D060 | ● | 6 | 7 | 1.8 | 5.3 | 57 | 41 | 0.5 | 0.15 |
| JBTR/L07190015-D068 | ● | 6.8 | 7 | 2.8 | 6.3 | 35 | 19 | 0.6 | 0.15 |
| JBTR07240015-D068 | ● | 6.8 | 7 | 2.8 | 6.3 | 40 | 24 | 0.6 | 0.15 |
| JBTR/L07290015-D068 | ● | 6.8 | 7 | 2.8 | 6.3 | 45 | 29 | 0.6 | 0.15 |
| JBTR/L07340015-D070 | ● | 7 | 7 | 2.8 | 6.3 | 50 | 34 | 0.6 | 0.15 |
| JBTR07390015-D070 | ● | 7 | 7 | 2.8 | 6.3 | 55 | 39 | 0.6 | 0.15 |
| JBTR07440015-D070 | ● | 7 | 7 | 2.8 | 6.3 | 60 | 44 | 0.6 | 0.15 |
| JBTR07490015-D070 | ● | 7 | 7 | 2.8 | 6.3 | 65 | 49 | 0.6 | 0.15 |

● : Line-up

Standard cutting conditions → **B359**

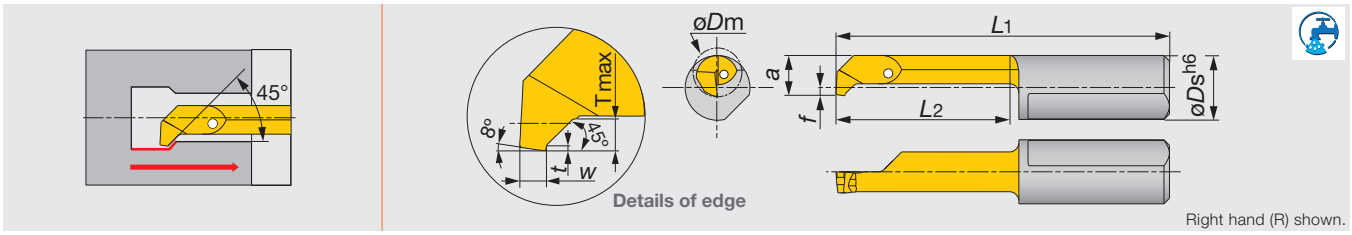
## TINY MTURN
### JBP R
Solid boring bars for boring & chamfering




| Designation | SH730 | øDm | øDs | f | a | L1 | L2 | T max | rε +0.05 0 |
|---|---|---|---|---|---|---|---|---|---|
| JBPR04090010-D028 | ● | 2.8 | 4 | 0.6 | 2.6 | 25.5 | 9 | 0.2 | 0.1 |
| JBPR04150010-D028 | ● | 2.8 | 4 | 0.6 | 2.6 | 31.5 | 15 | 0.2 | 0.1 |
| JBPR04090010-D040 | ● | 4 | 4 | 1.5 | 3.5 | 25.5 | 9 | 0.3 | 0.1 |
| JBPR04150010-D040 | ● | 4 | 4 | 1.5 | 3.5 | 31.5 | 15 | 0.3 | 0.1 |
| JBPR07140015-D050 | ● | 5 | 7 | 0.9 | 4.4 | 30 | 14 | 0.5 | 0.15 |
| JBPR07190015-D050 | ● | 5 | 7 | 0.9 | 4.4 | 35 | 19 | 0.5 | 0.15 |

● : Line-up

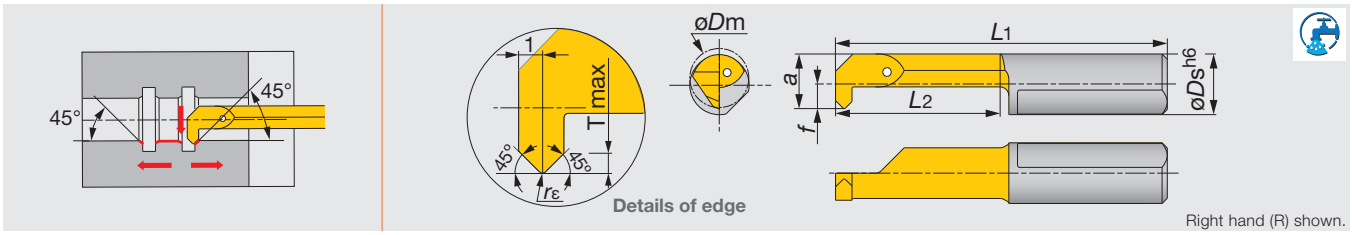
## TINY MTURN
### JBU R
Solid boring bars for back boring & chamfering




| Designation | SH730 | øDm | øDs | f | a | L1 | L2 | t | T max | W +0.05 0 |
|---|---|---|---|---|---|---|---|---|---|---|
| JBUR07140010-D050 | ● | 5 | 7 | 0.9 | 4.4 | 30 | 14 | 0.2 | 1 | 1 |
| JBUR07190010-D050 | ● | 5 | 7 | 0.9 | 4.4 | 35 | 19 | 0.2 | 1 | 1 |

● : Line-up

## TINY MTURN
### JBC R
Solid boring bars for Boring & 45° chamfering




| Designation | SH730 | øDm | øDs | f | a | L1 | L2 | T max | rε ±0.05 |
|---|---|---|---|---|---|---|---|---|---|
| JBCR07140020-D050 | ● | 5 | 7 | 0.9 | 4.4 | 30 | 14 | 0.7 | 0.2 |
| JBCR07190020-D050 | ● | 5 | 7 | 0.9 | 4.4 | 35 | 19 | 0.7 | 0.2 |
| JBCR07190020-D068 | ● | 6.8 | 7 | 2.8 | 6.3 | 35 | 19 | 0.7 | 0.2 |

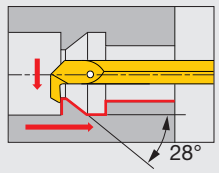
● : Line-up

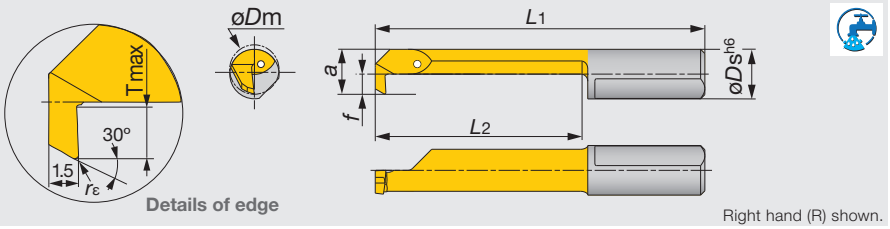
Standard cutting conditions → **B359**

TINY MTURN

## JBB R

### Solid boring bars for back boring



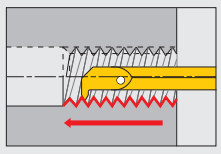

| Designation | SH730 | øDm | øDs | f | a | L1 | L2 | T max | rε+0.05 |
|---|---|---|---|---|---|---|---|---|---|
| JBBR04140020-D030 | ● | 3 | 4 | 0.6 | 2.6 | 30 | 14 | 0.5 | 0.2 |
| JBBR04190020-D030 | ● | 3 | 4 | 0.6 | 2.6 | 35 | 19 | 0.5 | 0.2 |
| JBBR04140015-D040 | ● | 4 | 4 | 1.5 | 3.5 | 30 | 14 | 0.8 | 0.15 |
| JBBR04240015-D040 | ● | 4 | 4 | 1.5 | 3.5 | 40 | 24 | 0.8 | 0.15 |
| JBBR07190020-D050 | ● | 5 | 7 | 0.9 | 4.4 | 35 | 19 | 1 | 0.2 |
| JBBR07290020-D050 | ● | 5 | 7 | 0.9 | 4.4 | 45 | 29 | 1 | 0.2 |
| JBBR07190020-D060 | ● | 6 | 7 | 1.8 | 5.3 | 35 | 19 | 1.8 | 0.2 |
| JBBR07290020-D060 | ● | 6 | 7 | 1.8 | 5.3 | 45 | 29 | 1.8 | 0.2 |
| JBBR07190020-D070 | ● | 7 | 7 | 2.8 | 6.3 | 35 | 19 | 2.5 | 0.2 |
| JBBR07290020-D070 | ● | 7 | 7 | 2.8 | 6.3 | 45 | 29 | 2.5 | 0.2 |

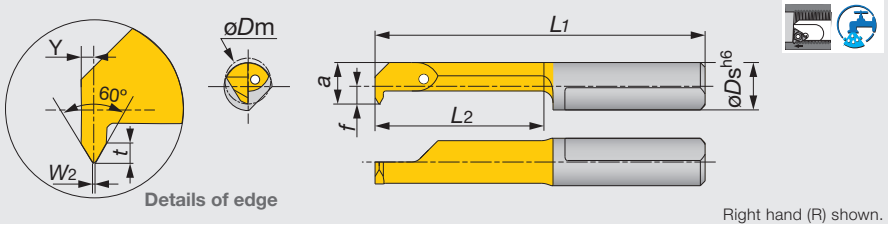
● : Line-up

TINY MTURN

## JBI R

### Solid boring bars for threading (metric)





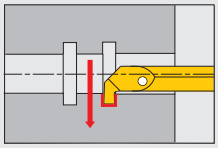

| Designation | SH730 | Pitch | øDm | W2-0 0.02 | øDs | f | a | L1 | L2 | t | Y |
|---|---|---|---|---|---|---|---|---|---|---|---|
| JBIR04140050-D040 | ● | 0.5 | 4 | 0.06 | 4 | 1.5 | 3.5 | 30 | 14 | 0.3 | 0.35 |
| JBIR07140050-D050 | ● | 0.5 | 5 | 0.06 | 7 | 0.9 | 4.4 | 30 | 14 | 0.3 | 0.35 |
| JBIR07140075-D050 | ● | 0.75 | 5 | 0.09 | 7 | 0.9 | 4.4 | 30 | 14 | 0.4 | 0.45 |
| JBIR07140100-D048 | ● | 1 | 4.8 | 0.12 | 7 | 0.9 | 4.4 | 30 | 14 | 0.6 | 0.55 |
| JBIR07140100-D060 | ● | 1 | 6 | 0.12 | 7 | 1.8 | 5.3 | 30 | 14 | 0.6 | 0.55 |
| JBIR07140125-D060 | ● | 1.25 | 6 | 0.15 | 7 | 1.8 | 5.3 | 30 | 14 | 0.7 | 0.65 |
| JBIR07140150-D060 | ● | 1.5 | 6 | 0.18 | 7 | 1.8 | 5.3 | 30 | 14 | 0.8 | 0.75 |
| JBIR07140150-D070 | ● | 1.5 | 7 | 0.18 | 7 | 2.8 | 6.3 | 30 | 14 | 0.8 | 0.75 |

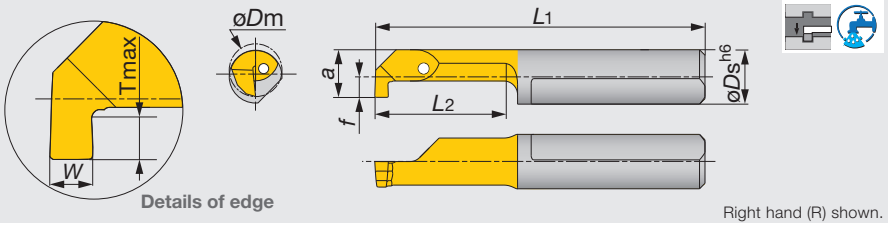
● : Line-up

Standard cutting conditions → **B359**

# JBG R/L

## Solid boring bars for internal grooving






| Designation | SH730 | $W^{+0.05}_{0}$ | øDm | øDs | f | a | L1 | L2 | T max |
|---|---|---|---|---|---|---|---|---|---|
| JBGR04050050-D020 | ● | 0.5 | 2 | 4 | 0.2 | 1.8 | 21 | 5 | 0.4 |
| JBGR04100050-D020 | ● | 0.5 | 2 | 4 | 0.2 | 1.8 | 26 | 10 | 0.4 |
| JBGR04050070-D030 | ● | 0.7 | 3 | 4 | 0.7 | 2.7 | 21 | 5 | 0.6 |
| JBGR04100070-D030 | ● | 0.7 | 3 | 4 | 0.7 | 2.7 | 26 | 10 | 0.6 |
| JBGR04090100-D040 | ● | 1 | 4 | 4 | 1.5 | 3.5 | 25.5 | 9 | 0.8 |
| JBGR04150100-D040 | ● | 1 | 4 | 4 | 1.5 | 3.5 | 31.5 | 15 | 0.8 |
| JBGR07090100-D050 | ● | 1 | 5 | 7 | 0.9 | 4.4 | 25 | 9 | 1 |
| JBGR07140100-D050 | ● | 1 | 5 | 7 | 0.9 | 4.4 | 30 | 14 | 1 |
| JBGR07090150-D050 | ● | 1.5 | 5 | 7 | 0.9 | 4.4 | 25 | 9 | 1 |
| JBGR07140150-D050 | ● | 1.5 | 5 | 7 | 0.9 | 4.4 | 30 | 14 | 1 |
| JBGR07090200-D050 | ● | 2 | 5 | 7 | 0.9 | 4.4 | 25 | 9 | 1 |
| JBGR07190200-D050 | ● | 2 | 5 | 7 | 0.9 | 4.4 | 35 | 19 | 1 |
| JBGR/L07090100-D060 | ● | 1 | 6 | 7 | 1.8 | 5.3 | 25 | 9 | 1.8 |
| JBGR07140100-D060 | ● | 1 | 6 | 7 | 1.8 | 5.3 | 30 | 14 | 1.8 |
| JBGR07210100-D060 | ● | 1 | 6 | 7 | 1.8 | 5.3 | 37 | 21 | 1.8 |
| JBGR07290100-D060 | ● | 1 | 6 | 7 | 1.8 | 5.3 | 45 | 29 | 1.8 |
| JBGR/L07090150-D060 | ● | 1.5 | 6 | 7 | 1.8 | 5.3 | 25 | 9 | 1.8 |
| JBGR07140150-D060 | ● | 1.5 | 6 | 7 | 1.8 | 5.3 | 30 | 14 | 1.8 |
| JBGR07210150-D060 | ● | 1.5 | 6 | 7 | 1.8 | 5.3 | 37 | 21 | 1.8 |
| JBGR07240150-D060 | ● | 1.5 | 6 | 7 | 1.8 | 5.3 | 40 | 24 | 1.8 |
| JBGR07290150-D060 | ● | 1.5 | 6 | 7 | 1.8 | 5.3 | 45 | 29 | 1.8 |
| JBGR07090200-D060 | ● | 2 | 6 | 7 | 1.8 | 5.3 | 25 | 9 | 1.8 |
| JBGR07140200-D060 | ● | 2 | 6 | 7 | 1.8 | 5.3 | 30 | 14 | 1.8 |
| JBGR07210200-D060 | ● | 2 | 6 | 7 | 1.8 | 5.3 | 37 | 21 | 1.8 |
| JBGR07240200-D060 | ● | 2 | 6 | 7 | 1.8 | 5.3 | 40 | 24 | 1.8 |
| JBGR07290200-D060 | ● | 2 | 6 | 7 | 1.8 | 5.3 | 45 | 29 | 1.8 |
| JBGR07090100-D068 | ● | 1 | 6.8 | 7 | 2.7 | 6.2 | 25 | 9 | 2.5 |
| JBGR07140100-D068 | ● | 1 | 6.8 | 7 | 2.7 | 6.2 | 30 | 14 | 2.5 |
| JBGR07210100-D068 | ● | 1 | 6.8 | 7 | 2.7 | 6.2 | 37 | 21 | 2.5 |
| JBGR07090150-D068 | ● | 1.5 | 6.8 | 7 | 2.7 | 6.2 | 25 | 9 | 2.5 |
| JBGR07140150-D068 | ● | 1.5 | 6.8 | 7 | 2.7 | 6.2 | 30 | 14 | 2.5 |
| JBGR07210150-D068 | ● | 1.5 | 6.8 | 7 | 2.7 | 6.2 | 37 | 21 | 2.5 |
| JBGR07290150-D068 | ● | 1.5 | 6.8 | 7 | 2.7 | 6.2 | 45 | 29 | 2.5 |
| JBGR07090200-D068 | ● | 2 | 6.8 | 7 | 2.7 | 6.2 | 25 | 9 | 2.5 |
| JBGR/L07140200-D068 | ● | 2 | 6.8 | 7 | 2.7 | 6.2 | 30 | 14 | 2.5 |
| JBGR07210200-D068 | ● | 2 | 6.8 | 7 | 2.7 | 6.2 | 37 | 21 | 2.5 |
| JBGR07250200-D068 | ● | 2 | 6.8 | 7 | 2.7 | 6.2 | 40 | 25 | 2.5 |
| JBGR07290200-D068 | ● | 2 | 6.8 | 7 | 2.7 | 6.2 | 45 | 29 | 2.5 |

* Corner radius : less than 0.1 mm.

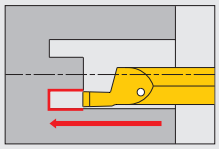
● : Line-up

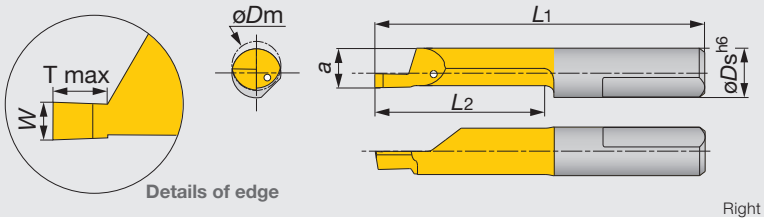


Standard cutting conditions → **B360**

## JBF R/L

Solid boring bars for face grooving






Right hand (R) shown.

| Designation | SH730 | $W^{+0.05}_{0}$ | øDm | øDs | a | L1 | L2 | T max |
|---|---|---|---|---|---|---|---|---|
| JBFR07110100-D060 | ● | 1 | 6 | 7 | 5.2 | 26 | 10 | 1.5 |
| JBFR07110150-D060 | ● | 1.5 | 6 | 7 | 5.2 | 26 | 10 | 2 |
| JBFR07110200-D060 | ● | 2 | 6 | 7 | 5.2 | 26 | 10 | 3 |
| JBFR07110100-D080 | ● | 1 | 8 | 7 | 5.9 | 27 | 11 | 1.5 |
| JBFR07110150-D080 | ● | 1.5 | 8 | 7 | 5.9 | 27 | 11 | 2.5 |
| JBFR07110200-D080 | ● | 2 | 8 | 7 | 5.9 | 27 | 11 | 3 |
| JBFR07110250-D080 | ● | 2.5 | 8 | 7 | 5.9 | 27 | 11 | 3.5 |
| JBFR07110300-D080 | ● | 3 | 8 | 7 | 5.9 | 27 | 11 | 3.5 |
| JBFR/L07210150-D080 | ● | 1.5 | 8 | 7 | 5.9 | 36 | 21 | 2.5 |
| JBFR07210200-D080 | ● | 2 | 8 | 7 | 5.9 | 36 | 21 | 3 |
| JBFR07210250-D080 | ● | 2.5 | 8 | 7 | 5.9 | 36 | 21 | 3.5 |
| JBFR07210300-D080 | ● | 3 | 8 | 7 | 5.9 | 36 | 21 | 3.5 |
| JBFR/L07300200-D080 | ● | 2 | 8 | 7 | 5.9 | 46 | 30 | 3 |
| JBFR07300300-D080 | ● | 3 | 8 | 7 | 5.9 | 46 | 30 | 3.5 |
| JBFR07200200-D080 | ● | 2 | 8 | 7 | 5.9 | 36 | 20 | 3 |
| JBFR07200250-D150 | ● | 2.5 | 15 | 7 | 5.9 | 36 | 20 | 20 |
| JBFR07200300-D150 | ● | 3 | 15 | 7 | 5.9 | 36 | 20 | 20 |
| JBFR07300300-D150 | ● | 3 | 15 | 7 | 5.9 | 46 | 30 | 30 |

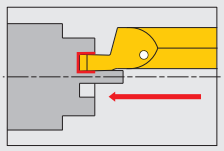
* Corner radius : less than 0.1 mm.

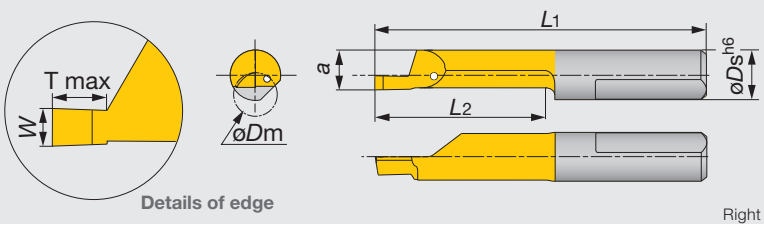
● : Line-up



## JBS R

Solid boring bars for face grooving (for shaft machining)






Right hand (R) shown.

| Designation | SH730 | $W^{+0.05}_{0}$ | øDm | øDs | a | L1 | L2 | T max |
|---|---|---|---|---|---|---|---|---|
| JBSR07200200-D060 | ● | 2 | 6 | 7 | 5.2 | 36 | 20 | 4 |

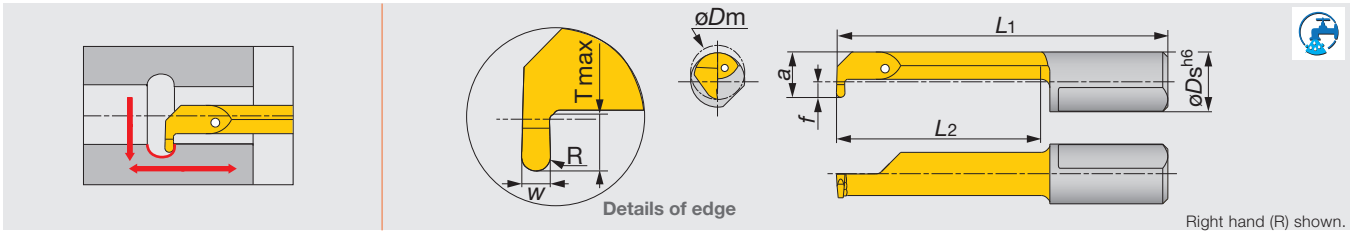
* Corner radius : less than 0.1 mm.

● : Line-up

Standard cutting conditions → **B360**

## JBR R

Solid boring bars for Boring & profiling (full radius type)




| Designation | SH730 | $W^{+0.05}_{0}$ | øDm | øDs | f | a | L1 | L2 | T max | R |
|---|---|---|---|---|---|---|---|---|---|---|
| JBRR07190050-D050 | ● | 1 | 5 | 7 | 0.9 | 4.4 | 35 | 19 | 1 | 0.5 |
| JBRR07240050-D060 | ● | 1 | 6 | 7 | 1.8 | 5.3 | 40 | 24 | 1.8 | 0.5 |
| JBRR07290050-D068 | ● | 1 | 6.8 | 7 | 2.8 | 6.3 | 45 | 29 | 2.5 | 0.5 |

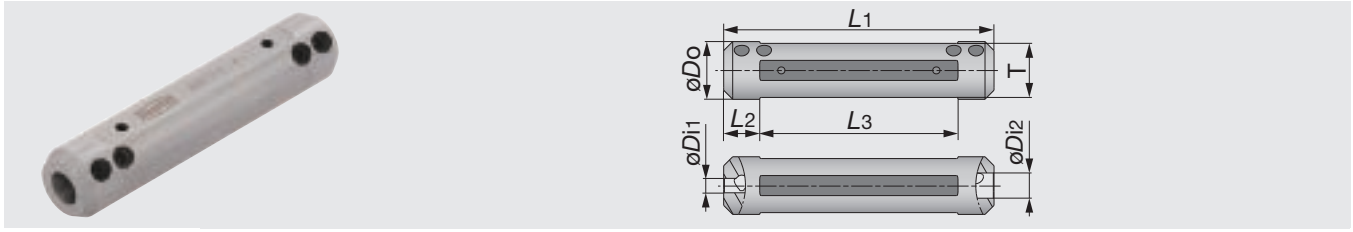
● : Line-up





## JBBS

Sleeve for external coolant supply




| Designation | øDo | øDi1 | øDi2 | L1 | L2 | L3 | T |
|---|---|---|---|---|---|---|---|
| JBBS12-4-4 | 12 | 4 | 4 | 75 | 10 | 55 | 10.3 |
| JBBS127-4-4 | 12.7 | 4 | 4 | 76.2 | 10 | 56.2 | 11.6 |
| JBBS14-4-4 | 14 | 4 | 4 | 75 | 10 | 55 | 12 |
| JBBS159-4-7 | 15.875 | 4 | 7 | 76.2 | 10 | 56.2 | 14 |
| JBBS16-4-7 | 16 | 4 | 7 | 75 | 10 | 55 | 15 |
| JBBS19-4-7 | 19.05 | 4 | 7 | 89 | 10 | 69 | 17.2 |
| JBBS20-4-7 | 20 | 4 | 7 | 90 | 10 | 70 | 18 |
| JBBS22-4-7 | 22 | 4 | 7 | 90 | 10 | 70 | 20 |
| JBBS25-4-7 | 25 | 4 | 7 | 100 | 10 | 80 | 23 |
| JBBS254-4-7 | 25.4 | 4 | 7 | 90 | 10 | 70 | 23.4 |

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| JBBS12-4-4 | SSHM5-4PF-S | P-2.5 |
| JBBS127-4-4 | SSHM5-6PF-S | P-2.5 |
| JBBS14-4-4 | SSHM5-4PF-S | P-2.5 |
| JBBS**-4-7 | SSHM5-6PF-S | P-2.5 |

Standard cutting conditions → **B359**

# JBBS-C

Sleeve for internal coolant supply





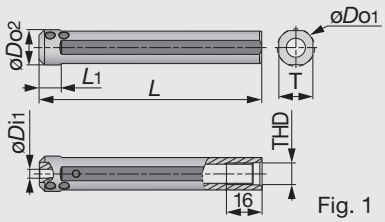



Fig. 1

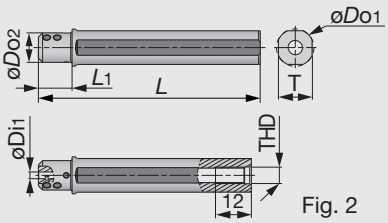



Fig. 2

| Designation | ø*D*o1 | ø*D*o2 | ø*D*i1 | *L* | *L*1 | T | THD | Fig. |
|---|---|---|---|---|---|---|---|---|
| JBBS159-4-L100C | 15.875 | 15.875 | 4 | 100 | 10 | 14.58 | R1/8 | 1 |
| JBBS159-7-L100C | 15.875 | 15.875 | 7 | 100 | 10 | 14.58 | R1/8 | 1 |
| JBBS16-4-L100C | 16 | 16 | 4 | 100 | 10 | 15 | R1/8 | 1 |
| JBBS16-7-L100C | 16 | 16 | 7 | 100 | 10 | 15 | R1/8 | 1 |
| JBBS19-4-L100C | 19.05 | 17.5 | 4 | 100 | 20 | 17.2 | R1/8 | 2 |
| JBBS19-7-L100C | 19.05 | 17.5 | 7 | 100 | 20 | 17.2 | R1/8 | 2 |
| JBBS20-4-L100C | 20 | 17.5 | 4 | 100 | 20 | 18 | R1/8 | 2 |
| JBBS20-7-L100C | 20 | 17.5 | 7 | 100 | 20 | 18 | R1/8 | 2 |
| JBBS22-4-L100C | 22 | 17.5 | 4 | 100 | 20 | 20 | R1/8 | 2 |
| JBBS22-7-L100C | 22 | 17.5 | 7 | 100 | 20 | 20 | R1/8 | 2 |
| JBBS25-4-L100C | 25 | 18 | 4 | 100 | 23 | 23 | R1/8 | 2 |
| JBBS25-7-L100C | 25 | 18 | 7 | 100 | 23 | 23 | R1/8 | 2 |
| JBBS254-4-L100C | 25.4 | 18 | 4 | 100 | 23 | 23.4 | R1/8 | 2 |
| JBBS254-7-L100C | 25.4 | 18 | 7 | 100 | 23 | 23.4 | R1/8 | 2 |

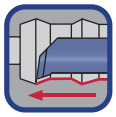
## SPARE PARTS





| Designation | Clamping screw | Wrench |
|---|---|---|
| JBBS**-4-L100C | SSHM5-6PF-S | P-2.5 |
| JBBS**-7-L100C | SSHM5-4PF-S | P-2.5 |

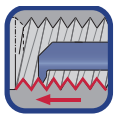
## STANDARD CUTTING CONDITIONS



Boring, profiling, chamfering, back boring

| ISO | Workpiece material | Grade | Cutting speed *Vc* (m/min) | Feed *f* (mm/rev) |
|---|---|---|---|---|
| P | Low carbon steels (C15, C25 etc.) | SH730 | 40 - 140 | 0.01 - 0.08 * |
| P | Carbon steels, Alloy steels (C55, 42CrMoS4 etc.) | SH730 | 40 - 140 | 0.01 - 0.08 * |
| P | Prehardened steels (NAK80, PX5 etc.) | SH730 | 40 - 140 | 0.01 - 0.08 * |
| M | Stainless steels (X5CrNi18-9, X5CrNiMo17-12-2 etc) | SH730 | 40 - 140 | 0.01 - 0.08 * |
| K | Grey cast irons (250, 300 etc.) | SH730 | 30 - 100 | 0.01 - 0.08 * |
| K | Ductile cast irons (400-15, 600-3 etc.) | SH730 | 30 - 100 | 0.01 - 0.08 * |
| N | Aluminium alloys, copper alloys (Si < 12%) | SH730 | 90 - 200 | 0.01 - 0.08 * |
| S | Titanium alloys (Ti-6Al-4V, etc.) | SH730 | 30 - 100 | 0.01 - 0.08 * |
| S | Superalloys (Inconel718, etc.) | SH730 | 30 - 100 | 0.01 - 0.08 * |

* JBTR/L04020004-D006, JBTR/L04030004-D006
Max. *f* = 0.01 mm/rev



Threading (metric thread)

| ISO | Workpiece material | Grade | Cutting speed *Vc* (m/min) | Number of passes Pitch (mm) 0.5 | 0.75 | 1 | 1.25 | 1.5 |
|---|---|---|---|---|---|---|---|---|
| P | Low carbon steels (C15, C25 etc.) | SH730 | 40 - 140 | 6 - 8 | 8 - 10 | 10 - 12 | 12 - 15 | 15 - 18 |
| P | Carbon steels, Alloy steels (C55, 42CrMoS4 etc.) | SH730 | 40 - 140 | 6 - 8 | 8 - 10 | 10 - 12 | 12 - 15 | 15 - 18 |
| P | Prehardened steels (NAK80, PX5 etc.) | SH730 | 40 - 140 | 6 - 8 | 8 - 10 | 10 - 12 | 12 - 15 | 15 - 18 |
| M | Stainless steels (X5CrNi18-9, X5CrNiMo17-12-2 etc) | SH730 | 40 - 140 | 8 | 10 | 12 | 15 | 18 |
| K | Grey cast irons (250, 300 etc.) | SH730 | 30 - 100 | 7 | 9 | 12 | 14 | 17 |
| K | Ductile cast irons (400-15, 600-3 etc.) | SH730 | 30 - 100 | 7 | 9 | 12 | 14 | 17 |
| N | Aluminium alloys, copper alloys (Si < 12%) | SH730 | 90 - 200 | 6 | 8 | 10 | 12 | 15 |

## STANDARD CUTTING CONDITIONS



### Internal grooving

| ISO | Workpiece material | Grade | Cutting speed *Vc* (m/min) | Feed *f* (mm/rev) |
|---|---|---|---|---|
| P | Low carbon steels (C15, C25 etc.) | SH730 | 40 - 140 | 0.01 - 0.03 |
| P | Carbon steels, Alloy steels (C55, 42CrMoS4 etc.) | SH730 | 40 - 140 | 0.01 - 0.03 |
| P | Prehardened steels (NAK80, PX5 etc.) | SH730 | 40 - 140 | 0.01 - 0.03 |
| M | Stainless steels (X5CrNi18-9, X5CrNiMo17-12-2 etc) | SH730 | 40 - 140 | 0.01 - 0.03 |
| K | Grey cast irons (250, 300 etc.) | SH730 | 30 - 100 | 0.01 - 0.03 |
| K | Ductile cast irons (400-15, 600-3 etc.) | SH730 | 30 - 100 | 0.01 - 0.03 |
| N | Aluminium alloys, copper alloys (Si < 12%) | SH730 | 90 - 200 | 0.01 - 0.03 |
| S | Titanium alloys (Ti-6Al-4V etc.) | SH730 | 30 - 100 | 0.01 - 0.03 |
| S | Superalloys (Inconel718, etc.) | SH730 | 30 - 100 | 0.01 - 0.03 |



### Face grooving

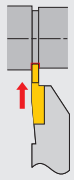
| ISO | Workpiece material | Grade | Cutting speed *Vc* (m/min) | Feed *f* (mm/rev) |
|---|---|---|---|---|
| P | Low carbon steels (C15, C25 etc.) | SH730 | 40 - 140 | 0.01 - 0.05 |
| P | Carbon steels, Alloy steels (C55, 42CrMoS4 etc.) | SH730 | 40 - 140 | 0.01 - 0.05 |
| P | Prehardened steels (NAK80, PX5 etc.) | SH730 | 40 - 140 | 0.01 - 0.05 |
| M | Stainless steels (X5CrNi18-9, X5CrNiMo17-12-2 etc) | SH730 | 40 - 140 | 0.01 - 0.05 |
| K | Grey cast irons (250, 300 etc.) | SH730 | 30 - 100 | 0.01 - 0.05 |
| K | Ductile cast irons (400-15, 600-3 etc.) | SH730 | 30 - 100 | 0.01 - 0.05 |
| N | Aluminium alloys, copper alloys (Si < 12%) | SH730 | 90 - 200 | 0.01 - 0.05 |
| S | Titanium alloys (Ti-6Al-4V etc.) | SH730 | 30 - 100 | 0.01 - 0.05 |
| S | Superalloys (Inconel718, etc.) | SH730 | 30 - 100 | 0.01 - 0.05 |

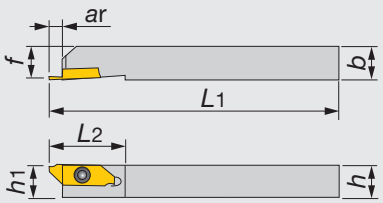
MEMO

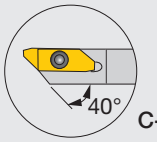
# JSXGR/L

Screw-on toolholder without offset for front / reverse turning & external grooving








C-type

Right hand (R) shown.

| Designation | W | ar | h | b | $L_1$ | $L_2$ | $h_1$ | f | Insert |
|---|---|---|---|---|---|---|---|---|---|
| JSXGR/L1010K8-C | 0.7 - 2 | 6.7 | 10 | 10 | 125 | 29 | 10 | 10 | JX*R/L8... |
| JSXGR/L1212K8-C | 0.7 - 2 | 6.7 | 12 | 12 | 125 | 29 | 12 | 12 | JX*R/L8... |
| JSXGR/L1616K8 | 0.7 - 2 | 6.5 | 16 | 16 | 125 | 29 | 16 | 16 | JX*R/L8... |
| JSXGR/L2020K8 | 0.7 - 2 | 6.5 | 20 | 20 | 125 | 29 | 20 | 20 | JX*R/L8... |
| JSXGR/L2525K8 | 0.7 - 2 | 6.5 | 25 | 25 | 125 | 29 | 25 | 25 | JX*R/L8... |

- Can be wrenched also from the back with a double-head screw.
- This toolholders can be used for JXG insert (grooving), JXF insert (front-turning), JXK insert (reverse-turning).

## SPARE PARTS





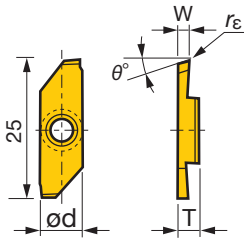
| Designation | Clamping screw | Wrench | Wrench 1 |
|---|---|---|---|
| JSXGR/L | CSTB-4SD | T-8F | (T-8L) |

*Optional

## INSERT

### JXG (handed insert with sharp edge)






Right hand (R) shown.

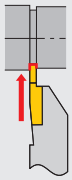
| Designation | rε | Coating J740 R | Coating J740 L | Uncoated TH10 R | Uncoated TH10 L | ød | T | $W^{+0.05}_{0}$ | θ° | Max. groove depth |
|---|---|---|---|---|---|---|---|---|---|---|
| JXGR/L8070FA | 0 | ● | ● | ● | ● | 8 | 3.97 | 0.7 | 15 | 4.5 |
| JXGR/L8070FA-005 | 0.05 | ● | | | | 8 | 3.97 | 0.7 | 15 | 4.5 |
| JXGR/L8100FA | 0 | ● | ● | ● | ● | 8 | 3.97 | 1 | 15 | 6 |
| JXGR/L8100FA-005 | 0.05 | ● | | | | 8 | 3.97 | 1 | 15 | 6 |
| JXGR/L8100FA45 | 0 | ● | | ● | | 8 | 3.97 | 1 | 15 | 4.5 |
| JXGR/L8100FA45-005 | 0.05 | ● | | | | 8 | 3.97 | 1 | 15 | 4.5 |
| JXGR/L8150FA | 0 | ● | ● | ● | ● | 8 | 3.97 | 1.5 | 15 | 6 |
| JXGR/L8150FA-005 | 0.05 | ● | | | | 8 | 3.97 | 1.5 | 15 | 6 |
| JXGR/L8150FA50 | 0 | ● | | ● | | 8 | 3.97 | 1.5 | 15 | 5 |
| JXGR/L8150FA50-005 | 0.05 | ● | | | | 8 | 3.97 | 1.5 | 15 | 5 |
| JXGR/L8180FA | 0 | ● | | ● | | 8 | 3.97 | 1.8 | 15 | 6 |
| JXGR/L8180FA-005 | 0.05 | ● | | | | 8 | 3.97 | 1.8 | 15 | 6 |
| JXGR/L8200FA | 0 | ● | ● | ● | ● | 8 | 3.97 | 2 | 15 | 6 |
| JXGR/L8200FA-005 | 0.05 | ● | | | | 8 | 3.97 | 2 | 15 | 6 |
| JXGR/L8200FN | 0 | ● | ● | ● | ● | 8 | 3.97 | 2 | 0 | 6 |
| JXGR/L8200FN-005 | 0.05 | ● | | | | 8 | 3.97 | 2 | 0 | 6 |

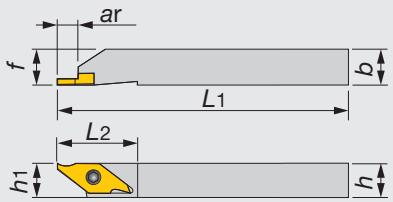
● : Line-up

Standard cutting conditions → **B364**

# JSVGR/L

## External grooving toolholders






C-type

Right hand (R) shown.

| Designation | W | ar | h | b | $L_1$ | $L_2$ | $h_1$ | f | Insert |
|---|---|---|---|---|---|---|---|---|---|
| JSVGR/L1010K-C | 0.33 - 2 | 6.2 | 10 | 10 | 125 | 23 | 10 | 10 | JVGR/L... |
| JSVGR/L1212K-C | 0.33 - 2 | 6.2 | 12 | 12 | 125 | 23 | 12 | 12 | JVGR/L... |
| JSVGR/L1616K | 0.33 - 2 | 6.2 | 16 | 16 | 125 | 23 | 16 | 16 | JVGR/L... |

• Recommend clamping torque: 2.3 N·m

### SPARE PARTS

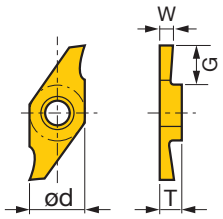
| Designation | Clamping screw | Wrench | Wrench 1 |
|---|---|---|---|
| JSVGR/L | CSTB-3S | T-9F | (T-8L) |

*Optional

## INSERT

### JVG (handed insert with sharp edge)






Right hand (R) shown.

| Designation | Coating | | | | Cermet | | Uncoated | | ød | T | $W^{+0.05}_{0}$ | G | Max. groove depth |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | SH725 | | J740 | | NS9530 | | TH10 | | | | | | |
| | R | L | R | L | R | L | R | L | | | | | |
| JVGR/L033F | ● | ● | ● | | | | ● | | 7.94 | 3.18 | 0.33 | 0.8 | 0.7 |
| JVGR/L050F | ● | ● | ● | | | | ● | | 7.94 | 3.18 | 0.5 | 1.2 | 1.1 |
| JVGR/L075F | ● | ● | ● | | | | ● | | 7.94 | 3.18 | 0.75 | 2 | 1.9 |
| JVGR/L095F | ● | ● | ● | | | | ● | | 7.94 | 3.18 | 0.95 | 2 | 1.9 |
| JVGR/L100F | ● | ● | ● | | ● | ● | ● | ● | 7.94 | 3.18 | 1 | 6 | 5.5 |
| JVGR/L125F | ● | ● | ● | | | | ● | | 7.94 | 3.18 | 1.25 | 5.5 | 5 |
| JVGR/L150F | ● | ● | ● | | ● | ● | ● | ● | 7.94 | 3.18 | 1.5 | 6 | 5.5 |
| JVGR/L200F | ● | ● | ● | | ● | | ● | | 7.94 | 3.18 | 2 | 6 | 5.5 |

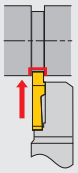
● : Line-up

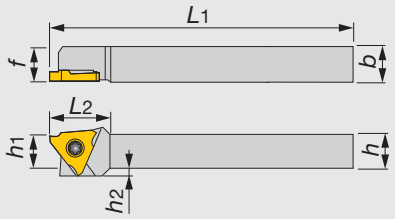
Standard cutting conditions → **B364**

## STANDARD CUTTING CONDITIONS (JXG type, JVG type insert)

| ISO | Workpiece material | Grade | Cutting speed *Vc* (m/min) | Feed *f* (mm/rev) |
|---|---|---|---|---|
| P | General steel (C45, etc.) | SH725 | 50 - 200 | 0.01 - 0.1 |
| | | J740 | 10 - 100 | 0.01 - 0.1 |
| | | NS9530 | 50 - 150 | 0.01 - 0.1 |
| | Free-cutting steel (11SMn28, etc.) | SH725 | 50 - 200 | 0.01 - 0.1 |
| | | J740 | 10 - 100 | 0.01 - 0.1 |
| M | Stainless steel (X10CrNiS18-9, etc.) | SH725 | 50 - 200 | 0.01 - 0.1 |
| | | J740 | 10 - 100 | 0.01 - 0.1 |
| | | NS9530 | 50 - 150 | 0.01 - 0.1 |
| N | Aluminium alloys, Brass (Si < 12%, C3604B / CW614N, etc.) | TH10 | 10 - 200 | 0.01 - 0.1 |
| S | Difficult-to-machine material, Titanium alloys (Ti-6Al-4V, etc.) | TH10 | 10 - 30 | 0.01 - 0.1 |

# J-SERIES
## JSTGR/L
External grooving toolholders






Right hand (R) shown.

| Designation | W | h | b | L1 | L2 | h1 | f | h2 | Insert |
|---|---|---|---|---|---|---|---|---|---|
| JSTGR/L1010X3 | 0.33 - 3 | 10 | 10 | 120 | 18.5 | 10 | 10 | 2 | JTGR/L3... |
| JSTGR/L1212F3 | 0.33 - 3 | 12 | 12 | 85 | 18.5 | 12 | 12 | - | JTGR/L3... |
| JSTGR/L1212X3 | 0.33 - 3 | 12 | 12 | 120 | 18.5 | 12 | 12 | - | JTGR/L3... |
| JSTGR/L1616X3 | 0.33 - 3 | 16 | 16 | 120 | 18.5 | 16 | 16 | - | JTGR/L3... |
| JSTGL1616K3 | 0.33 - 3 | 16 | 16 | 125 | 18.5 | 16 | 16 | - | JTGR/L3... |

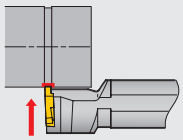
• Recommend clamping torque: 1.2 N·m

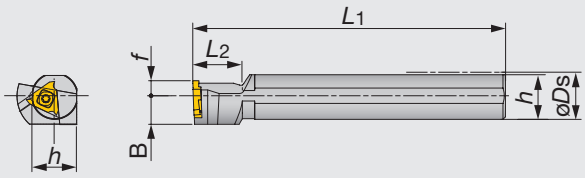
**SPARE PARTS**

| Designation | Clamping screw | Wrench | Wrench 1 |
|---|---|---|---|
| JSTGR/L... | CSTB-4SD | T-8F | (T-8L) |

*Optional

# J-SERIES
## JS-TGL3
External grooving toolholders






Left hand (L) shown.

| Designation | W | øDs | f | L1 | L2 | h | B | Insert |
|---|---|---|---|---|---|---|---|---|
| JS19K-TGL3 | 0.33 - 3 | 19.05 | 6 | 125 | 20 | 18 | 11.5 | JTGR3... |
| JS20K-TGL3 | 0.33 - 3 | 20 | 6 | 125 | 20 | 19 | 11.5 | JTGR3... |
| JS22K-TGL3 | 0.33 - 3 | 22 | 6 | 125 | 20 | 21 | 11.5 | JTGR3... |
| JS25K-TGL3 | 0.33 - 3 | 25.4 | 10 | 125 | 20 | 24 | 12.7 | JTGR3... |

• Left hand toolholders (TGL3) are used with right hand inserts (JTGR3). • Recommend clamping torque: 3.0 N·m

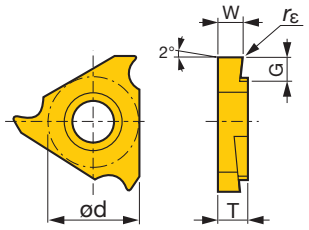
**SPARE PARTS**

| Designation | Clamping screw | Wrench |
|---|---|---|
| JS**-TGL3 | CSTB-4S | T-15F |

JSTGR/L, JS-TGL3: Inserts → **B366 -**, Standard cutting conditions → **B367**

## JTG (sharp edge)






Right hand (R) shown.

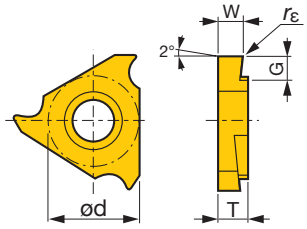


| Designation | rε | Coating | | | | Cermet | | Uncoated | | ød | T | W$^{+0.05}_{0}$ | G | Max. groove depth |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | SH725 | | J740 | | NS9530 | | TH10 | | | | | | |
| | | R | L | R | L | R | L | R | L | | | | | |
| JTGR/L3033F | 0.03 | ● | | ● | ● | | | ● | ● | 9.525 | 3.18 | 0.33 | 0.8 | 0.7 |
| JTGR/L3033F-005 | 0.05 | ● | | | | | | | | 9.525 | 3.18 | 0.33 | 0.8 | 0.7 |
| JTGR/L3043F | 0.03 | | | ● | | | | | | 9.525 | 3.18 | 0.43 | 1.2 | 1.1 |
| JTGR/L3050F | 0.03 | ● | ● | ● | ● | ● | | ● | ● | 9.525 | 3.18 | 0.5 | 1.2 | 1.1 |
| JTGR/L3050F-005 | 0.05 | ● | ● | | | | | | | 9.525 | 3.18 | 0.5 | 1.2 | 1.1 |
| JTGR/L3065F | 0.03 | ● | | ● | | | | | | 9.525 | 3.18 | 0.65 | 2 | 1.9 |
| JTGR/L3065F-010 | 0.1 | ● | | | | | | | | 9.525 | 3.18 | 0.65 | 2 | 1.9 |
| JTGR/L3075F | 0.03 | ● | ● | ● | ● | ● | ● | ● | ● | 9.525 | 3.18 | 0.75 | 2 | 1.9 |
| JTGR/L3075F-010 | 0.1 | ● | ● | | | | | | | 9.525 | 3.18 | 0.75 | 2 | 1.9 |
| JTGR/L3080F | 0.03 | ● | | ● | | | | | | 9.525 | 3.18 | 0.8 | 2 | 1.9 |
| JTGR/L3080F-010 | 0.1 | ● | | | | | | | | 9.525 | 3.18 | 0.8 | 2 | 1.9 |
| JTGR/L3085F | 0.03 | ● | | ● | | | | | | 9.525 | 3.18 | 0.85 | 2 | 1.9 |
| JTGR/L3095F | 0.03 | ● | ● | ● | ● | ● | | ● | ● | 9.525 | 3.18 | 0.95 | 2 | 1.9 |
| JTGR/L3095F-010 | 0.1 | ● | ● | | | | | | | 9.525 | 3.18 | 0.95 | 2 | 1.9 |
| JTGR/L3100F | 0.05 | ● | ● | ● | ● | ● | | ● | ● | 9.525 | 3.18 | 1 | 2.2 | 2.1 |
| JTGR/L3100F-010 | 0.1 | ● | ● | | | | | | | 9.525 | 3.18 | 1 | 2.2 | 2.1 |
| JTGR/L3110F | 0.05 | ● | | ● | | | | | | 9.525 | 3.18 | 1.1 | 2.2 | 2.1 |
| JTGR/L3120F | 0.05 | ● | | ● | | | | | | 9.525 | 3.18 | 1.2 | 2.2 | 2.1 |
| JTGR/L3120F-010 | 0.1 | ● | | | | | | | | 9.525 | 3.18 | 1.2 | 2.2 | 2.1 |
| JTGR/L3125F | 0.05 | ● | ● | ● | ● | ● | | ● | ● | 9.525 | 3.18 | 1.25 | 2.2 | 2.1 |
| JTGR/L3125F-010 | 0.1 | ● | ● | | | | | | | 9.525 | 3.18 | 1.25 | 2.2 | 2.1 |
| JTGR/L3130F | 0.05 | ● | | ● | | | | | | 9.525 | 3.18 | 1.3 | 2.2 | 2.1 |
| JTGR/L3140F | 0.05 | ● | | ● | | | | | | 9.525 | 3.18 | 1.4 | 2.2 | 2.1 |
| JTGR/L3140F-010 | 0.1 | ● | | | | | | | | 9.525 | 3.18 | 1.4 | 2.2 | 2.1 |
| JTGR/L3145F | 0.05 | ● | | ● | ● | ● | | ● | ● | 9.525 | 3.18 | 1.45 | 2.2 | 2.1 |
| JTGR/L3145F-010 | 0.1 | ● | | | | | | | | 9.525 | 3.18 | 1.45 | 2.2 | 2.1 |
| JTGR/L3150F | 0.05 | ● | ● | ● | ● | ● | | ● | ● | 9.525 | 3.18 | 1.5 | 2.2 | 2.1 |
| JTGR/L3150F-010 | 0.1 | ● | ● | | | | | | | 9.525 | 3.18 | 1.5 | 2.2 | 2.1 |
| JTGR/L3175F | 0.05 | ● | | ● | ● | ● | ● | ● | ● | 9.525 | 3.18 | 1.75 | 2.2 | 2.1 |
| JTGR/L3175F-010 | 0.1 | ● | | | | | | | | 9.525 | 3.18 | 1.75 | 2.2 | 2.1 |
| JTGR/L3180F | 0.05 | ● | | ● | | | | | | 9.525 | 3.18 | 1.8 | 2.2 | 2.1 |
| JTGR/L3200F | 0.05 | ● | ● | ● | ● | ● | | ● | ● | 9.525 | 3.18 | 2 | 2.7 | 2.6 |
| JTGR/L3200F-010 | 0.1 | ● | ● | | | | | | | 9.525 | 3.18 | 2 | 2.7 | 2.6 |
| JTGR/L3225F | 0.05 | ● | | ● | | | | | | 9.525 | 3.18 | 2.25 | 2.7 | 2.6 |
| JTGR/L3250F | 0.05 | ● | ● | ● | ● | ● | | ● | ● | 9.525 | 3.18 | 2.5 | 2.7 | 2.6 |
| JTGR/L3250F-010 | 0.1 | ● | ● | | | | | | | 9.525 | 3.18 | 2.5 | 2.7 | 2.6 |
| JTGR/L3275F | 0.05 | | | ● | | | | | | 9.525 | 3.18 | 2.75 | 2.7 | 2.6 |
| JTGR/L3300F | 0.05 | ● | | ● | | | | | | 9.525 | 3.18 | 3 | 2.7 | 2.6 |
| JTGR/L3300F-010 | 0.1 | ● | | | | | | | | 9.525 | 3.18 | 3 | 2.7 | 2.6 |

● : Line-up

## JTG (with horning)






Right hand (R) shown.

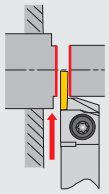
| Designation | rε | Coated cermet J9530 R | Coated cermet J9530 L | ød | T | $W^{+0.05}_{0}$ | G | Max. groove depth |
|---|---|---|---|---|---|---|---|---|
| JTGR/L3100 | 0.05 | ● | | 9.525 | 3.18 | 1 | 2.2 | 2.1 |
| JTGR/L3125 | 0.05 | ● | | 9.525 | 3.18 | 1.25 | 2.2 | 2.1 |
| JTGR/L3150 | 0.05 | ● | | 9.525 | 3.18 | 1.5 | 2.2 | 2.1 |
| JTGR/L3200 | 0.05 | ● | | 9.525 | 3.18 | 2 | 2.7 | 2.6 |

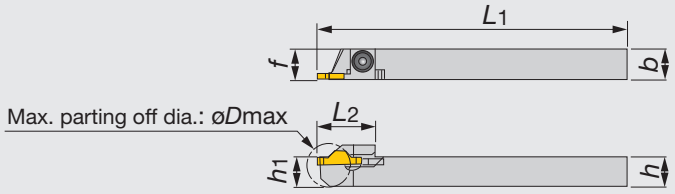
● : Line-up



## STANDARD CUTTING CONDITIONS (JTG type insert)

| ISO | Workpiece material | Grade | Cutting speed *Vc* (m/min) | Feed *f* (mm/rev) |
|---|---|---|---|---|
| P | General steel (C45, etc.) | SH725 | 50 - 200 | 0.01 - 0.1 |
| | | J740 | 10 - 100 | 0.01 - 0.1 |
| | | NS9530 | 50 - 150 | 0.01 - 0.1 |
| | | J9530 | 50 - 150 | 0.01 - 0.1 |
| | Free-cutting steel (11SMn28, etc.) | SH725 | 50 - 200 | 0.01 - 0.1 |
| | | J740 | 10 - 100 | 0.01 - 0.1 |
| M | Stainless steel (X10CrNiS18-9, etc.) | SH725 | 50 - 200 | 0.01 - 0.1 |
| | | J740 | 10 - 100 | 0.01 - 0.1 |
| | | NS9530 | 50 - 150 | 0.01 - 0.1 |
| | | J9530 | 50 - 150 | 0.01 - 0.1 |
| N | Aluminium alloys, Brass (Si < 12%, C3604B / CW614N, etc.) | TH10 | 10 - 200 | 0.01 - 0.1 |
| S | Difficult-to-machine material, Titanium alloys (Ti-6Al-4V, etc.) | TH10 | 10 - 30 | 0.01 - 0.1 |






Right hand (R) shown.

| Designation | W | øDmax | h | b | L1 | L2 | h1 | f | Insert |
|---|---|---|---|---|---|---|---|---|---|
| JCCWSR/L1010K2 | 2 | 20 | 10 | 10 | 125 | 19 | 10 | 10 | JCC*200F... |
| JCCWSR/L1212K2 | 2 | 20 | 12 | 12 | 125 | 19 | 12 | 12 | JCC*200F... |
| JCCWSR/L1616K2 | 2 | 20 | 16 | 16 | 125 | 19 | 16 | 16 | JCC*200F... |
| JCCWSR/L2020K2 | 2 | 20 | 20 | 20 | 125 | 19 | 20 | 20 | JCC*200F... |
| JCCWSR/L2525K2 | 2 | 20 | 25 | 25 | 125 | 19 | 25 | 25 | JCC*200F... |

## SPARE PARTS

| Designation | Clamping screw | Wrench | Wrench1 |
|---|---|---|---|
| JCCWSR/L... | CSTB-4S | T-15F | (T-15L) |

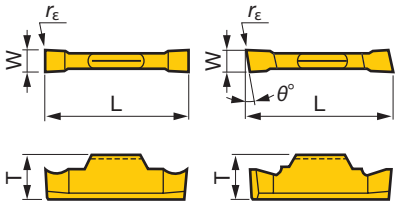
*Optional

## INSERT

### JCC (sharp edge)



Neutral (JCCN200F) / Handed insert (JCCR/L200F)




Right hand (R) shown.

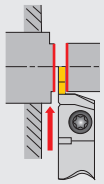
| Designation | rε | Coating J740 R | Coating J740 N | Coating J740 L | Uncoated TH10 R | Uncoated TH10 N | Uncoated TH10 L | T | W | L | θ° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| JCCN200F | 0 | | ● | | | ● | | 4.8 | 2 | 15 | - |
| JCCN200F-005 | 0.05 | | ● | | | | | 4.8 | 2 | 15 | - |
| JCCR/L200F | 0 | ● | | ● | ● | | ● | 4.8 | 2 | 15 | 15 |
| JCCR/L200F-005 | 0.05 | ● | | ● | | | | 4.8 | 2 | 15 | 15 |

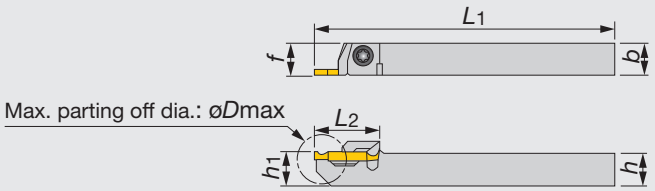
● : Line-up

Standard cutting conditions → **B369**

# JCGWSR/L

External grooving & parting-off toolholders






Right hand (R) shown.

| Designation | W | øDmax | h | b | L1 | L2 | h1 | f | Insert |
|---|---|---|---|---|---|---|---|---|---|
| JCGWSR/L1010K2 | 2 | 20 | 10 | 10 | 125 | 20 | 10 | 10 | JCGN200F... |
| JCGWSR/L1212K2 | 2 | 20 | 12 | 12 | 125 | 20 | 12 | 12 | JCGN200F... |
| JCGWSR/L1616K2 | 2 | 20 | 16 | 16 | 125 | 20 | 16 | 16 | JCGN200F... |

## SPARE PARTS

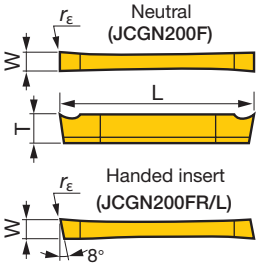
| Designation | Clamping screw | Wrench | Wrench 1 |
|---|---|---|---|
| JCGWSR/L... | CSTB-4S | T-15F | (T-15L) |

*Optional

## INSERT

### JCG (sharp edge)





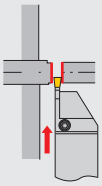

Right hand (R) shown.

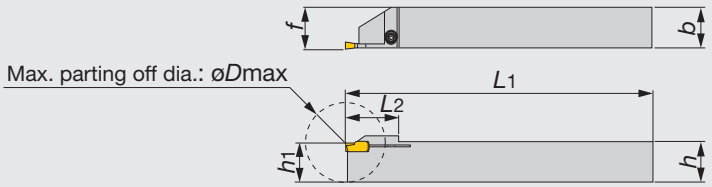
| Designation | rε | Coating J740 R | Coating J740 N | Coating J740 L | Uncoated TH10 R | Uncoated TH10 N | Uncoated TH10 L | T | W | L |
|---|---|---|---|---|---|---|---|---|---|---|
| JCGN200F | 0.05 | | ● | | | ● | | 3 | 2 | 20 |
| JCGN200FR/L | 0.05 | ● | | ● | ● | | ● | 3 | 2 | 20 |

● : Line-up

## STANDARD CUTTING CONDITIONS (JCC type, JCG type insert)

| ISO | Workpiece material | Grade | Cutting speed Vc (m/min) | Feed f (mm/rev) |
|---|---|---|---|---|
| P | General steel (C45, etc.) | J740 | 10 - 100 | 0.01 - 0.1 |
| P | Free-cutting steel (11SMn28, etc.) | J740 | 10 - 100 | 0.01 - 0.1 |
| M | Stainless steel (X10CrNiS18-9, etc.) | J740 | 10 - 100 | 0.01 - 0.1 |
| N | Aluminium alloys, Brass (Si < 12%, C3604B / CW614N, etc.) | TH10 | 10 - 200 | 0.01 - 0.1 |
| S | Difficult-to-machine material, Titanium alloys (Ti-6Al-4V, etc.) | TH10 | 10 - 30 | 0.01 - 0.1 |






Right hand (R) shown.

| Designation | W | øDmax | h | b | L1 | L2 | h1 | f | Insert |
|---|---|---|---|---|---|---|---|---|---|
| JCGSSR/L1010-20 | 2 | 20 | 10 | 10 | 125 | 15 | 10 | 10.2 | GE20... |
| JCGSSR/L1212-20 | 2 | 25 | 12 | 12 | 125 | 19 | 12 | 12.2 | GE20... |
| JCGSSR/L1616-20 | 2 | 32 | 16 | 16 | 125 | 22.5 | 16 | 16.2 | GE20... |

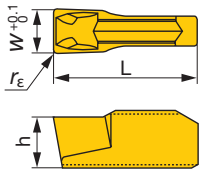
**SPARE PARTS**

| Designation | Clamping screw | Wrench |
|---|---|---|
| JCGSSR/L... | CSTB-3 | T-9F |

## INSERT

### GE20



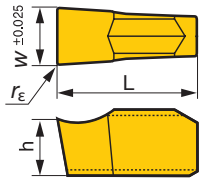



| Designation | rε | Coating GH730 | Cermet NS9530 | W | L | h |
|---|---|---|---|---|---|---|
| GE20 | 0.2 | ● | ● | 2 | 10 | 3.5 |

● : Line-up

For aluminium and non-ferrous metals






| Designation | rε | Uncoated KS05F | W | L | h |
|---|---|---|---|---|---|
| GE20-AL | 0.2 | ● | 2 | 10 | 3.5 |

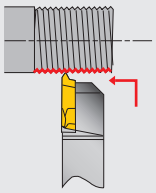
● : Line-up

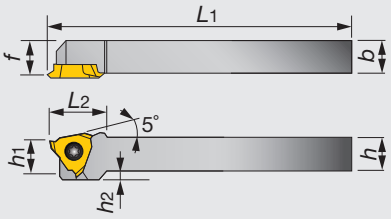
Standard cutting conditions → **B371**

## STANDARD CUTTING CONDITIONS (GE type insert)

| ISO | Workpiece material | Grade | Cutting speed *Vc* (m/min) | Feed *f* (mm/rev) |
|---|---|---|---|---|
| P | Low carbon steels<br>Alloy steels<br>( ~ 150HB) | NS9530 | 100 ~ 200 | 0.05 - 0.14 |
| | | GH730 | 50 ~ 180 | 0.05 - 0.14 |
| | Medium carbon steels<br>Alloy steels<br>(150 ~ 250HB) | NS9530 | 80 ~ 180 | 0.05 - 0.14 |
| | | GH730 | 50 ~ 150 | 0.05 - 0.14 |
| | High carbon steels<br>Alloy steels<br>(250HB ~ ) | NS9530 | 80 ~ 150 | 0.05 - 0.14 |
| | | GH730 | 50 ~ 120 | 0.05 - 0.14 |
| M | Stainless steels | GH730 | 50 ~ 120 | 0.05 - 0.14 |
| K | Gray and<br>ductile cast irons | GH730 | 50 ~ 180 | 0.05 - 0.14 |
| N | Aluminium alloys<br>Non-ferrous metals | KS05F | 200 ~ 300 | 0.03 - 0.1 |

# J-SERIES
## JSTTR/L
External threading toolholders






Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *h*2 | Insert |
|---|---|---|---|---|---|---|---|---|
| JSTTR/L1010X3 | 10 | 10 | 120 | 18.5 | 10 | 9.5 | 2 | JTTR/L3... |
| JSTTR/L1212F3 | 12 | 12 | 85 | 18.5 | 12 | 11.5 | - | JTTR/L3... |
| JSTTR/L1212X3 | 12 | 12 | 120 | 18.5 | 12 | 11.5 | - | JTTR/L3... |
| JSTTR/L1616X3 | 16 | 16 | 120 | 18.5 | 16 | 15.5 | - | JTTR/L3... |

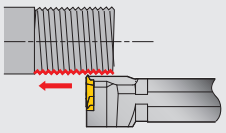
• Recommend clamping torque: 1.2 N·m

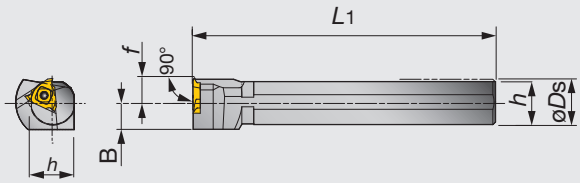
### SPARE PARTS

| Designation | Clamping screw | Wrench | Wrench 1 |
|---|---|---|---|
| JSTTR/L... | CSTB-4SD | T-8F | (T-8L) |

*Optional

# J-SERIES
## JS-TTL3
External threading toolholders






Left hand (L) shown.

| Designation | ø*D*s | *f* | *L*1 | *h* | B | Insert |
|---|---|---|---|---|---|---|
| JS19K-TTL3 | 19.05 | 10 | 125 | 18 | 11.5 | JTTR30... |
| JS20K-TTL3 | 20 | 10 | 125 | 19 | 11.5 | JTTR30... |
| JS22K-TTL3 | 22 | 10 | 125 | 21 | 11.5 | JTTR30... |
| JS25K-TTL3 | 25.4 | 10 | 125 | 24 | 12.7 | JTTR30... |

• Recommend clamping torque: 3.5 N·m

### SPARE PARTS

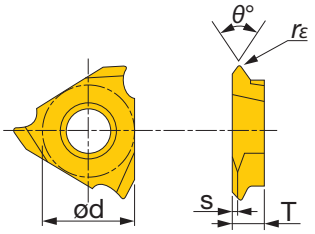
| Designation | Clamping screw | Wrench |
|---|---|---|
| JS**-TTL3 | CSTB-4S | T-15F |

JSTTR/L, JS-TTL3: Inserts → **B373**

## INSERT

### JTT (sharp edge)






Right hand (R) shown.

| Designation | rε | Coating | | | | Cermet | | Uncoated | | θ° | ød | T | s |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | SH725 | | J740 | | NS9530 | | TH10 | | | | | |
| | | R | L | R | L | R | L | R | L | | | | |
| JTTR/L3005F-55 | 0.05 | ● | | ● | | | | | | 55 | 9.525 | 3.18 | 0.6 |
| JTTR/L3005F | 0.05 | ● | ● | ● | | ● | | ● | | 60 | 9.525 | 3.18 | 0.9 |
| JTTR/L3010F | 0.1 | ● | ● | ● | | ● | | ● | | 60 | 9.525 | 3.18 | 0.9 |

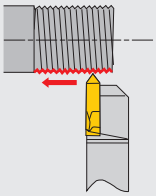
Machinable pitch range: 0.5 to 1 mm

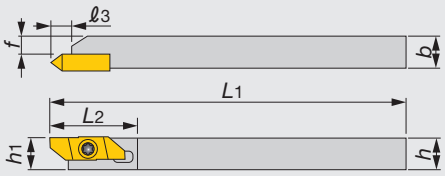
● : Line-up

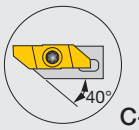
# JSXB R/L

## External threading toolholders








C-type

Right hand (R) shown.

| Designation | h | b | L1 | L2 | ℓ3 | h1 | f | Insert |
|---|---|---|---|---|---|---|---|---|
| JSXBR1010K8-C | 10 | 10 | 125 | 29 | 6.4 | 10 | 5.7 | JXT*R... |
| JSXBR1212K8-C | 12 | 12 | 125 | 29 | 6.4 | 12 | 7.7 | JXT*R... |
| JSXBR1616K8 | 16 | 16 | 125 | 29 | 6.4 | 16 | 11.7 | JXT*R... |
| JSXBR2020K8 | 20 | 20 | 125 | 29 | 6.4 | 20 | 15.7 | JXT*R... |
| JSXBR2525K8 | 25 | 25 | 125 | 29 | 6.4 | 25 | 20.7 | JXT*R... |

- Can be wrenched from back side with both end torx screw.
- This toolholder is compatible with JXB-type inserts and JXT-type inserts.

### SPARE PARTS





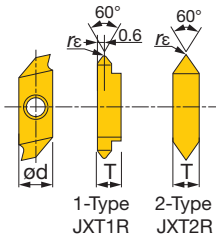
| Designation | Clamping screw | Wrench | Wrench 1 |
|---|---|---|---|
| JSXBR... | CSTB-4SD | T-8F | (T-8L) |

*Optional

## INSERT

### JXT (sharp edge)



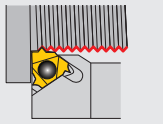


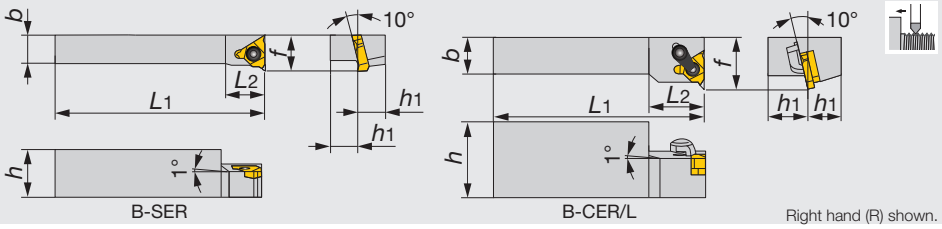

1-Type JXT1R  2-Type JXT2R

| Designation | rε | Coating J740 | Uncoated TH10 | θ° | ød | T |
|---|---|---|---|---|---|---|
| JXT1R6000F | 0.03 | ● | ● | 60 | 8 | 3.97 |
| JXT2R6000F | 0.03 | ● | ● | 60 | 8 | 3.97 |

Machinable pitch range: 0.5 to 1 mm

● : Line-up



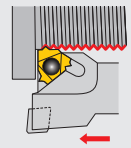


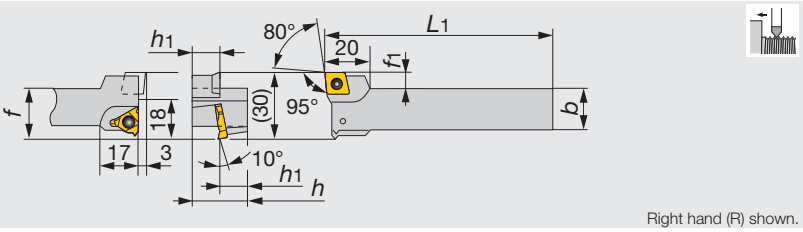

| Designation | h | b | L1 | L2 | h1 | f | Insert |
|---|---|---|---|---|---|---|---|
| B-SER10H16 | 20 | 10 | 100 | 15 | 10 | 16 | 16ER/L... |
| B-SER12K16 | 24 | 12 | 125 | 18 | 12 | 18 | 16ER/L... |
| B-CER/L16M16 | 32 | 16 | 150 | 24 | 16 | 22 | 16ER/L... |

**SPARE PARTS**

| Designation | Clamp set | Shim set | Clamping screw | Wrench |
|---|---|---|---|---|
| B-SER**16 | - | - | CSTB-3.5 | T-15F |
| B-CER/L16M16 | CSP16 | A16-1 | - | T-15F |





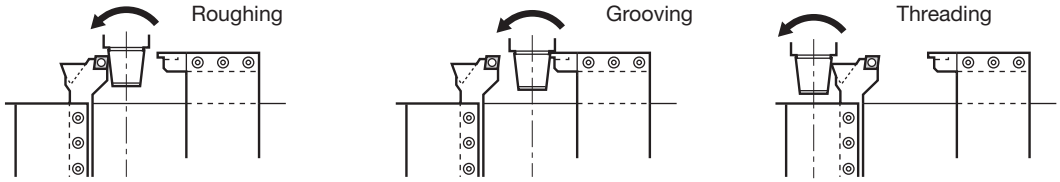



| Designation | h | b | L1 | h1 | f | f1 | Insert |
|---|---|---|---|---|---|---|---|
| BC-SER12K16 | 24 | 16 | 125 | 12 | 23 | 7 | 16ER/L..., CC*T09T3... |

**SPARE PARTS**

| Designation | Clamping screw | Wrench |
|---|---|---|
| BC-SER**16 | CSTB-3.5 | T-15F |

● **Tooling examples using BC-type toolholders**




B-S/CER/L: Inserts → **B384 -**, Standard cutting conditions → **B382**

BC-SER/L: Inserts → **B104 -** (CC*T09T3...), **B384 -** (16ER/L...), PCD → **B177**, Standard cutting conditions → **B382**



TUNGTHREAD

Inserts and toolholders for threading

B384



## Threading Tool for Oil and Gas

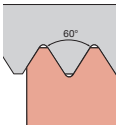
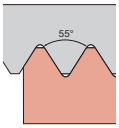
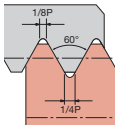
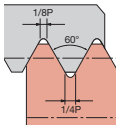
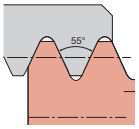
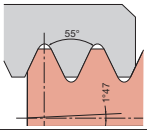
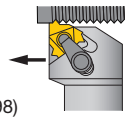
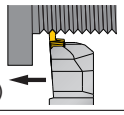
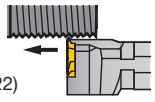
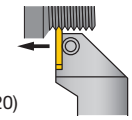
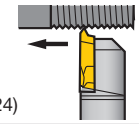
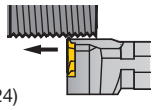
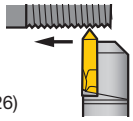
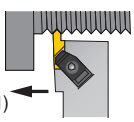
Tool series for threading oil well goods

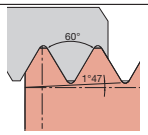
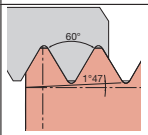
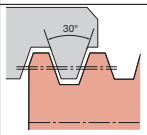
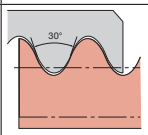
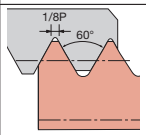
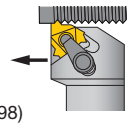
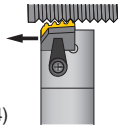
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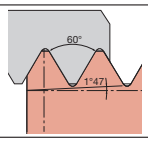
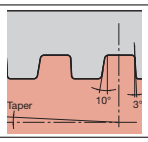
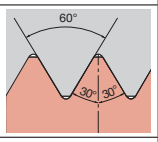
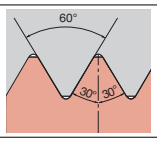
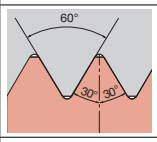
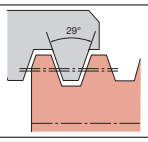
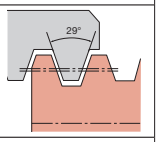
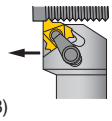
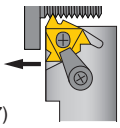
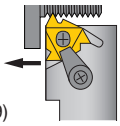
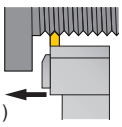
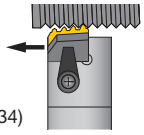

150
1.5

# Applicable tool for each external thread type



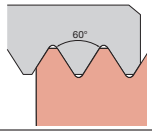
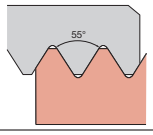
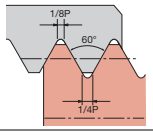
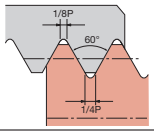
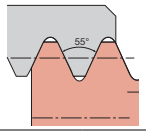
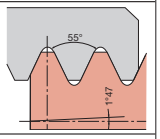
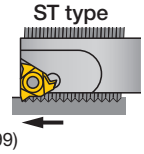
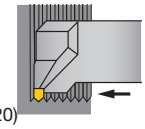
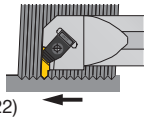
| Thread type | Partial profile | | Full profile | | | | |
|---|---|---|---|---|---|---|---|
| | 60° | 55° | ISO metric | Unified | Whitworth | Parallel pipe thread | Taper pipe thread |
| | - | - | M | UNC, UNF UNEF | BSW, BSF W | G BSP, PF | R, PT, BSPT |
| Tool type \ Thread form |  |  |  |  |  | |  |
| ST type  (B398) | 0.5 ~ 6 mm 48 ~ 4TPI (B384) | 0.5 ~ 5 mm 48 ~ 5TPI (B385) | 0.5 ~ 6 mm (B386) | 32 ~ 5TPI (B388) | 28 ~ 5TPI (B390) | | 28 ~ 11TPI (B391) |
| TETRAMCUT STCR/L-18  (B421) | 0.8 ~ 3 mm 32 ~ 8TPI (B423) | — | — | — | — | | — |
| TETRAMCUT JS-STCL18  (B422) | 0.8 ~ 3 mm 32 ~ 8TPI (B423) | — | — | — | — | | — |
| TT-R/L  (B420) | ~ 3 mm ~ 8TPI (B419) | ~ 3 mm ~ 8TPI (B419) | — | — | — | | — |
| JSTTR/L  (B424) | 0.5 ~ 1 mm 48 ~ 25TPI (B425) | 0.5 ~ 1 mm 48 ~ 25TPI (B425) | — | — | — | | — |
| JS-TTL3  (B424) | 0.5 ~ 1 mm 48 ~ 25TPI (B425) | 0.5 ~ 1 mm 48 ~ 25TPI (B425) | — | — | — | | — |
| JSXBR/L  (B426) | 0.5 ~ 1 mm 48 ~ 25TPI (B426) | — | — | — | — | | — |
| TUNGT-CLAMP  (C021) | 1.27 ~ 4.23 mm 20 ~ 6TPI (C023) | — | — | — | — | | — |

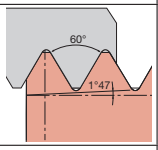
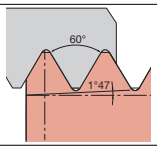
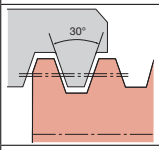
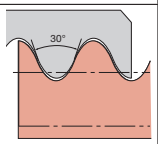
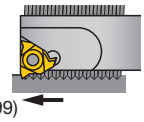
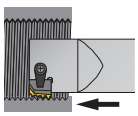
| Thread type | Full profile | | | | | |
|---|---|---|---|---|---|---|
| | National taper pipe | | 30° Trapezoidal | DIN 405 Round | UNJ | |
| | NPT | NPTF | TR | Rd | UNJC,UNJF | |
| Thread form / Tool type |  |  |  |  |  | |
| ST type  (B398) | 27 ~ 8TPI (B392) | 27 ~ 8TPI (B393) | 1.5 ~ 6 mm (B394) | 8TPI, 6TPI (B396) | 32 ~ 8TPI (B396) | |
| Chaser  (B434) | 11.5TPI, 8TPI (B434) | —— | —— | —— | —— | |

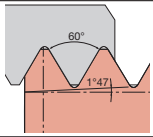
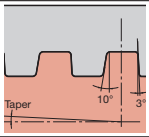
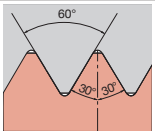
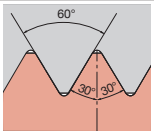
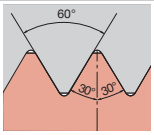
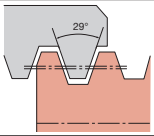
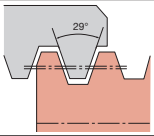
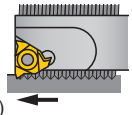
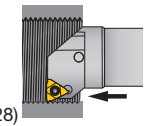
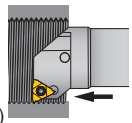
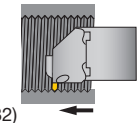
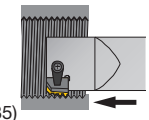
| Thread type | Full profile | | | | | | |
|---|---|---|---|---|---|---|---|
| | API Tubing & Casing | | API Rotary Shoulder Connection | | | ACME | STUB ACME |
| | Round | Buttress | V-0.038R | V-0.040 | V-0.050 | | |
| Thread form / Tool type |  |  |  |  |  |  |  |
| ST type  (B398) | 10TPI, 8TPI (B395) | 5TPI (0.75TPF) (B395) | —— | —— | —— | 12 ~ 5TPI (B394) | —— |
| Lay down (Single side)  (B427) | —— | 5TPI (0.75TPF) 5TPI (1TPF) (B428) | —— | —— | —— | —— | —— |
| Lay down (Double side)  (B429) | —— | —— | 4TPI (2TPF) 4TPI (3TPF) (B430) | 5TPI (3TPF) (B430) | 4TPI (2TPF) 4TPI (3TPF) (B430) | —— | —— |
| On edge  (B431) | 10TPI, 8TPI (B433) | 5TPI (0.75TPF) 5TPI (1TPF) (B433) | —— | —— | —— | 16 ~ 3TPI (B433) | 16 ~ 3TPI (B433) |
| Chaser  (B434) | 10TPI, 8TPI (B434) | 5TPI (0.75TPF) (B434) | —— | —— | —— | —— | —— |

# Applicable tool for each internal thread type



| Thread type | Partial profile | | Full profile | | | | |
|---|---|---|---|---|---|---|---|
| | 60° | 55° | ISO metric | Unified | Whitworth | Parallel pipe thread | Taper pipe thread |
| | - | - | M | UNC, UNF UNEF | BSW, BSF W | G, Rp BSP, PF, PS | Rc, PT, BSPT |
| Thread form / Tool type |  |  |  |  |  | |  |
| ST type  (B399) | 0.5 ~ 6 mm 48 ~ 4TPI (B384) | 0.5 ~ 5 mm 48 ~ 5TPI (B385) | 0.5 ~ 6 mm (B386) | 32 ~ 5TPI (B388) | 28 ~ 5TPI (B390) | | 19 ~ 11TPI (B391) |
| TT-R/L  (B420) | ~ 3 mm ~ 8TPI (B419) | ~ 3 mm ~ 8TPI (B419) | — | — | — | | — |
| TUNGT-CLAMP  (C022) | 2.11 ~ 5.08 mm 12 ~ 5TPI (C023) | — | — | — | — | | — |

| Thread type | Full profile | | | | |
|---|---|---|---|---|---|
| | National taper pipe | | 30° Trapezoidal | DIN 405 Round | |
| | NPT | NPTF | TR | Rd | |
| Thread form / Tool type |  |  |  |  | |
| ST type  (B399) | 27 ~ 8TPI (B392) | 14 ~ 8TPI (B393) | 1.5 ~ 5 mm (B394) | 6TPI (B396) | |
| Chaser  (B435) | 11.5TPI, 8TPI (B435) | — | — | — | |

| Thread type | Full profile | | | | | | |
|---|---|---|---|---|---|---|---|
| | API Tubing & Casing | | API Rotary Shoulder Connection | | | ACME | STUB ACME |
| Thread form / Tool type | Round | Buttress | V-0.038R | V-0.040 | V-0.050 | | |
| |  |  |  |  |  |  |  |
| ST type  (B399) | 10TPI, 8TPI (B395) | 5TPI (0.75TPF) (B395) | — | — | — | 12 ~ 5TPI (B394) | — |
| Lay down (Single side)  (B428) | — | 5TPI (0.75TPF)<br>5TPI (1TPF) (B428) | — | — | — | — | — |
| Lay down (Double side)  (B430) | — | — | 4TPI (2TPF)<br>4TPI (3TPF) (B430) | 5TPI (3TPF) (B430) | 4TPI (2TPF)<br>4TPI (3TPF) (B430) | — | — |
| On edge  (B432) | 10TPI, 8TPI (B433) | 5TPI (0.75TPF)<br>5TPI (1TPF) (B433) | — | — | — | — | — |
| Chaser  (B435) | 10TPI, 8TPI (B435) | 5TPI (0.75TPF) (B435) | — | — | — | — | — |

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Hardness | Cutting speed: *Vc* (m/min) | | | |
|---|---|---|---|---|---|---|
| | | | AH725 | T313V | NS9530 | TH10 |
| P | Carbon steels | < 200HB | 80 - 180 | 100 - 200 | 150 - 200 | - |
| | | > 200HB | 60 - 160 | 100 - 150 | 100 - 170 | - |
| M | Stainless steels | - | 50 - 130 | 70 - 130 | - | - |
| K | Cast irons | - | - | 70 - 150 | - | 70 - 90 |
| N | Non-ferrous metals | - | - | - | - | 100 - 500 |
| S | Heat-resisting alloys | - | - | - | - | 10 - 40 |
| H | Hard materials | 50 ~ 60HRC | - | - | - | 10 - 30 |

## DESIGNATION SYSTEM FOR TAC INSERTS

**16 I R 175 ISO - B**

(1) (2) (3) (4) (5) (6)

**(1) Insert size**

| Symbol | I. C. dia (mm) |
|---|---|
| 06 | - |
| 11 | 6.35 |
| 16 | 9.525 |
| 22 | 12.7 |
| 27 | 15.875 |

**(2) External or Internal**

| | |
|---|---|
| E | External |
| I | Internal |

**(3) Hand of insert**

| | |
|---|---|
| R | Right hand |
| L | Left hand |

**(4) Pitch (TPI)**

| Partial-profile inserts | |
|---|---|
| A | Pitch: 0.5 ~ 1.5 mm<br>TPI: 48 ~ 16 |
| AG | Pitch: 0.5 ~ 3 mm<br>TPI: 48 ~ 8 |
| G | Pitch: 1.75 ~ 3 mm<br>TPI: 14 ~ 8 |
| N | Pitch: 3.5 ~ 5 mm<br>TPI: 7 ~ 5 |
| Z | Pitch: 4 ~ 6 mm<br>TPI: 6 ~ 4 |

**Full-profile inserts**

pitch (mm)×10 or 100
TPI (Thread Per Inch)
(Examples)
05: 0.5 mm pitch×10
175: 1.75 mm pitch×100
14: 14 TPI

**(5) Thread type**

| Partial-profile inserts | |
|---|---|
| 60° | 60° thread angle |
| 55° | 55° thread angle |
| TR | 30° trapezoidal |
| ACME | 29° trapezoidal |
| **Full-profile inserts** | |
| ISO | Metric |
| UN | Unified |
| W | Whitworth |
| PT | Taper pipe |
| NPT | National taper pipe |
| NPTF | National taper pipe |
| RAPI | API round |
| RD | API round |
| BAPI | API buttress |
| RD | Round (DIN405) |
| UNJ | UNJ |

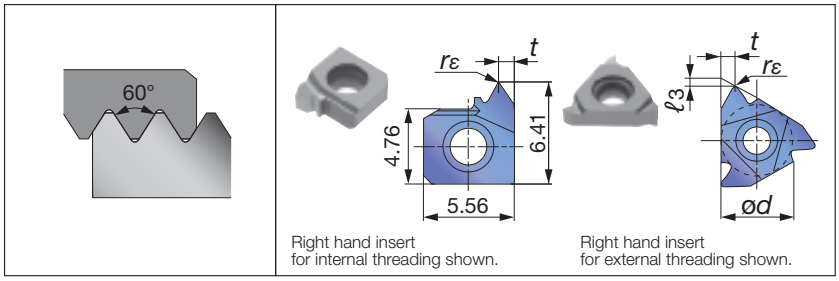
**(6) Chipbreaker**

| | |
|---|---|
| B | With (Basic selection) |
| M | With |
| - | Without |

Note: Please identify new designation system for internal inserts.
**-i.e."N"→"I"**
**(Example) Conventional: 16NR15ISO**
**New: 16IR15ISO**

MEMO

# 60° thread angle




Right hand insert for internal threading shown.

Right hand insert for external threading shown.

## Applicable toolholders

| Insert size | External | Internal |
|---|---|---|
| 6 | | SNR/L000*K06SC...<br>SNR/L000*H06... |
| 11 | | SNR/L**11... |
| 16 | CER/L**16...<br>B-SER/L**16<br>B-CER/L**16<br>BC-SER/L**16 | TSNR/L**16<br>SNR/L**16...<br>TCNR/L**16...<br>CNR/L**16... |
| 22 | CER/L**22... | TSNR/L**22<br>SNR/L**22...<br>TCNR/L**22...<br>CNR/L**22... |
| 27 | CER/L**27... | CNR/L**27... |

## Partial-profile insert

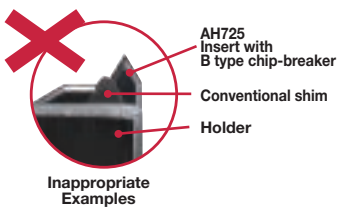
| Insert size | Pitch | TPI | Hand of cut | External insert | | | | | | | | Internal insert | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Designation | Grade | | | ød | t | ℓ3 | rε | Designation | Grade | | | ød | t | ℓ3 | rε |
| | | | | | Coating | | Un-coated | | | | | | Coating | | Un-coated | | | | |
| | | | | | AH725 | T313V | TH10 | | | | | | AH725 | T313V | TH10 | | | | |
| 6 | 0.5~1.5 | 48~16 | R | | | | | | | | | 6IRA60 | ● | | ● | - | 0.9 | - | 0.04 |
| 11 | 0.5~1.5 | 48~16 | R | | | | | | | | | 11IRA60 | ● | ● | ● | 6.35 | 0.9 | 0.7 | 0.04 |
| 11 | 0.5~1.5 | 48~16 | L | | | | | | | | | 11ILA60 | ● | ● | ● | 6.35 | 0.9 | 0.7 | 0.04 |
| 16 | 0.5~1.5 | 48~16 | R | 16ERA60 | ● | ● | ● | 9.525 | 0.9 | 0.7 | 0.06 | 16IRA60 | ● | ● | ● | 9.525 | 0.9 | 0.7 | 0.04 |
| 16 | 0.5~1.5 | 48~16 | L | 16ELA60 | ● | ● | ● | 9.525 | 0.9 | 0.7 | 0.06 | 16ILA60 | ● | ● | ● | 9.525 | 0.9 | 0.7 | 0.04 |
| 16 | 0.5~3 | 48~8 | R | 16ERAG60 | ● | ● | | 9.525 | 1.6 | 1.2 | 0.06 | 16IRAG60 | ● | ● | | 9.525 | 1.6 | 1.2 | 0.04 |
| 16 | 1.75~3 | 14~8 | R | 16ERG60 | ● | ● | ● | 9.525 | 1.6 | 1.2 | 0.22 | 16IRG60 | ● | ● | ● | 9.525 | 1.6 | 1.2 | 0.12 |
| 16 | 1.75~3 | 14~8 | L | 16ELG60 | ● | ● | | 9.525 | 1.6 | 1.2 | 0.22 | 16ILG60 | ● | ● | ● | 9.525 | 1.6 | 1.2 | 0.12 |
| 22 | 3.5~5 | 7~5 | R | 22ERN60 | ● | ● | ● | 12.7 | 2.5 | 1.7 | 0.44 | 22IRN60 | ● | ● | ● | 12.7 | 2.5 | 1.7 | 0.25 |
| 22 | 3.5~5 | 7~5 | L | 22ELN60 | ● | ● | | 12.7 | 2.5 | 1.7 | 0.44 | 22ILN60 | ● | ● | | 12.7 | 2.5 | 1.7 | 0.25 |
| 27 | 4~6 | 6~4 | R | 27ERZ60 | ● | ● | | 15.875 | 3.2 | 2.2 | 0.5 | 27IRZ60 | ● | ● | | 15.875 | 3.2 | 2.2 | 0.28 |

## Partial-profile insert with chipbreaker

| Insert size | Pitch | TPI | Hand of cut | External insert | | | | | | | Internal insert | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Designation | Grade | | ød | t | ℓ3 | rε | Designation | Grade | | ød | t | ℓ3 | rε |
| | | | | | Coating | Cermet | | | | | | Coating | Cermet | | | | |
| | | | | | AH725 | NS9530 | | | | | | AH725 | NS9530 | | | | |
| 11 | 0.5~1.5 | 48~16 | R | | | | | | | | 11IRA60-B | ● | | 6.35 | 0.9 | 0.7 | 0.04 |
| 11 | 0.5~1.5 | 48~16 | R | | | | | | | | 11IRA60-M | | ● | 6.35 | 0.9 | 0.7 | 0.04 |
| 16 | 0.5~1.5 | 48~16 | R | 16ERA60-B | ●* | | 9.525 | 0.9 | 0.8 | 0.05 | 16IRA60-B | ●* | | 9.525 | 0.9 | 0.8 | 0.05 |
| 16 | 0.5~1.5 | 48~16 | R | 16ERA60-M | | ● | 9.525 | 0.9 | 0.7 | 0.06 | 16IRA60-M | | ● | 9.525 | 0.9 | 0.7 | 0.04 |
| 16 | 0.5~3 | 48~8 | R | 16ERAG60-B | ●* | | 9.525 | 1.7 | 1.2 | 0.06 | 16IRAG60-B | ●* | | 9.525 | 1.7 | 1.2 | 0.05 |
| 16 | 0.5~3 | 48~8 | R | 16ERAG60-M | ● | ● | 9.525 | 1.6 | 1.2 | 0.06 | 16IRAG60-M | ● | ● | 9.525 | 1.6 | 1.2 | 0.04 |
| 16 | 1.75~3 | 14~8 | R | 16ERG60-B | ●* | | 9.525 | 1.7 | 1.2 | 0.17 | 16IRG60-B | ●* | | 9.525 | 1.7 | 1.2 | 0.1 |
| 16 | 1.75~3 | 14~8 | R | 16ERG60-M | | ● | 9.525 | 1.6 | 1.2 | 0.22 | 16IRG60-M | | ● | 9.525 | 1.6 | 1.2 | 0.14 |
| 22 | 3.5~5 | 7~5 | R | 22ERN60-B | ●* | | 12.7 | 2.5 | 1.7 | 0.32 | 22IRN60-B | ●* | | 12.7 | 2.5 | 1.7 | 0.19 |

Note: ●* Please be aware of the different dimensions regarding "*t*" & "ℓ3".
Required to modify the position of the cutting edge.
Colored product needs to change the shim.

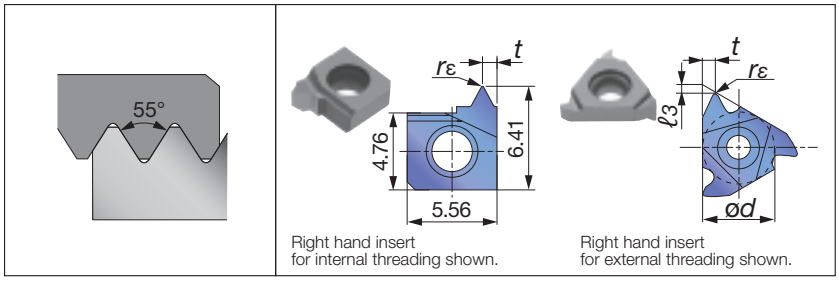
**Please check the items used and replace shims if necessary (see page B397).**




Inappropriate Examples

● : Line-up / Packing Quantity = 5 pcs.

# 55° thread angle




Right hand insert for internal threading shown.

Right hand insert for external threading shown.

## Applicable toolholders

| Insert size | External | Internal |
|---|---|---|
| 6 | | SNR/L000*K06SC...<br>SNR/L000*H06... |
| 11 | | SNR/L**11... |
| 16 | CER/L**16...<br>B-SER/L**16<br>B-CER/L**16<br>BC-SER/L**16 | TSNR/L**16<br>SNR/L**16...<br>TCNR/L**16...<br>CNR/L**16... |
| 22 | CER/L**22... | TSNR/L**22<br>SNR/L**22...<br>TCNR/L**22...<br>CNR/L**22... |

## Partial-profile insert

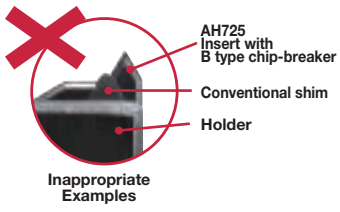
| Insert size | Pitch | TPI | Hand of cut | External insert | | | | | | | | Internal insert | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Designation | Grade | | | ød | t | ℓ3 | rε | Designation | Grade | | | ød | t | ℓ3 | rε |
| | | | | | Coating | | Un-coated | | | | | | Coating | | Un-coated | | | | |
| | | | | | AH725 | T313V | TH10 | | | | | | AH725 | T313V | TH10 | | | | |
| 6 | 0.5~1.5 | 48~16 | R | | | | | | | | | 6IRA55 | ● | | ● | - | 0.9 | - | 0.07 |
| 11 | 0.5~1.5 | 48~16 | R | | | | | | | | | 11IRA55 | ● | ● | ● | 6.35 | 0.9 | 0.7 | 0.07 |
| 16 | 0.5~1.5 | 48~16 | R | 16ERA55 | ● | ● | ● | 9.525 | 0.9 | 0.7 | 0.07 | 16IRA55 | ● | ● | ● | 9.525 | 0.9 | 0.7 | 0.07 |
| 16 | 0.5~3 | 48~8 | R | 16ERAG55 | ● | | | 9.525 | 1.7 | 1.2 | 0.07 | 16IRAG55 | ● | | | 9.525 | 1.7 | 1.2 | 0.07 |
| 16 | 1.75~3 | 14~8 | R | 16ERG55 | ● | ● | ● | 9.525 | 1.6 | 1.2 | 0.25 | 16IRG55 | ● | ● | ● | 9.525 | 1.7 | 1.2 | 0.25 |
| 22 | 3.5~5 | 7~5 | R | 22ERN55 | ● | ● | ● | 12.7 | 2.5 | 1.7 | 0.5 | 22IRN55 | ● | ● | ● | 12.7 | 2.5 | 1.7 | 0.5 |

## Partial-profile insert with chipbreaker

| Insert size | Pitch | TPI | Hand of cut | External insert | | | | | | Internal insert | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Designation | Grade | ød | t | ℓ3 | rε | Designation | Grade | ød | t | ℓ3 | rε |
| | | | | | Coating | | | | | | Coating | | | | |
| | | | | | AH725 | | | | | | AH725 | | | | |
| 16 | 0.5~3 | 48~16 | R | 16ERAG55-B | ●* | 9.525 | 1.7 | 1.2 | 0.07 | 16IRAG55-B | ●* | 9.525 | 1.7 | 1.2 | 0.05 |
| 16 | 1.75~3 | 14~8 | R | 16ERG55-B | ●* | 9.525 | 1.7 | 1.2 | 0.23 | 16IRG55-B | ●* | 9.525 | 1.7 | 1.2 | 0.2 |

Note: ●* Please be aware of the different dimensions regarding "*t*" & "ℓ3".
Required to modify the position of the cutting edge.
Colored product needs to change the shim.

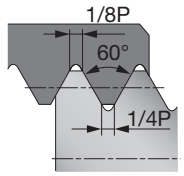
**Please check the items used and replace shims if necessary (see page B397).**

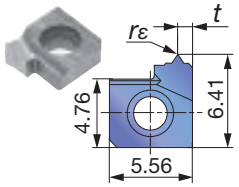



Inappropriate Examples

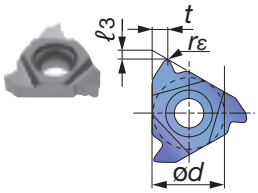
● : Line-up / Packing Quantity = 5 pcs.

# ISO metric




Right hand insert
for internal threading shown.




Right hand insert
for external threading shown.

## Applicable toolholders

| Insert size | External | Internal |
|---|---|---|
| 6 | | SNR/L000*K06SC...<br>SNR/L000*H06... |
| 11 | | SNR/L**11... |
| 16 | CER/L**16...<br>B-SER/L**16<br>B-CER/L**16<br>BC-SER/L**16 | TSNR/L**16<br>SNR/L**16...<br>TCNR/L**16...<br>CNR/L**16... |
| 22 | CER/L**22... | TSNR/L**22<br>SNR/L**22...<br>TCNR/L**22...<br>CNR/L**22... |
| 27 | CER/L**27... | CNR/L**27... |

## Full-profile insert

| Insert size | Pitch | TPI | Hand of cut | External insert: Designation | Grade: Coating AH725 | Coating T313V | Un-coated TH10 | ød | t | ℓ3 | rε | Internal insert: Designation | Grade: Coating AH725 | Coating T313V | Un-coated TH10 | ød | t | ℓ3 | rε |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6 | 0.75 | | R | | | | | | | | | 6IR075ISO | ● | | ● | - | 0.5 | - | 0.05 |
| 6 | 1 | | R | | | | | | | | | 6IR10ISO | ● | | ● | - | 0.9 | - | 0.07 |
| 6 | 1.25 | | R | | | | | | | | | 6IR125ISO | ● | | ● | - | 0.9 | - | 0.09 |
| 6 | 1.5 | | R | | | | | | | | | 6IR15ISO | ● | | ● | - | 0.9 | - | 0.11 |
| 6 | 1.75 | | R | | | | | | | | | 6IR175ISO | ● | | ● | - | 0.9 | - | 0.12 |
| 6 | 2 | | R | | | | | | | | | 6IR20ISO | ● | | ● | - | 0.9 | - | 0.14 |
| 11 | 0.5 | | R | | | | | | | | | 11IR05ISO | ● | | ● | 6.35 | 0.5 | 1.2 | 0.04 |
| 11 | 0.75 | | R | | | | | | | | | 11IR075ISO | ● | | | 6.35 | 0.5 | 1.2 | 0.05 |
| 11 | 1 | | R | | | | | | | | | 11IR10ISO | ● | ● | ● | 6.35 | 0.9 | 0.7 | 0.07 |
| 11 | 1 | | L | | | | | | | | | 11IL10ISO | ● | | | 6.35 | 0.9 | 0.7 | 0.07 |
| 11 | 1.25 | | R | | | | | | | | | 11IR125ISO | ● | | | 6.35 | 0.9 | 0.7 | 0.09 |
| 11 | 1.25 | | L | | | | | | | | | 11IL125ISO | ● | | | 6.35 | 0.9 | 0.7 | 0.09 |
| 11 | 1.5 | | R | | | | | | | | | 11IR15ISO | ● | ● | ● | 6.35 | 0.9 | 0.7 | 0.11 |
| 11 | 1.5 | | L | | | | | | | | | 11IL15ISO | ● | | | 6.35 | 0.9 | 0.7 | 0.11 |
| 11 | 1.75 | | R | | | | | | | | | 11IR175ISO | ● | ● | | 6.35 | 0.9 | 0.7 | 0.12 |
| 11 | 1.75 | | L | | | | | | | | | 11IL175ISO | ● | | | 6.35 | 0.9 | 0.7 | 0.12 |
| 11 | 2 | | R | | | | | | | | | 11IR20ISO | ● | ● | | 6.35 | 0.9 | 0.7 | 0.14 |
| 11 | 2 | | L | | | | | | | | | 11IL20ISO | ● | | | 6.35 | 0.9 | 0.7 | 0.14 |
| 16 | 0.5 | | R | 16ER05ISO | ● | | ● | 9.525 | 0.5 | 1.2 | 0.06 | 16IR05ISO | ● | | | 9.525 | 0.5 | 1.2 | 0.04 |
| 16 | 0.75 | | R | 16ER075ISO | ● | ● | ● | 9.525 | 0.5 | 1.2 | 0.09 | 16IR075ISO | ● | | | 9.525 | 0.5 | 1.2 | 0.05 |
| 16 | 1 | | R | 16ER10ISO | ● | ● | ● | 9.525 | 0.9 | 0.7 | 0.13 | 16IR10ISO | ● | ● | ● | 9.525 | 0.9 | 0.7 | 0.07 |
| 16 | 1 | | L | 16EL10ISO | | | | 9.525 | 0.9 | 0.7 | 0.13 | 16IL10ISO | ● | | | 9.525 | 0.9 | 0.7 | 0.07 |
| 16 | 1.25 | | R | 16ER125ISO | ● | ● | | 9.525 | 0.9 | 0.7 | 0.16 | 16IR125ISO | ● | | | 9.525 | 0.9 | 0.7 | 0.09 |
| 16 | 1.25 | | L | 16EL125ISO | | | | 9.525 | 0.9 | 0.7 | 0.16 | 16IL125ISO | ● | | | 9.525 | 0.9 | 0.7 | 0.09 |
| 16 | 1.5 | | R | 16ER15ISO | ● | ● | ● | 9.525 | 0.9 | 0.7 | 0.19 | 16IR15ISO | ● | ● | ● | 9.525 | 0.9 | 0.7 | 0.11 |
| 16 | 1.5 | | L | 16EL15ISO | | | | 9.525 | 0.9 | 0.7 | 0.19 | 16IL15ISO | ● | | | 9.525 | 0.9 | 0.7 | 0.11 |
| 16 | 1.75 | | R | 16ER175ISO | ● | ● | | 9.525 | 1.6 | 1.2 | 0.22 | 16IR175ISO | ● | ● | | 9.525 | 1.6 | 1.2 | 0.12 |
| 16 | 2 | | R | 16ER20ISO | ● | ● | ● | 9.525 | 1.6 | 1.2 | 0.25 | 16IR20ISO | ● | ● | ● | 9.525 | 1.6 | 1.2 | 0.14 |
| 16 | 2 | | L | 16EL20ISO | ● | | | 9.525 | 1.6 | 1.2 | 0.25 | 16IL20ISO | ● | | | 9.525 | 1.6 | 1.2 | 0.14 |
| 16 | 2.5 | | R | 16ER25ISO | ● | ● | ● | 9.525 | 1.6 | 1.2 | 0.31 | 16IR25ISO | ● | ● | ● | 9.525 | 1.6 | 1.2 | 0.18 |
| 16 | 3 | | R | 16ER30ISO | ● | ● | ● | 9.525 | 1.6 | 1.2 | 0.38 | 16IR30ISO | ● | ● | ● | 9.525 | 1.6 | 1.2 | 0.21 |
| 16 | 3 | | L | 16EL30ISO | | | | 9.525 | 1.6 | 1.2 | 0.38 | 16IL30ISO | ● | | | 9.525 | 1.6 | 1.2 | 0.21 |

● : Line-up / Packing Quantity = 5 pcs.

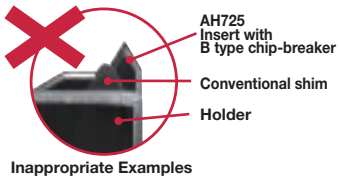
| Insert size | Pitch | TPI | Hand of cut | External insert: Designation | Grade: Coating AH725 | Grade: Coating T313V | Grade: Uncoated TH10 | ød | t | ℓ3 | rε | Internal insert: Designation | Grade: Coating AH725 | Grade: Coating T313V | Grade: Uncoated TH10 | ød | t | ℓ3 | rε |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 22 | 3.5 | | R | 22ER35ISO | ● | ● | | 12.7 | 2.5 | 1.7 | 0.44 | 22IR35ISO | ● | ● | | 12.7 | 2.5 | 1.7 | 0.25 |
| 22 | 4 | | R | 22ER40ISO | ● | ● | | 12.7 | 2.5 | 1.7 | 0.5 | 22IR40ISO | ● | ● | | 12.7 | 2.5 | 1.7 | 0.28 |
| 22 | 4.5 | | R | 22ER45ISO | ● | | | 12.7 | 2.5 | 1.7 | 0.56 | 22IR45ISO | ● | | | 12.7 | 2.5 | 1.7 | 0.32 |
| 22 | 5 | | R | 22ER50ISO | ● | ● | | 12.7 | 2.5 | 1.7 | 0.63 | 22IR50ISO | ● | ● | | 12.7 | 2.5 | 1.7 | 0.35 |
| 27 | 6 | | R | 27ER60ISO | ● | ● | | 15.875 | 3.2 | 2.2 | 0.75 | 27IR60ISO | ● | ● | | 15.875 | 3.2 | 2.2 | 0.42 |

## Full-profile insert with chipbreaker

| Insert size | Pitch | TPI | Hand of cut | External insert: Designation | Grade: Coating AH725 | Grade: Cermet NS9530 | ød | t | ℓ3 | rε | Internal insert: Designation | Grade: Coating AH725 | Grade: Cermet NS9530 | ød | t | ℓ3 | rε |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11 | 0.5 | | R | | | | | | | | 11IR05ISO-B | ● | | 6.35 | 0.5 | 1.2 | 0.04 |
| 11 | 0.5 | | R | | | | | | | | 11IR05ISO-M | | ● | 6.35 | 0.5 | 1.2 | 0.04 |
| 11 | 0.75 | | R | | | | | | | | 11IR075ISO-B | ● | | 6.35 | 0.5 | 1.2 | 0.05 |
| 11 | 0.75 | | R | | | | | | | | 11IR075ISO-M | | ● | 6.35 | 0.5 | 1.2 | 0.05 |
| 11 | 1 | | R | | | | | | | | 11IR10ISO-B | ● | | 6.35 | 0.9 | 0.7 | 0.08 |
| 11 | 1 | | R | | | | | | | | 11IR10ISO-M | | ● | 6.35 | 0.9 | 0.7 | 0.08 |
| 11 | 1.25 | | R | | | | | | | | 11IR125ISO-B | ● | | 6.35 | 0.9 | 0.7 | 0.1 |
| 11 | 1.25 | | R | | | | | | | | 11IR125ISO-M | | ● | 6.35 | 0.9 | 0.7 | 0.1 |
| 11 | 1.5 | | R | | | | | | | | 11IR15ISO-B | ● | | 6.35 | 0.9 | 0.7 | 0.12 |
| 11 | 1.5 | | R | | | | | | | | 11IR15ISO-M | | ● | 6.35 | 0.9 | 0.7 | 0.12 |
| 11 | 1.75 | | R | | | | | | | | 11IR175ISO-B | ● | | 6.35 | 0.9 | 0.7 | 0.12 |
| 11 | 1.75 | | R | | | | | | | | 11IR175ISO-M | | ● | 6.35 | 0.9 | 0.7 | 0.12 |
| 11 | 2 | | R | | | | | | | | 11IR20ISO-B | ● | | 6.35 | 0.9 | 0.7 | 0.14 |
| 11 | 2 | | R | | | | | | | | 11IR20ISO-M | | ● | 6.35 | 0.9 | 0.7 | 0.14 |
| 16 | 0.5 | | R | 16ER05ISO-M | | ● | 9.525 | 0.5 | 1.2 | 0.06 | | | | | | | |
| 16 | 0.75 | | R | 16ER075ISO-B | ●* | | 9.525 | 0.6 | 0.6 | 0.08 | | | | | | | |
| 16 | 0.75 | | R | 16ER075ISO-M | | ● | 9.525 | 0.5 | 1.2 | 0.09 | | | | | | | |
| 16 | 1 | | R | 16ER10ISO-B | ●* | | 9.525 | 0.7 | 0.7 | 0.11 | 16IR10ISO-B | ●* | | 9.525 | 0.7 | 0.6 | 0.05 |
| 16 | 1 | | R | 16ER10ISO-M | ● | ● | 9.525 | 0.9 | 0.7 | 0.13 | 16IR10ISO-M | | ● | 9.525 | 0.9 | 0.7 | 0.08 |
| 16 | 1.25 | | R | 16ER125ISO-B | ●* | | 9.525 | 0.9 | 0.8 | 0.14 | 16IR125ISO-B | ●* | | 9.525 | 0.9 | 0.8 | 0.07 |
| 16 | 1.25 | | R | 16ER125ISO-M | | ● | 9.525 | 0.9 | 0.7 | 0.16 | 16IR125ISO-M | | ● | 9.525 | 0.9 | 0.7 | 0.1 |
| 16 | 1.5 | | R | 16ER15ISO-B | ●* | | 9.525 | 1 | 0.8 | 0.19 | 16IR15ISO-B | ●* | | 9.525 | 1 | 0.8 | 0.08 |
| 16 | 1.5 | | R | 16ER15ISO-M | ● | ● | 9.525 | 0.9 | 0.7 | 0.19 | 16IR15ISO-M | ● | ● | 9.525 | 0.9 | 0.7 | 0.12 |
| 16 | 1.75 | | R | 16ER175ISO-B | ●* | | 9.525 | 1.2 | 0.9 | 0.2 | 16IR175ISO-B | ●* | | 9.525 | 1.2 | 0.9 | 0.10 |
| 16 | 1.75 | | R | 16ER175ISO-M | | ● | 9.525 | 1.6 | 1.2 | 0.22 | 16IR175ISO-M | | ● | 9.525 | 1.6 | 1.2 | 0.14 |
| 16 | 2 | | R | 16ER20ISO-B | ●* | | 9.525 | 1.3 | 1 | 0.24 | 16IR20ISO-B | ●* | | 9.525 | 1.3 | 1 | 0.11 |
| 16 | 2 | | R | 16ER20ISO-M | ● | ● | 9.525 | 1.6 | 1.2 | 0.25 | 16IR20ISO-M | | ● | 9.525 | 1.6 | 1.2 | 0.14 |
| 16 | 2.5 | | R | 16ER25ISO-B | ●* | | 9.525 | 1.5 | 1.1 | 0.3 | 16IR25ISO-B | ●* | | 9.525 | 1.5 | 1.1 | 0.14 |
| 16 | 2.5 | | R | 16ER25ISO-M | | ● | 9.525 | 1.6 | 1.2 | 0.31 | 16IR25ISO-M | | ● | 9.525 | 1.6 | 1.2 | 0.18 |
| 16 | 3 | | R | 16ER30ISO-B | ●* | | 9.525 | 1.6 | 1.2 | 0.38 | 16IR30ISO-B | ●* | | 9.525 | 1.5 | 1.1 | 0.18 |
| 16 | 3 | | R | 16ER30ISO-M | | ● | 9.525 | 1.6 | 1.2 | 0.38 | 16IR30ISO-M | | ● | 9.525 | 1.6 | 1.2 | 0.21 |
| 22 | 3.5 | | R | 22ER35ISO-B | ●* | | 12.7 | 2.3 | 1.6 | 0.48 | | | | | | | |
| 22 | 4 | | R | 22ER40ISO-B | ●* | | 12.7 | 2.3 | 1.6 | 0.52 | | | | | | | |

Note: ●* Please be aware of the different dimensions regarding "*t*" & "ℓ3".
Required to modify the position of the cutting edge.
Colored product needs to change the shim.

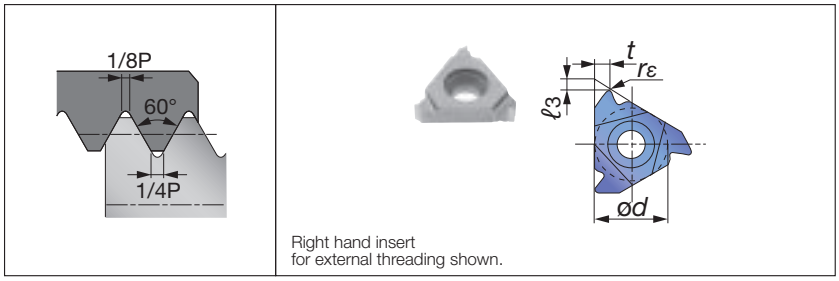
**Please check the items used and replace shims if necessary(see page B397).**



Inappropriate Examples

● : Line-up / Packing Quantity = 5 pcs.

# Unified




Right hand insert
for external threading shown.

## Applicable toolholders

| Insert size | External | Internal |
|---|---|---|
| 11 | | SNR/L**11... |
| 16 | CER/L**16...<br>B-SER/L**16<br>B-CER/L**16<br>BC-SER/L**16 | TSNR/L**16<br>SNR/L**16...<br>TCNR/L**16...<br>CNR/L**16... |
| 22 | CER/L**22... | TSNR/L**22<br>SNR/L**22...<br>TCNR/L**22...<br>CNR/L**22... |

## Full-profile insert

| Insert size | Pitch (Reference) | TPI | Hand of cut | External insert: Designation | Grade: Coating: AH725 | Grade: Coating: T313V | ød | t | ℓ3 | rε | Internal insert: Designation | Grade: Coating: AH725 | Grade: Coating: T313V | ød | t | ℓ3 | rε |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11 | (0.794) | 32 | R | | | | | | | | 11IR32UN | ● | | 6.35 | 0.5 | 1.2 | 0.06 |
| 11 | (0.907) | 28 | R | | | | | | | | 11IR28UN | ● | | 6.35 | 0.5 | 1.2 | 0.06 |
| 11 | (1.058) | 24 | R | | | | | | | | 11IR24UN | ● | | 6.35 | 0.9 | 0.7 | 0.07 |
| 11 | (1.27) | 20 | R | | | | | | | | 11IR20UN | ● | | 6.35 | 0.9 | 0.7 | 0.09 |
| 11 | (1.411) | 18 | R | | | | | | | | 11IR18UN | ● | | 6.35 | 0.9 | 0.7 | 0.1 |
| 11 | (1.588) | 16 | R | | | | | | | | 11IR16UN | ● | | 6.35 | 0.9 | 0.7 | 0.11 |
| 11 | (1.814) | 14 | R | | | | | | | | 11IR14UN | ● | | 6.35 | 0.9 | 0.7 | 0.13 |
| 16 | (0.794) | 32 | R | 16ER32UN | ● | | 9.525 | 0.5 | 1.2 | 0.1 | 16IR32UN | ● | | 9.525 | 0.5 | 1.2 | 0.06 |
| 16 | (0.907) | 28 | R | 16ER28UN | ● | | 9.525 | 0.5 | 1.2 | 0.11 | 16IR28UN | ● | | 9.525 | 0.5 | 1.2 | 0.06 |
| 16 | (1.058) | 24 | R | 16ER24UN | ● | | 9.525 | 0.9 | 0.7 | 0.13 | 16IR24UN | ● | | 9.525 | 0.9 | 0.7 | 0.07 |
| 16 | (1.27) | 20 | R | 16ER20UN | ● | | 9.525 | 0.9 | 0.7 | 0.16 | 16IR20UN | ● | | 9.525 | 0.9 | 0.7 | 0.09 |
| 16 | (1.411) | 18 | R | 16ER18UN | ● | | 9.525 | 0.9 | 0.7 | 0.18 | 16IR18UN | ● | | 9.525 | 0.9 | 0.7 | 0.1 |
| 16 | (1.588) | 16 | R | 16ER16UN | ● | ● | 9.525 | 0.9 | 0.7 | 0.2 | 16IR16UN | ● | ● | 9.525 | 0.9 | 0.7 | 0.11 |
| 16 | (1.814) | 14 | R | 16ER14UN | ● | ● | 9.525 | 1.6 | 1.2 | 0.23 | 16IR14UN | ● | ● | 9.525 | 1.6 | 1.2 | 0.13 |
| 16 | (1.954) | 13 | R | 16ER13UN | ● | | 9.525 | 1.6 | 1.2 | 0.24 | 16IR13UN | ● | | 9.525 | 1.6 | 1.2 | 0.14 |
| 16 | (2.117) | 12 | R | 16ER12UN | ● | ● | 9.525 | 1.6 | 1.2 | 0.27 | 16IR12UN | ● | ● | 9.525 | 1.6 | 1.2 | 0.15 |
| 16 | (2.309) | 11 | R | 16ER11UN | ● | | 9.525 | 1.6 | 1.2 | 0.29 | 16IR11UN | ● | | 9.525 | 1.6 | 1.2 | 0.16 |
| 16 | (2.54) | 10 | R | 16ER10UN | ● | | 9.525 | 1.6 | 1.2 | 0.32 | 16IR10UN | ● | | 9.525 | 1.6 | 1.2 | 0.18 |
| 16 | (2.822) | 9 | R | 16ER9UN | ● | | 9.525 | 1.6 | 1.2 | 0.35 | 16IR9UN | ● | | 9.525 | 1.6 | 1.2 | 0.2 |
| 16 | (3.175) | 8 | R | 16ER8UN | ● | ● | 9.525 | 1.6 | 1.2 | 0.4 | 16IR8UN | ● | ● | 9.525 | 1.6 | 1.2 | 0.22 |
| 22 | (3.629) | 7 | R | 22ER7UN | ● | | 12.7 | 2.5 | 1.7 | 0.45 | 22IR7UN | ● | | 12.7 | 2.5 | 1.7 | 0.25 |
| 22 | (4.233) | 6 | R | 22ER6UN | ● | | 12.7 | 2.5 | 1.7 | 0.53 | 22IR6UN | ● | | 12.7 | 2.5 | 1.7 | 0.3 |
| 22 | (5.08) | 5 | R | 22ER5UN | ● | | 12.7 | 2.5 | 1.7 | 0.64 | 22IR5UN | ● | | 12.7 | 2.5 | 1.7 | 0.36 |

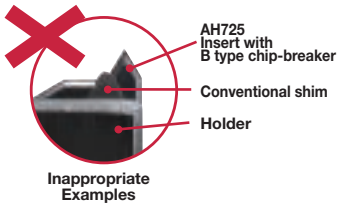
● : Line-up / Packing Quantity = 5 pcs.

## Full-profile insert with chipbreaker

| Insert size | Pitch | TPI | Hand of cut | External insert | | | | | | | Internal insert | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Designation | Grade | | ød | t | $\ell_3$ | rε | Designation | Grade | | ød | t | $\ell_3$ | rε |
| | | | | | Coating AH725 | Cermet NS9530 | | | | | | Coating AH725 | Cermet NS9530 | | | | |
| 16 | | 24 | R | **16ER24UN-B** | ●* | | 9.525 | 0.8 | 0.7 | 0.11 | | | | | | | |
| 16 | | 24 | R | **16ER24UN-M** | | ● | 9.525 | 0.9 | 0.7 | 0.13 | | | | | | | |
| 16 | | 20 | R | **16ER20UN-B** | ●* | | 9.525 | 0.9 | 0.8 | 0.14 | **16IR20UN-B** | ●* | | 9.525 | 0.9 | 0.8 | 0.06 |
| 16 | | 20 | R | **16ER20UN-M** | | ● | 9.525 | 0.9 | 0.7 | 0.16 | **16IR20UN-M** | | ● | 9.525 | 0.9 | 0.7 | 0.09 |
| 16 | | 18 | R | **16ER18UN-B** | ●* | | 9.525 | 1 | 0.8 | 0.15 | **16IR18UN-B** | ●* | | 9.525 | 1 | 0.8 | 0.08 |
| 16 | | 18 | R | **16ER18UN-M** | | ● | 9.525 | 0.9 | 0.7 | 0.18 | **16IR18UN-M** | | ● | 9.525 | 0.9 | 0.7 | 0.1 |
| 16 | | 16 | R | **16ER16UN-B** | ●* | | 9.525 | 1.1 | 0.9 | 0.19 | **16IR16UN-B** | ●* | | 9.525 | 1.1 | 0.9 | 0.09 |
| 16 | | 16 | R | **16ER16UN-M** | | ● | 9.525 | 0.9 | 0.7 | 0.2 | **16IR16UN-M** | | ● | 9.525 | 0.9 | 0.7 | 0.11 |
| 16 | | 14 | R | **16ER14UN-B** | ●* | | 9.525 | 1.2 | 1 | 0.22 | **16IR14UN-B** | ●* | | 9.525 | 1.2 | 0.9 | 0.11 |
| 16 | | 14 | R | **16ER14UN-M** | | ● | 9.525 | 1.6 | 1.2 | 0.23 | **16IR14UN-M** | | ● | 9.525 | 1.6 | 1.2 | 0.13 |
| 16 | | 13 | R | **16ER13UN-B** | ●* | | 9.525 | 1.3 | 1 | 0.24 | | | | | | | |
| 16 | | 12 | R | **16ER12UN-B** | ●* | | 9.525 | 1.4 | 1.1 | 0.25 | **16IR12UN-B** | ●* | | 9.525 | 1.4 | 1.1 | 0.12 |
| 16 | | 12 | R | **16ER12UN-M** | | ● | 9.525 | 1.6 | 1.2 | 0.27 | **16IR12UN-M** | | ● | 9.525 | 1.6 | 1.2 | 0.15 |
| 16 | | 8 | R | **16ER8UN-B** | ●* | | 9.525 | 1.6 | 1.2 | 0.41 | **16IR8UN-B** | ●* | | 9.525 | 1.5 | 1.1 | 0.19 |
| 16 | | 8 | R | **16ER8UN-M** | | ● | 9.525 | 1.6 | 1.2 | 0.4 | **16IR8UN-M** | | ● | 9.525 | 1.6 | 1.2 | 0.22 |

Note: ●* Please be aware of the different dimensions regarding "*t*" & "$\ell_3$".
Required to modify the position of the cutting edge.
Colored product needs to change the shim.

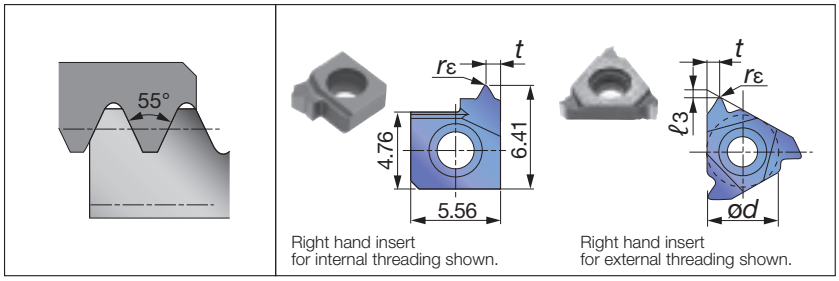
**Please check the items used and replace shims if necessary (see page B397).**



Inappropriate Examples

● : Line-up / Packing Quantity = 5 pcs.

# Whitworth




Right hand insert for internal threading shown.

Right hand insert for external threading shown.

## Applicable toolholders

| Insert size | External | Internal |
|---|---|---|
| 6 | | SNR/L000*K06SC...<br>SNR/L000*H06... |
| 11 | | SNR/L**11... |
| 16 | CER/L**16...<br>B-SER/L**16<br>B-CER/L**16<br>BC-SER/L**16 | TSNR/L**16<br>SNR/L**16...<br>TCNR/L**16...<br>CNR/L**16... |
| 22 | CER/L**22... | TSNR/L**22<br>SNR/L**22...<br>TCNR/L**22...<br>CNR/L**22... |

## Full-profile insert

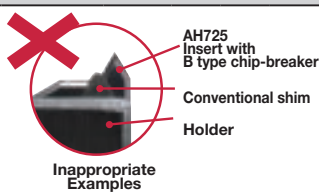
| Insert size | Pitch (Reference) | TPI | Hand of cut | External insert: Designation | Grade: Coating AH725 | Grade: Coating T313V | Grade: Uncoated TH10 | ød | t | ℓ3 | rε | Internal insert: Designation | Grade: Coating AH725 | Grade: Coating T313V | Grade: Uncoated TH10 | ød | t | ℓ3 | rε |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6 | (1.337) | 19 | R | | | | | | | | | 6IR19W | ● | | ● | - | 0.9 | - | 0.17 |
| 11 | (1.337) | 19 | R | | | | | | | | | 11IR19W | ● | ● | ● | 6.35 | 0.9 | 0.7 | 0.17 |
| 11 | (1.814) | 14 | R | | | | | | | | | 11IR14W | ● | ● | ● | 6.35 | 0.9 | 0.7 | 0.23 |
| 16 | (0.907) | 28 | R | 16ER28W | ● | ● | | 9.525 | 0.9 | 0.7 | 0.11 | 16IR28W | ● | | | 9.525 | 0.9 | 0.7 | 0.11 |
| 16 | (0.97) | 26 | R | 16ER26W | ● | | | 9.525 | 0.9 | 0.7 | 0.12 | 16IR26W | ● | | | 9.525 | 0.9 | 0.7 | 0.12 |
| 16 | (1.27) | 20 | R | 16ER20W | ● | | | 9.525 | 0.9 | 0.7 | 0.16 | 16IR20W | ● | | | 9.525 | 0.9 | 0.7 | 0.16 |
| 16 | (1.337) | 19 | R | 16ER19W | ● | ● | | 9.525 | 0.9 | 0.7 | 0.17 | 16IR19W | ● | | | 9.525 | 0.9 | 0.7 | 0.17 |
| 16 | (1.411) | 18 | R | 16ER18W | ● | | | 9.525 | 0.9 | 0.7 | 0.18 | 16IR18W | ● | | | 9.525 | 0.9 | 0.7 | 0.18 |
| 16 | (1.588) | 16 | R | 16ER16W | ● | ● | | 9.525 | 0.9 | 0.7 | 0.2 | 16IR16W | ● | ● | | 9.525 | 0.9 | 0.7 | 0.2 |
| 16 | (1.814) | 14 | R | 16ER14W | ● | ● | ● | 9.525 | 1.6 | 1.2 | 0.23 | 16IR14W | ● | ● | ● | 9.525 | 1.6 | 1.2 | 0.23 |
| 16 | (1.814) | 14 | L | 16EL14W | ● | | | 9.525 | 1.6 | 1.2 | 0.23 | | | | | | | | |
| 16 | (2.117) | 12 | R | 16ER12W | ● | ● | | 9.525 | 1.6 | 1.2 | 0.27 | 16IR12W | ● | ● | | 9.525 | 1.6 | 1.2 | 0.27 |
| 16 | (2.309) | 11 | R | 16ER11W | ● | ● | ● | 9.525 | 1.6 | 1.2 | 0.29 | 16IR11W | ● | ● | ● | 9.525 | 1.6 | 1.2 | 0.29 |
| 16 | (2.54) | 10 | R | 16ER10W | ● | ● | | 9.525 | 1.6 | 1.2 | 0.32 | 16IR10W | ● | ● | | 9.525 | 1.6 | 1.2 | 0.32 |
| 16 | (2.822) | 9 | R | 16ER9W | ● | | | 9.525 | 1.6 | 1.2 | 0.35 | 16IR9W | ● | | | 9.525 | 1.6 | 1.2 | 0.35 |
| 16 | (3.175) | 8 | R | 16ER8W | ● | ● | | 9.525 | 1.6 | 1.2 | 0.4 | 16IR8W | ● | ● | | 9.525 | 1.6 | 1.2 | 0.4 |
| 22 | (3.629) | 7 | R | 22ER7W | ● | | | 12.7 | 2.5 | 1.7 | 0.45 | 22IR7W | ● | | | 12.7 | 2.5 | 1.7 | 0.45 |
| 22 | (4.233) | 6 | R | 22ER6W | ● | | | 12.7 | 2.5 | 1.7 | 0.53 | 22IR6W | ● | | | 12.7 | 2.5 | 1.7 | 0.53 |
| 22 | (5.08) | 5 | R | 22ER5W | ● | | | 12.7 | 2.5 | 1.7 | 0.64 | 22IR5W | ● | | | 12.7 | 2.5 | 1.7 | 0.64 |

## Full-profile insert with chipbreaker

| Insert size | Pitch (Reference) | TPI | Hand of cut | External insert: Designation | Grade: Coating AH725 | Grade: Cermet NS9530 | ød | t | ℓ3 | rε | Internal insert: Designation | Grade: Coating AH725 | Grade: Cermet NS9530 | ød | t | ℓ3 | rε |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | (1.337) | 19 | R | 16ER19W-B | ●* | | 9.525 | 1 | 0.8 | 0.16 | | | | | | | |
| 16 | (1.337) | 19 | R | 16ER19W-M | | ● | 9.525 | 0.9 | 0.7 | 0.17 | 16IR19W-M | | ● | 9.525 | 0.9 | 0.7 | 0.17 |
| 16 | (1.588) | 16 | R | 16ER16W-B | ●* | | 9.525 | 1.1 | 0.9 | 0.2 | 16IR16W-B | ●* | | 9.525 | 1.1 | 0.9 | 0.18 |
| 16 | (1.814) | 14 | R | 16ER14W-B | ●* | | 9.525 | 1.2 | 1 | 0.24 | 16IR14W-B | ●* | | 9.525 | 1.2 | 1 | 0.21 |
| 16 | (1.814) | 14 | R | 16ER14W-M | | ● | 9.525 | 1.6 | 1.2 | 0.23 | 16IR14W-M | | ● | 9.525 | 1.6 | 1.2 | 0.23 |
| 16 | (2.309) | 11 | R | 16ER11W-B | ●* | | 9.525 | 1.5 | 1.1 | 0.27 | 16IR11W-B | ●* | | 9.525 | 1.5 | 1.1 | 0.27 |
| 16 | (2.309) | 11 | R | 16ER11W-M | | ● | 9.525 | 1.6 | 1.2 | 0.29 | 16IR11W-M | | ● | 9.525 | 1.6 | 1.2 | 0.29 |

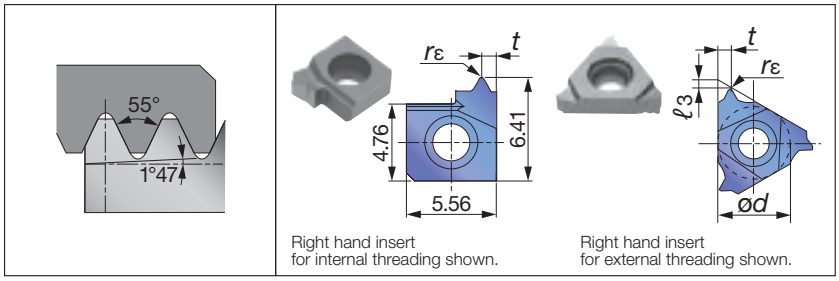
Note: ●* Please be aware of the different dimensions regarding "*t*" & "ℓ3".
Required to modify the position of the cutting edge.
Colored product needs to change the shim.

**Please check the items used and replace shims if necessary (see page B397).**




● : Line-up / Packing Quantity = 5 pcs.

# Taper pipe




Right hand insert for internal threading shown.

Right hand insert for external threading shown.

## Applicable toolholders

| Insert size | External | Internal |
|---|---|---|
| 6 | | SNR/L000*K06SC...<br>SNR/L000*H06... |
| 11 | | SNR/L**11... |
| 16 | CER/L**16...<br>B-SER/L**16<br>B-CER/L**16<br>BC-SER/L**16 | TSNR/L**16<br>SNR/L**16...<br>TCNR/L**16...<br>CNR/L**16... |



## Full-profile insert

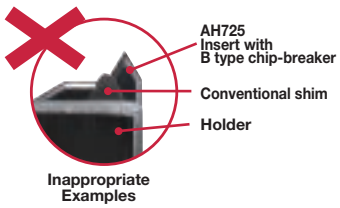
| Insert size | Pitch (Reference) | TPI | Hand of cut | External insert: Designation | Grade: Coating AH725 | Grade: Coating T313V | Grade: Un-coated TH10 | ød | t | ℓ3 | rε | Internal insert: Designation | Grade: Coating AH725 | Grade: Coating T313V | Grade: Un-coated TH10 | ød | t | ℓ3 | rε |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6 | (1.337) | 19 | R | | | | | | | | | 6IR19PT | ● | | ● | - | 0.9 | - | 0.14 |
| 11 | (1.337) | 19 | R | | | | | | | | | 11IR19PT | ● | ● | ● | 6.35 | 0.9 | 0.7 | 0.14 |
| 11 | (1.814) | 14 | R | | | | | | | | | 11IR14PT | ● | ● | ● | 6.35 | 0.9 | 0.7 | 0.16 |
| 16 | (0.907) | 28 | R | 16ER28PT | ● | ● | | 9.525 | 0.9 | 0.7 | 0.09 | | | | | | | | |
| 16 | (1.337) | 19 | R | 16ER19PT | ● | ● | | 9.525 | 0.9 | 0.7 | 0.14 | 16IR19PT | ● | | | 9.525 | 0.9 | 0.7 | 0.14 |
| 16 | (1.814) | 14 | R | 16ER14PT | ● | ● | | 9.525 | 1.6 | 1.2 | 0.16 | 16IR14PT | ● | ● | ● | 9.525 | 1.6 | 1.2 | 0.16 |
| 16 | (2.309) | 11 | R | 16ER11PT | ● | ● | | 9.525 | 1.6 | 1.2 | 0.26 | 16IR11PT | ● | ● | ● | 9.525 | 1.6 | 1.2 | 0.26 |

## Full-profile insert with chipbreaker

| Insert size | Pitch (Reference) | TPI | Hand of cut | External insert: Designation | Grade: Coating AH725 | Grade: Cermet NS9530 | ød | t | ℓ3 | rε | Internal insert: Designation | Grade: Coating AH725 | Grade: Cermet NS9530 | ød | t | ℓ3 | rε |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | (1.337) | 19 | R | 16ER19PT-M | | ● | 9.525 | 0.9 | 0.7 | 0.18 | 16IR19PT-M | | ● | 9.525 | 0.9 | 0.7 | 0.18 |
| 16 | (1.814) | 14 | R | 16ER14PT-B | ●* | | 9.525 | 1.2 | 1 | 0.21 | 16IR14PT-B | ●* | | 9.525 | 1 | 1.2 | 0.21 |
| 16 | (1.814) | 14 | R | 16ER14PT-M | | ● | 9.525 | 1.6 | 1.2 | 0.25 | 16IR14PT-M | | ● | 9.525 | 1.6 | 1.2 | 0.25 |
| 16 | (2.309) | 11 | R | 16ER11PT-B | ●* | | 9.525 | 1.5 | 1.1 | 0.28 | 16IR11PT-B | ●* | | 9.525 | 1.5 | 1.1 | 0.28 |
| 16 | (2.309) | 11 | R | 16ER11PT-M | | ● | 9.525 | 1.6 | 1.2 | 0.32 | 16IR11PT-M | | ● | 9.525 | 1.6 | 1.2 | 0.32 |

Note: ●* Please be aware of the different dimensions regarding "*t*" & "ℓ3".
Required to modify the position of the cutting edge.
Colored product needs to change the shim.

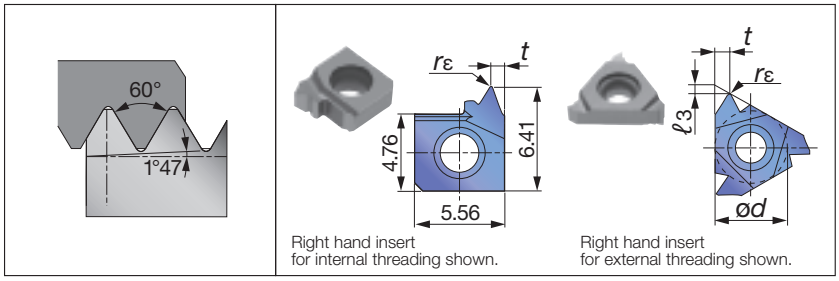
**Please check the items used and replace shims if necessary (see page B397).**




Inappropriate Examples

● : Line-up / Packing Quantity = 5 pcs.

# NPT




Right hand insert for internal threading shown.

Right hand insert for external threading shown.

## Applicable toolholders

| Insert size | External | Internal |
|---|---|---|
| 6 | | SNR/L000*K06SC...<br>SNR/L000*H06... |
| 16 | CER/L**16...<br>B-SER/L**16<br>B-CER/L**16<br>BC-SER/L**16 | TSNR/L**16<br>SNR/L**16...<br>TCNR/L**16...<br>CNR/L**16... |

## Full-profile insert

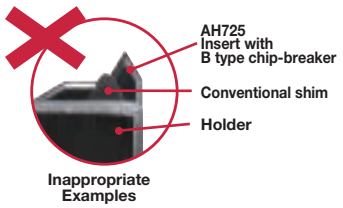
| Insert size | Pitch (Reference) | TPI | Hand of cut | External insert: Designation | Grade: Coating AH725 | Grade: Coating T313V | Grade: Un-coated TH10 | ød | t | ℓ3 | rε | Internal insert: Designation | Grade: Coating AH725 | Grade: Coating T313V | Grade: Un-coated TH10 | ød | t | ℓ3 | rε |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6 | (1.411) | 18 | R | | | | | | | | | 6IR18NPT | ● | | ● | - | 0.9 | - | 0.03 |
| 16 | (0.941) | 27 | R | 16ER27NPT | ● | | | 9.525 | 0.5 | 1.2 | 0.02 | 16IR27NPT | ● | | | 9.525 | 0.5 | 1.2 | 0.02 |
| 16 | (1.411) | 18 | R | 16ER18NPT | ● | ● | | 9.525 | 0.9 | 0.7 | 0.03 | 16IR18NPT | ● | | | 9.525 | 0.9 | 0.7 | 0.03 |
| 16 | (1.814) | 14 | R | 16ER14NPT | ● | | | 9.525 | 1.6 | 1.2 | 0.04 | 16IR14NPT | ● | | ● | 9.525 | 1.6 | 1.2 | 0.04 |
| 16 | (2.209) | 11.5 | R | 16ER115NPT | ● | | | 9.525 | 1.6 | 1.2 | 0.05 | 16IR115NPT | ● | | ● | 9.525 | 1.6 | 1.2 | 0.05 |
| 16 | (3.175) | 8 | R | 16ER8NPT | ● | | | 9.525 | 1.6 | 1.2 | 0.07 | 16IR8NPT | ● | | ● | 9.525 | 1.6 | 1.2 | 0.07 |

## Full-profile insert with chipbreaker

| Insert size | Pitch (Reference) | TPI | Hand of cut | External insert: Designation | Grade: Coating AH725 | Grade: Cermet NS9530 | ød | t | ℓ3 | rε | Internal insert: Designation | Grade: Coating AH725 | Grade: Cermet NS9530 | ød | t | ℓ3 | rε |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | (1.411) | 18 | R | 16ER18NPT-B | ●* | | 9.525 | 1 | 0.8 | 0.05 | | | | | | | |
| 16 | (1.411) | 18 | R | 16ER18NPT-M | | ● | 9.525 | 0.9 | 0.7 | 0.07 | 16IR18NPT-M | | ● | 9.525 | 0.9 | 0.7 | 0.07 |
| 16 | (1.814) | 14 | R | 16ER14NPT-B | ●* | | 9.525 | 1.2 | 0.9 | 0.05 | 16IR14NPT-B | ●* | | 9.525 | 1.2 | 0.9 | 0.05 |
| 16 | (1.814) | 14 | R | 16ER14NPT-M | | ● | 9.525 | 1.6 | 1.2 | 0.08 | 16IR14NPT-M | | ● | 9.525 | 1.6 | 1.2 | 0.08 |
| 16 | (2.209) | 11.5 | R | 16ER115NPT-B | ●* | | 9.525 | 1.5 | 1.1 | 0.09 | 16IR115NPT-B | ●* | | 9.525 | 1.5 | 1.1 | 0.09 |
| 16 | (2.209) | 11.5 | R | 16ER115NPT-M | | ● | 9.525 | 1.6 | 1.2 | 0.09 | 16IR115NPT-M | | ● | 9.525 | 1.6 | 1.2 | 0.09 |
| 16 | (3.175) | 8 | R | 16ER8NPT-B | ●* | | 9.525 | 1.8 | 1.3 | 0.12 | 16IR8NPT-B | ●* | | 9.525 | 1.8 | 1.3 | 0.12 |

Note: ●* Please be aware of the different dimensions regarding "*t*" & "ℓ3".
Required to modify the position of the cutting edge.
Colored product needs to change the shim.

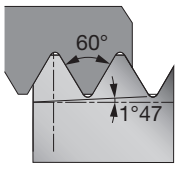
**Please check the items used and replace shims if necessary (see page B397).**

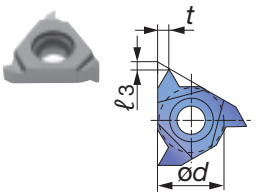



Inappropriate Examples

● : Line-up / Packing Quantity = 5 pcs.

# NPTF




Right hand insert
for external threading shown.

## Applicable toolholders

| Insert size | External | Internal |
|---|---|---|
| 16 | CER/L**16... | TSNR/L**16 |
| | B-SER/L**16 | SNR/L**16... |
| | B-CER/L**16 | TCNR/L**16... |
| | BC-SER/L**16 | CNR/L**16... |

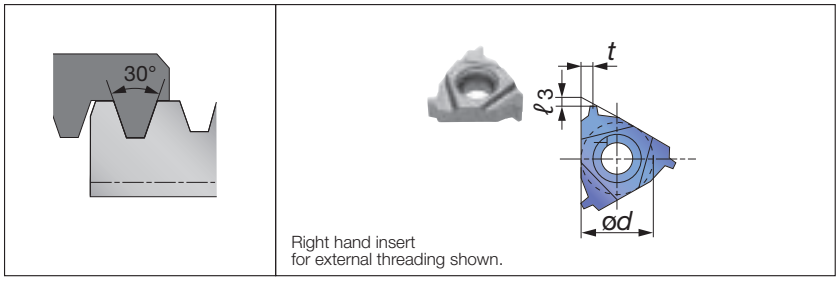


## Full-profile insert

| Insert size | Pitch (Reference) | TPI | Hand of cut | External insert | | | | | | Internal insert | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Designation | Grade / Coating / AH725 | ød | t | ℓ3 | rε | Designation | Grade / Coating / AH725 | ød | t | ℓ3 | rε |
| 16 | (0.941) | 27 | R | **16ER27NPTF** | ● | 9.525 | 0.5 | 1.2 | - | | | | | | |
| 16 | (1.411) | 18 | R | **16ER18NPTF** | ● | 9.525 | 0.9 | 0.7 | - | | | | | | |
| 16 | (1.814) | 14 | R | **16ER14NPTF** | ● | 9.525 | 1.6 | 1.2 | - | **16IR14NPTF** | ● | 9.525 | 1.6 | 1.2 | - |
| 16 | (2.209) | 11.5 | R | **16ER115NPTF** | ● | 9.525 | 1.6 | 1.2 | - | **16IR115NPTF** | ● | 9.525 | 1.6 | 1.2 | - |
| 16 | (3.175) | 8 | R | **16ER8NPTF** | ● | 9.525 | 1.6 | 1.2 | - | **16IR8NPTF** | ● | 9.525 | 1.6 | 1.2 | - |

● : Line-up / Packing Quantity = 5 pcs.

# 30° Trapezoidal (DIN103)




Right hand insert
for external threading shown.

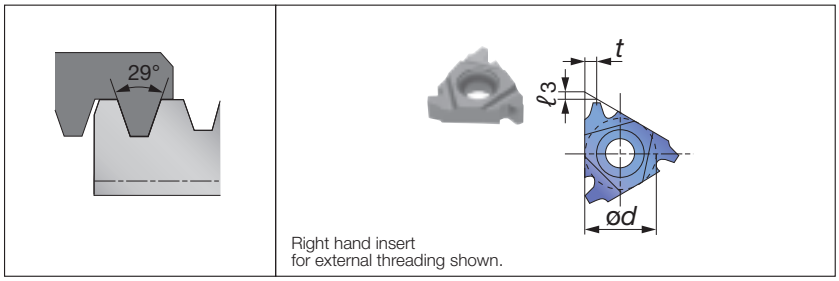
### Applicable toolholders

| Insert size | External | Internal |
|---|---|---|
| 16 | CER/L**16...<br>B-SER/L**16<br>B-CER/L**16<br>BC-SER/L**16 | TSNR/L**16<br>SNR/L**16...<br>TCNR/L**16...<br>CNR/L**16... |
| 22 | CER/L**22... | TSNR/L**22<br>SNR/L**22...<br>TCNR/L**22...<br>CNR/L**22... |
| 27 | CER/L**27... | |

### Special full-profile insert (see page B403)

| Insert size | Pitch | TPI | Hand of cut | External insert: Designation | Grade: Coating: AH725 | Grade: Coating: T313V | ød | t | ℓ3 | Internal insert: Designation | Grade: Coating: AH725 | Grade: Coating: T313V | ød | t | ℓ3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | 1.5 | | R | **16ER15TR** | ● | | 9.525 | 0.9 | 0.7 | **16IR15TR** | ● | | 9.525 | 0.9 | 0.7 |
| 16 | 2 | | R | **16ER20TR** | ● | ● | 9.525 | 1.6 | 1.3 | **16IR20TR** | ● | ● | 9.525 | 1.6 | 1.3 |
| 16 | 3 | | R | **16ER30TR** | ● | ● | 9.525 | 1.6 | 1.3 | **16IR30TR** | ● | ● | 9.525 | 1.6 | 1.3 |
| 22 | 4 | | R | **22ER40TR** | ● | ● | 12.7 | 2.5 | 2 | **22IR40TR** | ● | ● | 12.7 | 2.5 | 2 |
| 22 | 5 | | R | **22ER50TR** | ● | ● | 12.7 | 2.5 | 2 | **22IR50TR** | ● | ● | 12.7 | 2.5 | 2 |
| 27 | 6 | | R | **27ER60TR** | ● | ● | 15.875 | 3.2 | 2.5 | | | | | | |

# 29° Trapezoidal (ACME)




Right hand insert
for external threading shown.

### Applicable toolholders

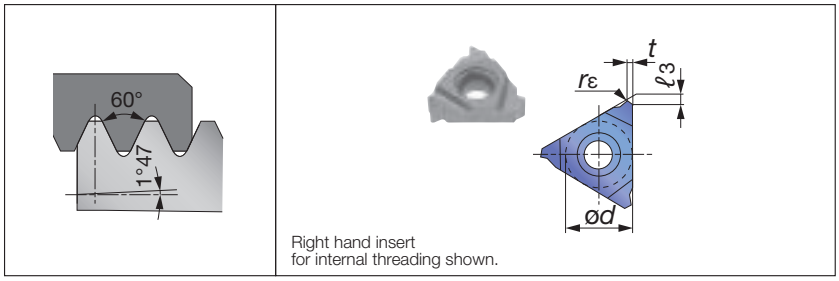
| Insert size | External | Internal |
|---|---|---|
| 16 | CER/L**16...<br>B-SER/L**16<br>B-CER/L**16<br>BC-SER/L**16 | TSNR/L**16<br>SNR/L**16...<br>TCNR/L**16...<br>CNR/L**16... |
| 22 | CER/L**22... | TSNR/L**22<br>SNR/L**22...<br>TCNR/L**22...<br>CNR/L**22... |

### Special full-profile insert (see page B403)

| Insert size | Pitch (Reference) | TPI | Hand of cut | External insert: Designation | Grade: Coating: AH725 | Grade: Coating: T313V | ød | t | ℓ3 | Internal insert: Designation | Grade: Coating: AH725 | Grade: Coating: T313V | ød | t | ℓ3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | (2.117) | 12 | R | **16ER12ACME** | ● | | 9.525 | 1.6 | 1.3 | **16IR12ACME** | ● | | 9.525 | 1.6 | 1.3 |
| 16 | (2.540) | 10 | R | **16ER10ACME** | ● | | 9.525 | 1.6 | 1.3 | **16IR10ACME** | ● | | 9.525 | 1.6 | 1.3 |
| 16 | (3.175) | 8 | R | **16ER8ACME** | ● | ● | 9.525 | 1.6 | 1.3 | **16IR8ACME** | ● | ● | 9.525 | 1.6 | 1.3 |
| 22 | (4.233) | 6 | R | **22ER6ACME** | ● | ● | 12.7 | 2.5 | 2 | **22IR6ACME** | ● | ● | 12.7 | 2.5 | 2 |
| 22 | (5.080) | 5 | R | **22ER5ACME** | ● | ● | 12.7 | 2.5 | 2 | **22IR5ACME** | ● | ● | 12.7 | 2.5 | 2 |

● : Line-up / Packing Quantity = 5 pcs.

# API Round



Right hand insert
for internal threading shown.

### Applicable toolholders

| Insert size | External | Internal |
|---|---|---|
| 16 | CER/L**16...<br>B-SER/L**16<br>B-CER/L**16<br>BC-SER/L**16 | TSNR/L**16<br>SNR/L**16...<br>TCNR/L**16...<br>CNR/L**16... |

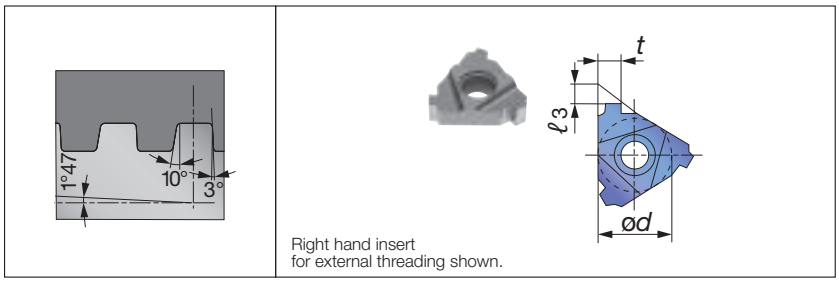
### Full-profile insert

| Insert size | Pitch (Reference) | TPI | Hand of cut | External insert: Designation | Grade: AH725 | Grade: T313V | ød | t | ℓ3 | rε | Internal insert: Designation | Grade: AH725 | Grade: T313V | ød | t | ℓ3 | rε |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | (2.54) | 10 | R | **16ER10RAPI** | ● | | 9.525 | 1.6 | 1.2 | 0.36 | **16IR10RAPI** | ● | ● | 9.525 | 1.6 | 1.2 | 0.36 |
| 16 | (3.175) | 8 | R | **16ER8RAPI** | ● | | 9.525 | 1.6 | 1.2 | 0.43 | **16IR8RAPI** | ● | ● | 9.525 | 1.6 | 1.2 | 0.43 |

### Full-profile insert with chipbreaker

| Insert size | Pitch (Reference) | Number of threads | Hand of cut | External insert: Designation | Grade: AH725 | ød | t | ℓ3 | rε | Internal insert: Designation | Grade: AH725 | ød | t | ℓ3 | rε |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | (2.54) | 10 | R | **16ER10RD-CB** | ● | 9.525 | 1.2 | 1.5 | 0.36 | **16IR10RD-CB** | ● | 9.525 | 1.2 | 1.5 | 0.36 |
| 16 | (3.175) | 8 | R | **16ER8RD-CB** | ● | 9.525 | 1.3 | 1.5 | 0.43 | **16IR8RD-CB** | ● | 9.525 | 1.3 | 1.5 | 0.43 |

# API Buttress



Right hand insert
for external threading shown.

### Applicable toolholders

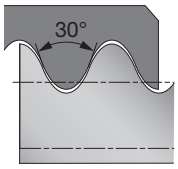
| Insert size | External | Internal |
|---|---|---|
| 22 | CER/L**22... | TSNR/L**22<br>SNR/L**22...<br>TCNR/L**22...<br>CNR/L**22... |

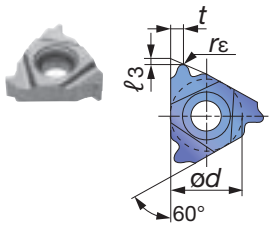
### Full-profile insert

| Insert size | Pitch (Reference) | TPI | Hand of cut | External insert: Designation | Grade: AH725 | ød | t | ℓ3 | Internal insert: Designation | Grade: AH725 | ød | t | ℓ3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 22 | (5.08) | 5 | R | **22ER5BAPI** | ● | 12.7 | 3.72 | 2.2 | **22IR5BAPI** | ● | 12.7 | 3.45 | 2.2 |

● : Line-up / Packing Quantity = 5 pcs.

# Round (DIN405)




Right hand insert
for external threading shown.

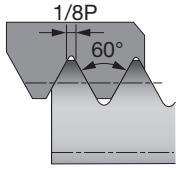
### Applicable toolholders

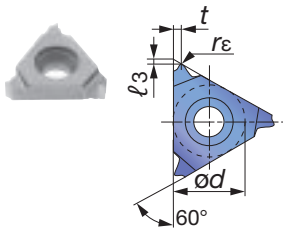
| Insert size | External | Internal |
|---|---|---|
| 16 | CER/L**16...<br>B-SER/L**16<br>B-CER/L**16<br>BC-SER/L**16 | TSNR/L**16<br>SNR/L**16...<br>TCNR/L**16...<br>CNR/L**16... |

### Full-profile insert with chipbreaker

| Insert size | Pitch (Reference) | TPI | Hand of cut | External insert | | | | | | Internal insert | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Designation | Grade / Coating / AH725 | ød | t | ℓ3 | rε | Designation | Grade / Coating / AH725 | ød | t | ℓ3 | rε |
| 16 | | 8 | R | **16ER8RD-B** | ● | 9.525 | 1.3 | 1.4 | - | | | | | | |
| 16 | | 6 | R | **16ER6RD-B** | ● | 9.525 | 1.7 | 1.5 | - | **16IR6RD-B** | ● | 9.525 | 1.5 | 1.4 | - |

# UNJ (Aerospace)




Right hand (R) shown.

### Applicable toolholders

| Insert size | External |
|---|---|
| 16 | CER/L**16...<br>B-SER/L**16<br>B-CER/L**16<br>BC-SER/L**16 |

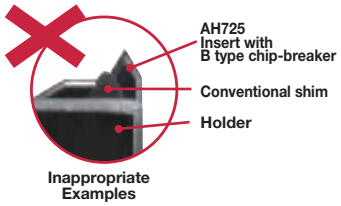
### Full-profile insert

| Insert size | Pitch (Reference) | TPI | Hand of cut | External insert | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Designation | Grade / Coating / AH725 | ød | t | ℓ3 | rε |
| 16 | | 32 | R | **16ER32UNJ** | ● | 9.525 | 0.5 | 1.2 | 0.13 |
| 16 | | 28 | R | **16ER28UNJ** | ● | 9.525 | 0.5 | 1.2 | 0.15 |
| 16 | | 24 | R | **16ER24UNJ** | ● | 9.525 | 0.9 | 0.7 | 0.18 |
| 16 | | 20 | R | **16ER20UNJ** | ● | 9.525 | 0.9 | 0.7 | 0.21 |
| 16 | | 18 | R | **16ER18UNJ** | ● | 9.525 | 0.9 | 0.7 | 0.24 |
| 16 | | 16 | R | **16ER16UNJ** | ● | 9.525 | 0.9 | 0.7 | 0.26 |
| 16 | | 14 | R | **16ER14UNJ** | ● | 9.525 | 1.6 | 1.2 | 0.3 |
| 16 | | 12 | R | **16ER12UNJ** | ● | 9.525 | 1.6 | 1.2 | 0.35 |
| 16 | | 10 | R | **16ER10UNJ** | ● | 9.525 | 1.6 | 1.2 | 0.42 |
| 16 | | 8 | R | **16ER8UNJ** | ● | 9.525 | 1.6 | 1.2 | 0.53 |

● : Line-up / Packing Quantity = 5 pcs.

## IMPORTANT NOTICE - Replacement of shim sheet

**Please check the items used and replace shims if necessary (see the following list).**






### List of interchangeable Shims (Size 16 · Insert).

| Holder type | Lead Angle | External designation | | Internal designation | |
|---|---|---|---|---|---|
| | | ① Conventional | ❶ Standard (New) | ② Conventional | ❷ Standard (New) |
| Dual clamping methods of screw-on and clamp-on | 4° | GXE16-4DT | AE16-4DT | GXN16-4DT | AN16-4DT |
| | 3° | GXE16-3DT | AE16-3DT | GXN16-3DT | AN16-3DT |
| | 2° | GXE16-2DT | AE16-2DT | GXN16-2DT | AN16-2DT |
| | 1° (Standard) | GX16-1DT | A16-1DT | GX16-1DT | A16-1DT |
| | 0° | GXE16-0DT | AE16-0DT | GXN16-0DT | AN16-0DT |
| | -1° | GXE16-99DT | AE16-99DT | GXN16-99DT | AN16-99DT |
| | -2° | GXE16-98DT | AE16-98DT | GXN16-98DT | AN16-98DT |
| Clamp-on | 4° | GXE16-4 | AE16-4 | GXN16-4 | AN16-4 |
| | 3° | GXE16-3 | AE16-3 | GXN16-3 | AN16-3 |
| | 2° | GXE16-2 | AE16-2 | GXN16-2 | AN16-2 |
| | 1° (Standard) | GXE16-1 | A16-1 | GXN16-1 | A16-1 |
| | 0° | GXE16-0 | AE16-0 | GXN16-0 | AN16-0 |
| | -1° | GXE16-99 | AE16-99 | GXN16-99 | AN16-99 |
| | -2° | GXE16-98 | AE16-98 | GXN16-98 | AN16-98 |

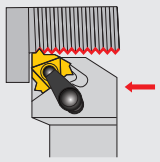
### Target items for the replacement of shims (Size 16 · Insert).

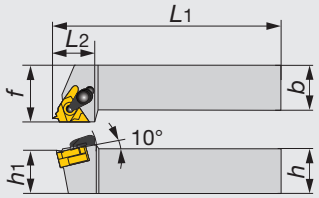
| Thread type | External | | | Internal | | |
|---|---|---|---|---|---|---|
| | Designation | Grade | Replacement | Designation | Grade | Replacement |
| ISO | | | ① Conventional ↓ ❶ Standard (New) | 16IR15ISO-B | AH725 | ② Conventional ↓ ❷ Standard (New) |
| | | | | 16IR175ISO-B | AH725 | |
| | | | | 16IR20ISO-B | AH725 | |
| 55° | 16ERAG55-B | AH725 | | 16IRAG55-B | AH725 | |
| | | | | 16IRG55-B | AH725 | |
| 60° | 16ERA60-B | AH725 | | 16IRAG60-B | AH725 | |
| | | | | 16IRA60-B | AH725 | |
| | | | | 16IRG60-B | AH725 | |
| UN | | | | 16IR18UN-B | AH725 | |
| | | | | 16IR16UN-B | AH725 | |
| | | | | 16IR14UN-B | AH725 | |
| W | | | | 16IR16W-B | AH725 | |
| | | | | 16IR14W-B | AH725 | |
| PT | | | | 16IR14PT-B | AH725 | |
| NPT | 16ER8NPT-B | AH725 | | 16IR14NPT-B | AH725 | |
| | | | | 16IR115NPT-B | AH725 | |

# TUNGTHREAD

## CER/L

External threading toolholders, Altanative clamping of screw-on or clamp-on (DT type only)






Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | Insert |
|---|---|---|---|---|---|---|---|
| CER/L1212H16DT | 12 | 12 | 100 | 24 | 12 | 16 | 16ER/L... |
| CER/L1616H16DT | 16 | 16 | 100 | 24 | 16 | 20 | 16ER/L... |
| CER/L2020K16DT | 20 | 20 | 125 | 24 | 20 | 25 | 16ER/L... |
| CER/L2525M16DT | 25 | 25 | 150 | 28 | 25 | 32 | 16ER/L... |
| CER/L2525M22DT | 25 | 25 | 150 | 31.3 | 25 | 32 | 22ER/L... |
| CER3232P16T | 32 | 32 | 170 | 32 | 32 | 40 | 16ER... |
| CER3232P22T | 32 | 32 | 170 | 32 | 32 | 40 | 22ER... |
| CER2525M27T | 25 | 25 | 150 | 34 | 25 | 32 | 27ER... |
| CER3232P27T | 32 | 32 | 170 | 34 | 32 | 40 | 27ER... |

Note: A clamp set for CER/L type consists of a clamp and a clamping screw. A shim set for CER/L type consists of a shim and a shim screw. Standard shims for CER/L type can be used for both left hand and right hand toolholders. Use either of the sides depending on the hand.

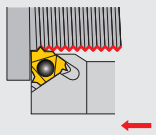
### SPARE PARTS

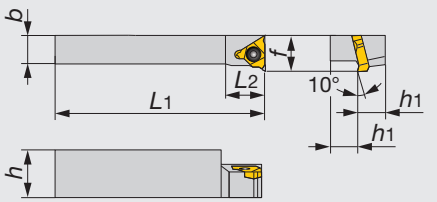
| Designation | Clamp set | Clamping screw | Screw | Shim | Shim set | Wrench | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|---|---|
| CER/L**16DT | CSP16 | CSTB-3.5ST | DTS5-3.5 | A16-1DT | - | P-3.5 | T-15F | - |
| CER/L2525M22DT | CSP22 | CSTB-4ST | DTS6-4 | GX22-1DT | - | P-4 | T-15F | T-20F |
| CER3232P16T | CSP16 | - | - | - | A16-1 | - | T-15F | - |
| CER3232P22T | CSP22 | - | - | - | NXE22-1 | - | T-20F | - |
| CER**27T | CSP27 | - | - | - | NXE27-1 | P-4 | - | - |

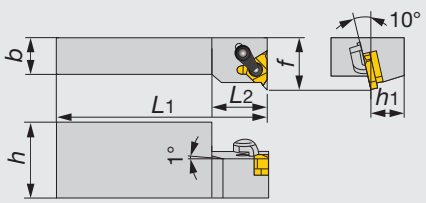
# TUNGTHREAD

## B-S/CER/L

External threading toolholders for small lathe






Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | Insert |
|---|---|---|---|---|---|---|---|
| B-SER10H16 | 20 | 10 | 100 | 15 | 10 | 16 | 16ER... |
| B-SER12K16 | 24 | 12 | 125 | 18 | 12 | 18 | 16ER... |
| B-CER/L16M16 | 32 | 16 | 150 | 24 | 16 | 22 | 16ER/L... |

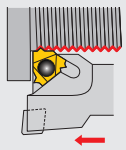
### SPARE PARTS

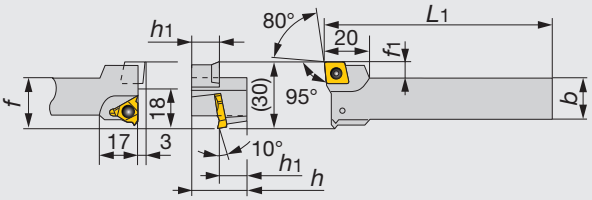
| Designation | Clamp set | Shim set | Clamping screw | Wrench |
|---|---|---|---|---|
| B-SER**16 | - | - | CSTB-3.5 | T-15F |
| B-CER/L16M16 | CSP16 | A16-1 | - | T-15F |

CER/L, B-S/CER/L: Inserts → **B384 -**, Standard cutting conditions → **B382**

# TUNGTHREAD
## BC-SER/L

Multi functional external threading toolholders for small lathe






Right hand (R) shown.

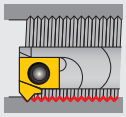
| Designation | h | b | L1 | h1 | f | f1 | Insert |
|---|---|---|---|---|---|---|---|
| BC-SER12K16 | 24 | 16 | 125 | 12 | 23 | 7 | 16ER..., CC*T09T3... |

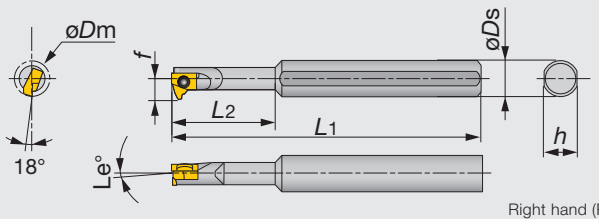
**SPARE PARTS**

| Designation | Clamping screw | Wrench |
|---|---|---|
| BC-SER12K16 | CSTB-3.5 | T-15F |

# TUNGTHREAD
## SNR/L-2/3

Small bars for internal threading, Screw-on clamp






Right hand (R) ,carbide shank type shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | Le° | Insert |
|---|---|---|---|---|---|---|---|---|---|
| SNR0006H06-2 | STEEL | 8 | 8 | 4.7 | 100 | 18 | 7 | 2 | 6IR... |
| SNR0006H06-3 | STEEL | 8 | 8 | 4.7 | 100 | 18 | 7 | 3 | 6IR... |
| SNR0008H06-2 | STEEL | 10 | 8 | 5.7 | 100 | - | 7 | 2 | 6IR... |
| SNR0008H06-3 | STEEL | 10 | 8 | 5.7 | 100 | - | 7 | 3 | 6IR... |
| SNR0006K06SC-2 | CARBIDE | 8 | 8 | 4.7 | 125 | 30 | 7 | 2 | 6IR... |
| SNR0006K06SC-3 | CARBIDE | 8 | 8 | 4.7 | 125 | 30 | 7 | 3 | 6IR... |
| SNR0008K06SC-2 | CARBIDE | 10 | 8 | 5.7 | 125 | - | 7 | 2 | 6IR... |
| SNR0008K06SC-3 | CARBIDE | 10 | 8 | 5.7 | 125 | - | 7 | 3 | 6IR... |

Note: When using the right hand insert (6IR** type), is used for the right hand toolholders (SNR** type).

**SPARE PARTS**

| Designation | Clamping screw | Wrench |
|---|---|---|
| SNR0006H06... | CSTB-2L040 | T-6F |
| SNR0008H06... | CSTB-2L | T-6F |
| SNR0006K06SC... | CSTB-2L040 | T-6F |
| SNR0008K06SC... | CSTB-2L | T-6F |

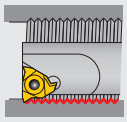
BC-SER/L: Inserts → **B104 -** (CC*T09T3...)**, B384 -** (16ER...),
Standard cutting conditions → **B382**

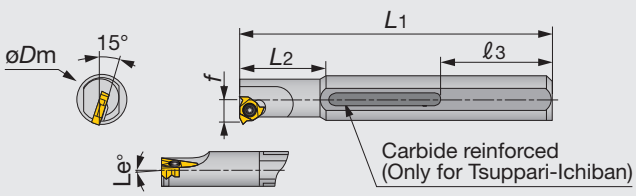
SNR/L-2/3: Inserts → **B384 -**, Standard cutting conditions → **B382**

# SNR/L

## Internal threading bars, Screw-on clamp








Right hand (R),
Tsuppari-Ichiban shank type shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | ℓ3 | h | b | Le° | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TSNR0016Q16 | TSUPPARI | 19 | 16 | 10.6 | 180 | 40 | 59 | 15 | - | 1 | 16IR... |
| TSNR0020R22 | TSUPPARI | 24 | 20 | 13.9 | 200 | 50 | 49 | 18 | - | 1 | 22IR... |
| SNR/L0010K11 | STEEL | 12 | 16 | 6.6 | 125 | 25 | - | 15 | 15.5 | 1 | 11IR/L... |
| SNR0010K11-2 | STEEL | 12 | 16 | 6.6 | 125 | 25 | - | 15 | 15.5 | 2 | 11IR... |
| SNR0010K11-3 | STEEL | 12 | 16 | 6.6 | 125 | 25 | - | 15 | 15.5 | 3 | 11IR... |
| SNR/L0013L11 | STEEL | 15 | 16 | 8.2 | 140 | 32.5 | - | 15 | 15.5 | 1 | 11IR/L... |
| SNR0013L11-2 | STEEL | 15 | 16 | 8.2 | 140 | 32.5 | - | 15 | 15.5 | 2 | 11IR... |
| SNR0013L11-3 | STEEL | 15 | 16 | 8.2 | 140 | 32.5 | - | 15 | 15.5 | 3 | 11IR... |
| SNR/L0016M16 | STEEL | 19 | 16 | 10.6 | 150 | 40 | - | 15 | 15.5 | 1 | 16IR/L... |
| SNR0016M16-2 | STEEL | 19 | 16 | 10.6 | 150 | 40 | - | 15 | 15.5 | 2 | 16IR... |
| SNR0016M16-3 | STEEL | 19 | 16 | 10.6 | 150 | 40 | - | 15 | 15.5 | 3 | 16IR... |
| SNR/L0020Q22 | STEEL | 24 | 20 | 13.9 | 180 | 50 | - | 18 | 19 | 1 | 22IR/L... |
| SNR0020Q22-2 | STEEL | 24 | 20 | 13.9 | 180 | 50 | - | 18 | 19 | 2 | 22IR... |
| SNR0020Q22-3 | STEEL | 24 | 20 | 13.9 | 180 | 50 | - | 18 | 19 | 3 | 22IR... |
| SNR0010M11SC | CARBIDE | 13 | 10 | 7.4 | 150 | 24 | - | 9 | - | 1 | 11IR... |
| SNR0010M11SC-2 | CARBIDE | 13 | 10 | 7.4 | 150 | 24 | - | 9 | - | 2 | 11IR... |
| SNR0010M11SC-3 | CARBIDE | 13 | 10 | 7.4 | 150 | 24 | - | 9 | - | 3 | 11IR... |
| SNR0012P11SC | CARBIDE | 15 | 12 | 8.5 | 170 | 28 | - | 11 | - | 1 | 11IR... |
| SNR0012P11SC-2 | CARBIDE | 15 | 12 | 8.5 | 170 | 28 | - | 11 | - | 2 | 11IR... |
| SNR0012P11SC-3 | CARBIDE | 15 | 12 | 8.5 | 170 | 28 | - | 11 | - | 3 | 11IR... |
| SNR/L0016R16SC | CARBIDE | 20 | 16 | 11.9 | 200 | 35 | - | 15 | - | 1 | 16IR/L... |
| SNR0016R16SC-2 | CARBIDE | 20 | 16 | 11.9 | 200 | 35 | - | 15 | - | 2 | 16IR... |

Note: When using a right or left hand insert, the right hand insert (**IR...type) is used for the right hand toolholders (SNR...type) and left hand insert (**IL...type) is used for the left hand toolholders (SNL...type).

### SPARE PARTS

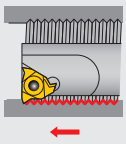


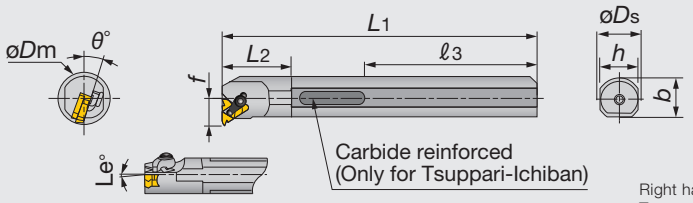

| Designation | Clamping screw | Wrench |
|---|---|---|
| TSNR0016Q16 | CSTB-3.5 | T-15F |
| TSNR0020R22 | CSTB-4 | T-15F |
| SNR/L00**11... | CSTB-2.5 | T-8F |
| SNR/L0016M16... | CSTB-3.5 | T-15F |
| SNR/L0020Q22... | CSTB-4 | T-15F |
| SNR00**11SC... | CSTB-2.5 | T-8F |
| SNR/L0016R16SC... | CSTB-3.5 | T-15F |

SNR/L: Inserts → **B384 -**, Standard cutting conditions → **B382**

# CNR/L

## Internal threading bars, Alternative clamping of screw-on or clamp-on(DT type only)






Right hand (R),
Tsuppari-Ichiban shank type shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | ℓ3 | h | b | θ° | Le° | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TCNR0020R16DT | TSUPPARI | 24 | 20 | 14 | 200 | 30 | 49 | 18 | - | 15 | 1 | 16IR... |
| TCNR0025S16DT | TSUPPARI | 29 | 25 | 16.5 | 250 | 38 | 64 | 23 | - | 15 | 1 | 16IR... |
| TCNR0025S22DT | TSUPPARI | 30 | 25 | 18.2 | 250 | 38 | 64 | 23 | - | 15 | 1 | 22IR... |
| CNR/L0020P16 | STEEL | 24 | 20 | 14 | 170 | 30 | - | 18 | 19 | 15 | 1 | 16IR/L... |
| CNR/L0025R16 | STEEL | 29 | 25 | 16.5 | 200 | 38 | - | 23 | 24 | 15 | 1 | 16IR/L... |
| CNR/L0032S16 | STEEL | 37 | 32 | 20.1 | 250 | 48 | - | 30 | 31 | 15 | 1 | 16IR/L... |
| CNR/L0025R22 | STEEL | 30 | 25 | 18.2 | 200 | 38 | - | 23 | 24 | 15 | 1 | 22IR/L... |
| CNR/L0032S22 | STEEL | 38 | 32 | 21.9 | 250 | 48 | - | 30 | 31 | 15 | 1 | 22IR/L... |
| CNR0040T27 | STEEL | 46 | 40 | 26.9 | 300 | 60 | - | 37 | 38.5 | 10 | 1 | 27IR... |

Note: A clamp set for CNR/L type toolholders consists of a clamp and a clamping screw. A shim set for CNR/L type toolholders consists of a shim and a shim fixing screw. Standard shims for CNR/L type toolholders are commonly used for right and left hand toolholders. The right hand insert (IR) is used for the right hand toolholder (CNR...) and left hand insert (IL) is used for left hand toolholder (CNL...).

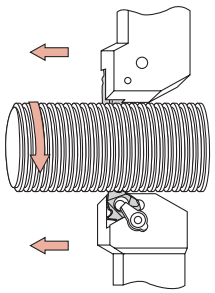
### SPARE PARTS

| Designation | Clamp set | Clamping screw | Screw | Shim | Shim set R | Shim set L | Wrench | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|---|---|---|
| TCNR002**16DT | CSP16 | CSTB-3.5ST | DTS5-3.5 | A16-1DT | - | - | P-3.5 | T-15F | - |
| TCNR0025S22DT | CSP22 | CSTB-4ST | DTS6-4 | GX22-1DT | - | - | P-4 | T-15F | T-20F |
| CNR/L**16 | CSP16 | - | - | - | A16-1 | A16-1 | - | T-15F | - |
| CNR/L**22 | CSP22 | - | - | - | NXN22-1 | NXE22-1 | - | T-20F | - |
| CNR0040T27 | CSP27 | - | - | - | NXN27-1 | NXE27-1 | P-4 | - | - |

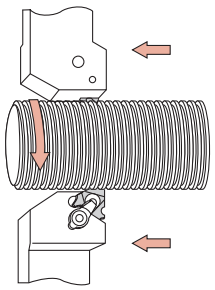
CNR/L: Inserts → **B384 -**, Standard cutting conditions → **B382**

## External threading

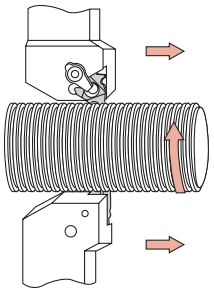
### Right hand thread



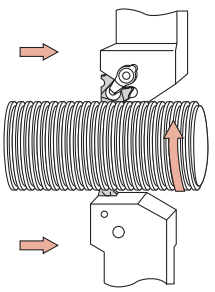
| Work rotation | Regular |
|---|---|
| Feed direction | Push |
| Hand of toolholder | Right |
| Hand of insert | Right |
| Standard shim | ① |



| Work rotation | Regular |
|---|---|
| Feed direction | Pull |
| Hand of toolholder | Left |
| Hand of insert | Left |
| Standard shim | ④ |

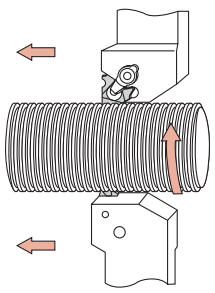


| Work rotation | Reverse |
|---|---|
| Feed direction | Push |
| Hand of toolholder | Right |
| Hand of insert | Right |
| Standard shim | ① |

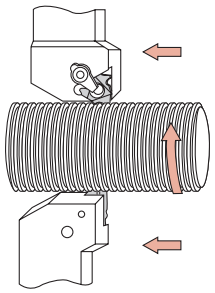


| Work rotation | Reverse |
|---|---|
| Feed direction | Pull |
| Hand of toolholder | Left |
| Hand of insert | Left |
| Standard shim | ④ |

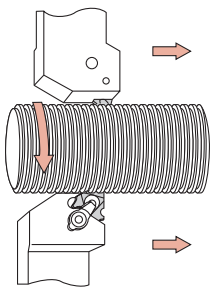
### Left hand thread



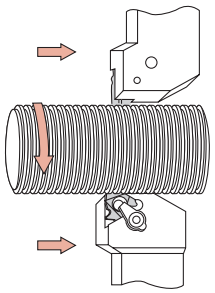
| Work rotation | Reverse |
|---|---|
| Feed direction | Push |
| Hand of toolholder | Left |
| Hand of insert | Left |
| Standard shim | ② |



| Work rotation | Reverse |
|---|---|
| Feed direction | Pull |
| Hand of toolholder | Right |
| Hand of insert | Right |
| Standard shim | ③ |



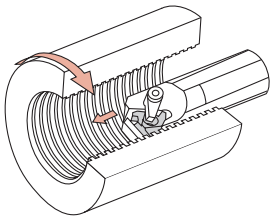
| Work rotation | Regular |
|---|---|
| Feed direction | Push |
| Hand of toolholder | Left |
| Hand of insert | Left |
| Standard shim | ② |



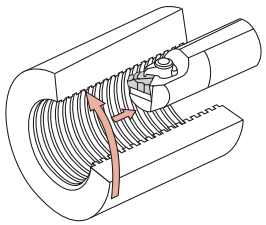
| Work rotation | Regular |
|---|---|
| Feed direction | Pull |
| Hand of toolholder | Right |
| Hand of insert | Right |
| Standard shim | ③ |

## Internal threading

### Right hand thread

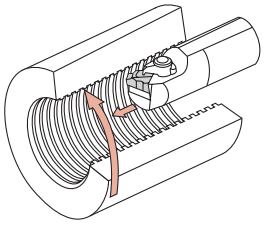


| Work rotation | Regular |
|---|---|
| Feed direction | Push |
| Hand of toolholder | Right |
| Hand of insert | Right |
| Standard shim | ② |

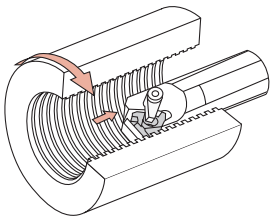


| Work rotation | Reverse |
|---|---|
| Feed direction | Pull |
| Hand of toolholder | Left |
| Hand of insert | Left |
| Standard shim | ③ |

### Left hand thread



| Work rotation | Reverse |
|---|---|
| Feed direction | Push |
| Hand of toolholder | Left |
| Hand of insert | Left |
| Standard shim | ① |



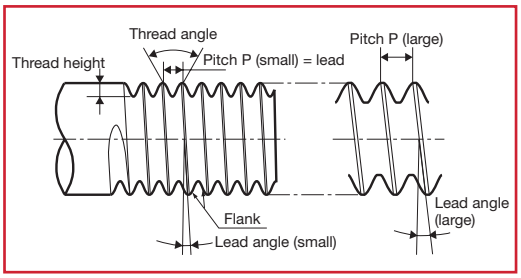
| Work rotation | Regular |
|---|---|
| Feed direction | Pull |
| Hand of toolholder | Right |
| Hand of insert | Right |
| Standard shim | ④ |

## Standard shim

| No. | New | No. | New |
|---|---|---|---|
| ① | A16-1DT | ② | A16-1DT |
| | A16-1 | | A16-1 |
| | GX22-1DT | | GX22-1DT |
| | NXE22-1 | | NXN22-1 |
| | NXE27-1 | | NXN27-1 |
| ③ | AE16-99DT | ④ | AN16-99DT |
| | AE16-99 | | AN16-99 |
| | GXE22-99DT | | GXN22-99DT |
| | NXE22-99 | | NXN22-99 |
| | NXE27-99 | | NXN27-99 |

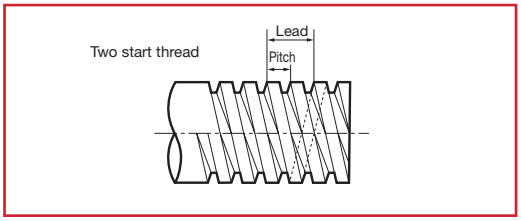
## Relationship between lead, lead angle and pitch

1. Lead is the axial distance a screw advances in one rotation. In single start screw, the lead is equal to the pitch.
2. The inclination angle of a threaded groove is called lead angle. In screws of the same diameter, the lead angle increases as the pitch increases.
3. The side face of a completed thread groove is called flank. The distance between the crest and the root is called thread height.




## Single and multi start thread

1. The single start thread has a single groove. Two start thread or three start thread has two grooves or three grooves respectively.
2. The pitch of multi start thread is the distance of adjoining groove.
3. When viewing the section of the multi start thread, the pitch is same as that of the single start thread. The lead of the two or three start thread is twice or three times the pitch. The multi start thread is mainly used for trapezoidal threads.




## Tolerance class of threads

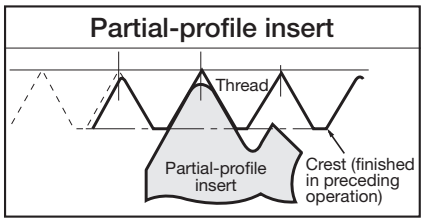
Tolerance classes of screw threads are expressed as follows:
Metric coarse external thread: 6h, 6g Metric coarse internal thread: 5H, 6H
These classes are ranked with tolerances of thread diameter, pitch, thread angle, etc. For fastening applications, 6H- and 6g-class (former JIS second class) threads, manufactured by cutting or rolling, are generally used. 5H- and 4h-class threads (former JIS first class) are generally finished by grinding.
For example, M8-6g means metric coarse external thread of 6g tolerance class.

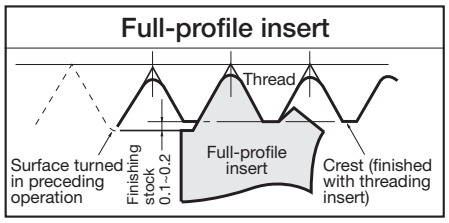
# TAC threading insert

## Difference between full-profile and partial-profile insert

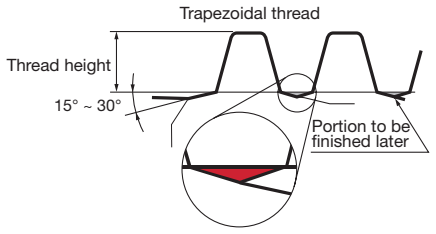
### Full-profile insert

In the full-profile insert, the major diameter of the thread is finished by the profiled finishing edge as shown in Figure below. Therefore, about 0.1 mm of finishing stock must be left on the outer surface of the workpiece before threading. In trapezoidal threads, since slants of 15° to 30° are left on the crest of the thread as shown in Figure below, these portions must be finished by another tool later.
Full-profile insert could produce no burr and good thread by the profiled finishing edge.




### When machining trapezoidal threads:




### Partial-profile insert

Partial-profile inserts can not be used for finishing of the crest, but can be applied to a wide range of pitches.

For example

| Designation | Pitch (mm) | TPI | Insert radius $r_\varepsilon$ (mm) |
|---|---|---|---|
| 16ERA60 | 0.5 ~ 1.5 | 48 ~ 16 | 0.06 |
| 16ERG60 | 1.75 ~ 3 | 14 ~ 8 | 0.22 |

Corner radii of inserts are fitted to the thread of the smallest pitch.

## Difference between external and internal use inserts

In full-profile inserts for metric and unified threads, the corner radius and thread height differ from those for the external and internal use insert respectively. Therefore, the right hand insert for external use and the left hand insert for internal use are not the same tool.
Since the rake angles of toolholders are -10° for external toolholders and -15° for internal toolholders, the external / internal toolholders can not be used for machining internal / external thread.
In Whitworth thread, though the external thread and internal thread have the same thread form, the external and internal toolholders are incompatible because of the different rake angle.

**For example**

| Designation | Applicable inserts | Insert radius $r_\varepsilon$ (mm) | Thread hight h (mm) | Rake angle of holders |
|---|---|---|---|---|
| 16ER20ISO | External | 0.25 | 1.52 | -10° |
| 16IL20ISO | Internal | 0.14 | 1.3 | -15° |

# Compensation for the lead angle and tool relief angle

When the pitch is large or the screw diameter is small, the lead angle becomes large and the effective relief angle on the advance flank side $\beta_2$ becomes small. In particular, this will cause shorter life of the insert in the case of trapezoidal screw with small flank angle. It is ideal without any interference for the thread cutting insert to have an equal relief angle on both right and left. Replace the shim so that the rake face of insert faces the thread groove direction (that is, $\beta = \beta_3$).

## Calculating the lead angle

The lead angle is calculated as follows:

$$\beta = \tan^{-1}(\ell / \pi d) = \tan^{-1}(nP/\pi d)$$

$\beta$ : Lead angle
$\ell$ : Lead
$n$ : No. of threads
$P$ : Pitch
$d$ : Pitch diameter

## Calculating the relief angle

The relief angle $\beta_1$ is calculated as follows:

$$\beta_1 = \tan^{-1}(\tan\theta \cdot \tan\alpha)$$

The $\alpha$ of a standard toolholder is 10° for external threading and 15° for internal threading.

| Included angle $2\theta$ | $\theta$ | $\beta_1$ | |
|---|---|---|---|
| | | External threading tool | Internal threading tool |
| 60° | 30° | 5.8° | 8.8° |
| 55° | 27.5° | 5.2° | 7.9° |
| 30° | 15° | 2.7° | 4.1° |
| 29° | 14.5° | 2.6° | 4° |

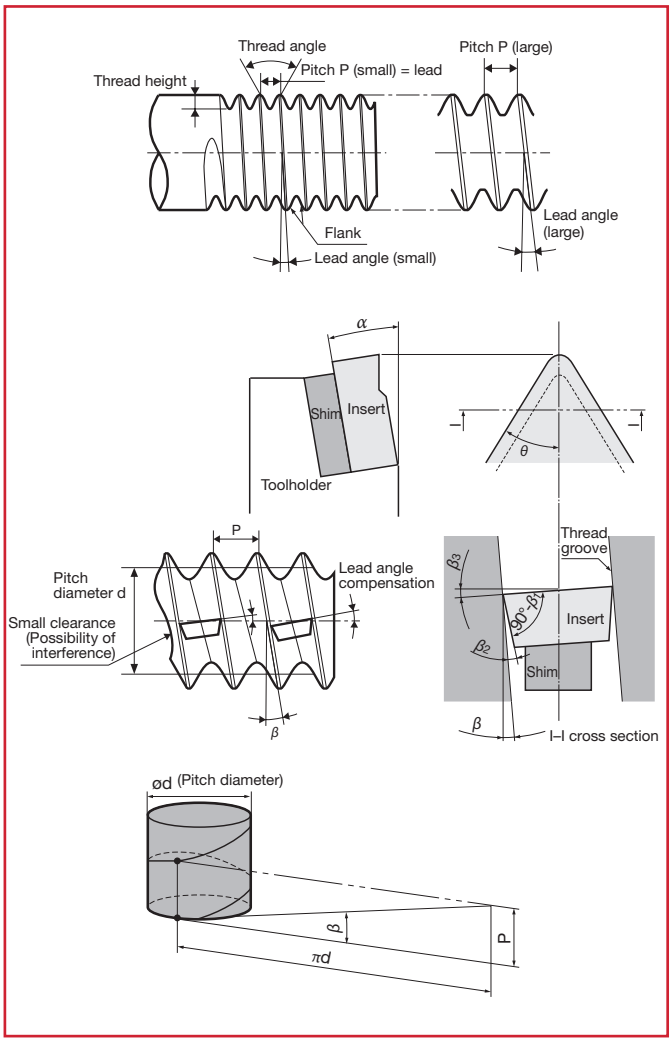
Accordingly, the effective relief angle is calculated as follows:

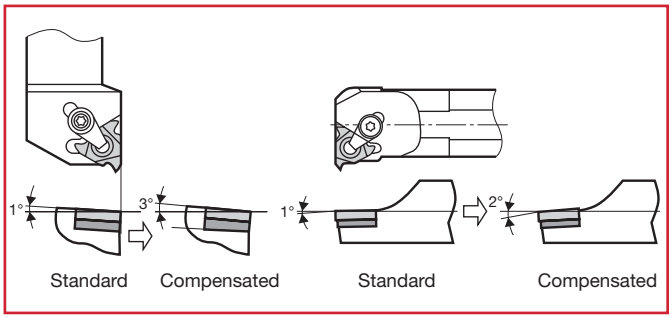
$$\beta_2 = \beta_1 + \beta_3 - \beta$$

$\beta$ : Lead angle
$\beta_2$ : Effective relief angle
$\beta_3$ : Lead angle compensation value

In other words, $\beta_1 = \beta_2$ when the thread lead angle is equal to the compensation value. Namely, the relief angle of the tool itself is equal to the effective relief angle. If the wrong compensation value is used, $\beta_1 > \beta_2$. The effective relief angle becomes smaller and cause the interference between the frank side of insert and the thread groove. Therefore, carry out com-pensation of the lead angle so that the following range is obtained:

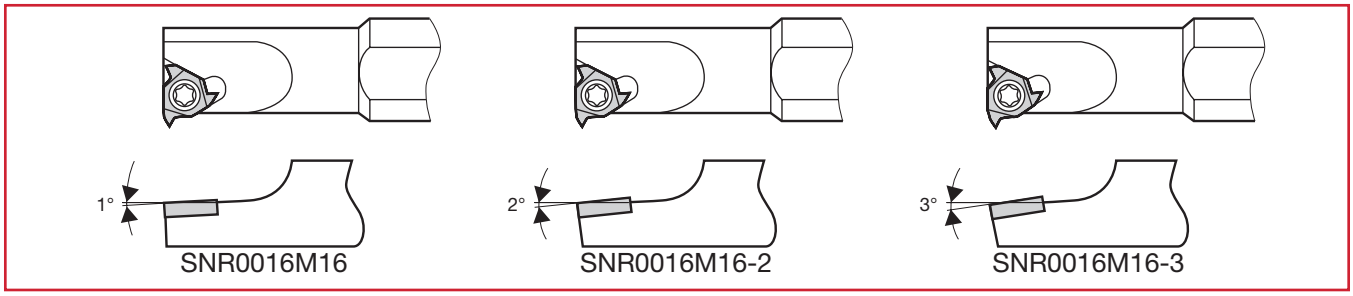
**±1° when the thread angle is 60° and 55°**
**±30′ when the thread angle is 30° and 29°**




## Compensation of lead angle for shim less internal toolholders

When using internal threading toolholders without shim, the above-mentioned method can not be applied for lead angle compensation. Therefore, special toolholders for large lead angles are available as shown below. The final figure of the designation (-2 or -3) indicates 2° or 3° lead angle to be used respectively. The toolholders without these figures are for 1° lead angle.



## Type of shim and the compensation value of lead angle

The designation of the shim and compensated lead angles are shown in the table.

| Compensated lead angles | -2° | -1° | 0° | 1° | 2° | 3° | 4° |
|---|---|---|---|---|---|---|---|
| Shim | □□□-98 | □□□-99 | □□□-0 | □□□-1 | □□□-2 | □□□-3 | □□□-4 |

Note: The last numeral of the shim designation is the compensated lead angle.

## ■ Toolholders and applicable shims

### Screw-on / clamp-on dual toolholders

| Toolholder designation | Shim | |
|---|---|---|
| | R | L |
| CER/L□□□□□16DT | AE16-□DT | AN16-□DT |
| CER/L□□□□□22DT | GXE22-□DT | GXN22-□DT |
| TCNR/L□□□□□16DT | AN16-□DT | AE16-□DT |
| TCNR/L□□□□□22DT | GXN22-□DT | GXE22-□DT |

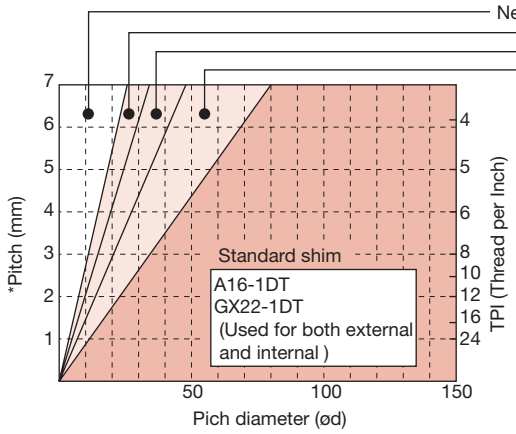
Note: Standard shim is AE16-1DT or GX22-1DT. Other types are optional.

### Clamp-on type toolholders

| Toolholder designation | Shim | |
|---|---|---|
| | R | L |
| CER/L□□□□□16-T | AE16-□ | AN16-□ |
| CER/L□□□□□22-T | NXE22-□ | NXN22-□ |
| CER/L□□□□□27-T | NXE27-□ | NXN27-□ |
| CNR/L□□□□□16 | AN16-□ | AE16-□ |
| CNR/L□□□□□22 | NXN22-□ | NXE22-□ |
| CNR/L□□□□□27 | NXN27-□ | NXE27-□ |
| B-CER/L□□□16 | AE16-□ | AN16-□ |

Note: Standard shim is □□□□□-1. Other types are optional.

## Shim selection guide for screw-on / clamp-on dual ST-type tools

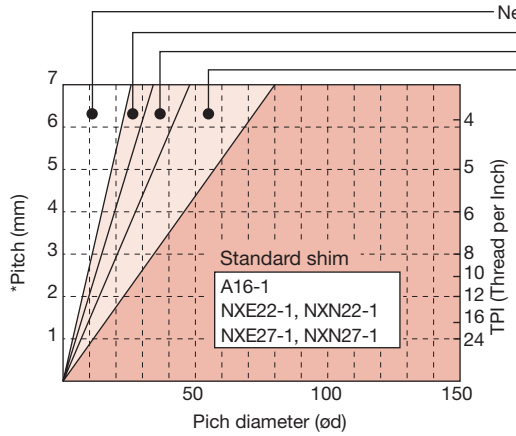



* For the multi start thread lead(multiplied by the pitch and No. of threads)

● List of exchangeable shims

| | Designation | D30 | Designation | D30 | Designation | D30 | Designation | D30 |
|---|---|---|---|---|---|---|---|---|
| β3 = 4° | AE16-4DT | ● | AN16-4DT | ● | GXE22-4DT | ● | GXN22-4DT | ● |
| β3 = 3° | AE16-3DT | ● | AN16-3DT | ● | GXE22-3DT | ● | GXN22-3DT | ● |
| β3 = 2° | AE16-2DT | ● | AN16-2DT | ● | GXE22-2DT | ● | GXN22-2DT | ● |
| β3 = 1° Standard shim | A16-1DT | ● | A16-1DT | ● | GX22-1DT | ● | GX22-1DT | ● |
| β3 = 0° | AE16-0DT | ● | AN16-0DT | ● | GXE22-0DT | ● | GXN22-0DT | ● |
| β3 = -1° | AE16-99DT | ● | AN16-99DT | ● | GXE22-99DT | ● | GXN22-99DT | ● |
| β3 = -2° | AE16-98DT | ● | AN16-98DT | ● | GXE22-98DT | ● | GXN22-98DT | ● |
| Applicable toolholders | CER--16DT TCNL--16DT | | CEL--16DT TCNR--16DT | | CER--22DT TCNL--22DT | | CEL--22DT TCNR--22DT | |

## Shim selection guide for clamp-on type ST-tools




* For the multi start thread lead(multiplied by the pitch and No. of threads)

● List of exchangeable shims

| | Designation | D30 | Designation | D30 | Designation | D30 | Designation | D30 | Designation | D30 | Designation | D30 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| β3 = 4° | AE16-4 | ● | AN16-4 | ● | NXE22-4 | ● | NXN22-4 | ● | NXE27-4 | | NXN27-4 | |
| β3 = 3° | AE16-3 | ● | AN16-3 | ● | NXE22-3 | ● | NXN22-3 | ● | NXE27-3 | | NXN27-3 | |
| β3 = 2° | AE16-2 | ● | AN16-2 | ● | NXE22-2 | ● | NXN22-2 | ● | NXE27-2 | | NXN27-2 | |
| β3 = 1° Standard shim | A16-1 | ● | A16-1 | ● | NXE22-1 | ● | NXN22-1 | ● | NXE27-1 | ● | NXN27-1 | ● |
| β3 = 0° | AE16-0 | ● | AN16-0 | ● | NXE22-0 | ● | NXN22-0 | ● | NXE27-0 | | NXN27-0 | |
| β3 = -1° | AE16-99 | ● | AN16-99 | ● | NXE22-99 | ● | NXN22-99 | ● | NXE27-99 | | NXN27-99 | |
| β3 = -2° | AE16-98 | ● | AN16-98 | ● | NXE22-98 | ● | NXN22-98 | ● | NXE27-98 | | NXN27-98 | |
| Applicable toolholders | CER--16T CNL--16 B-CER--16 | | CEL--16T CNR--16 B-CEL--16 | | CER--22T CNL--22 | | CEL--22T CNR--22 | | CER--27T CNL--27 | | CEL--27T CNR--27 | |

● : Line-up

# Selection of internal threading toolholders

## Relation between internal toolholders and machinable threads

In the tables starting from next page, the relationships between toolholders, inserts, threads to be machined, and shims to be replaced are shown. In these tables, the criteria are set as follows.

- **The minimum machining diameter.**
- **The L/D ratio of the toolholder.**
- **The lead angle of the thread.**
- **Cutting conditions**

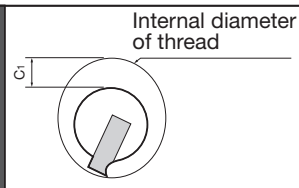
Especially when machining near the minimum machining diameter, the compensation for the lead angle should be done carefully.
Moreover, in threading, because chips generally can not be broken into small pieces, the shank size should be selected in consideration of adequate clearance ($C_1$).

**Symbols**

- ◯ Recommended
- • Usable
- 2 Needs replacing of the shim. "2" indicates "Change to the shim for 2° lead angle".
- Unusable

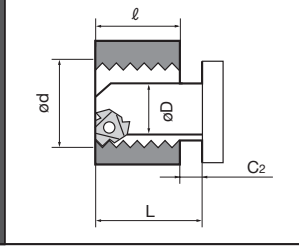


**Clearance $C_1$**

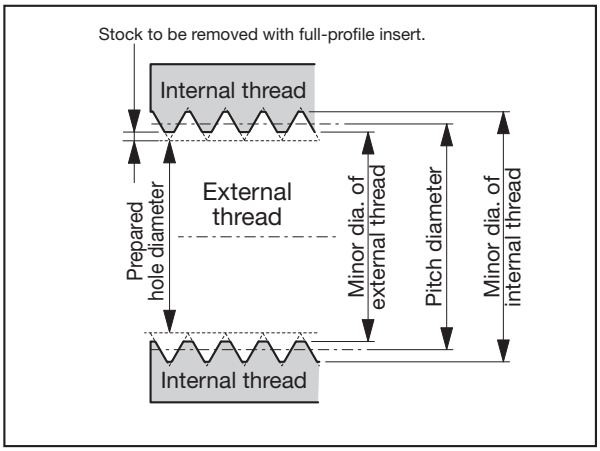



$C_1 \geq 3$ mm
( 1 mm for 6IR insert holders)

**Overhang ratio L/D**




| | |
|---|---|
| Steel shank | L/D ≤ 2→◯ |
| Carbide shank | L/D ≤ 3→◯ |




## How to use the tables

①Firstly, find the nominal thread diameter. Example: M35 X 1.5
②The table indicates that the lead angle is 0°48′.
③The Cat. No. of the insert to be used corresponds with IR15ISO.
④By following the row to the right, • and ◯ marks are found. The ◯ mark indicates the optimum toolholder type. The toolholders of • mark are usable, but less rigid because the shank diameter against the threading diameter is smaller than those of ◯ marked toolholder. In this example, CNR0025R16 and TCNR0020R16DT are the optimum toolholders. The insert Cat.No. is 16IR15ISO.
⑤In the case of M33 X 3 thread, the lead angle is 1°46′. By following the row to the right. 2 mark is found. This indicates that the shim should be replaced to 2° type. For calculation of the lead angle, refer to page B405.

## Metric fine screw thread (ISO)

(For full size of this table, see page B409.)

| Nominal size | Pitch | Effective diameter | Lead angle | Shank material | Steel shank | | | | | | | | | | | | | | | Carbide shank | | | | | | | | | "Tsuppari-Ichiban" | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Insert size | 6IR | | | | 11IR | | | | 16IR | | | | 22IR | | | | 6IR | | | | 11IR | | | | 16IR | | 16IR | | | 22IR | |
| | | | | Holder Cat. No. | SNR0006H06-2 | SNR0006H06-3 | SNR0008H06-2 | SNR0008H06-3 | SNR0010K11 | SNR0010K11-2 | SNR0013L11 | SNR0013L11-2 | SNR0016M16 | SNR0016M16-2 | CNR0020P16 | CNR0025R16 | CNR0032S16 | SNR0020Q22 | SNR0020Q22-2 | CNR0025R22 | CNR0032S22 | SNR0006K06SC-2 | SNR0006K06SC-3 | SNR0008K06SC-2 | SNR0008K06SC-3 | SNR0010M11SC | SNR0010M11SC-2 | SNR0012P11SC | SNR0012P11SC-2 | SNR0016R16SC | SNR0016R16SC-2 | TSNR0016Q16 | TCNR0020R16DT | TCNR0025S16DT | (TCNR0032T16DT) | TSNR0020R22 | TCNR0025S22DT |
| | | | | Insert Cat. No. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M33×1.5 | 1.5 | 32.03 | 0°51′ | IR15ISO | | | | | • | | • | | • | | ◯ | | | | | | | | | • | | • | | • | | • | ◯ | | | | |
| M33×2 | 2 | 31.7 | 1°09′ | IR20ISO | • | | • | | • | | • | | • | | ◯ | | | | | • | | • | | • | | • | | • | | • | ◯ | | | | |
| M33×3 | 3 | 31.05 | 1°46′ | IR30ISO | | | | | | | | | | | 2 | | | | | | | | | | | | | | | | • | 2 | | | | |
| M35×1.5 | 1.5 | 34.03 | 0°48′ | IR15ISO | | | | | • | | • | | • | | • | ◯ | | | | | | | | • | | • | | • | | • | ◯ | | | | |
| M36×1.5 | 1.5 | 35.03 | 0°47′ | IR15ISO | | | | | • | | • | | • | | • | ◯ | | | | | | | | • | | • | | • | | • | ◯ | | | | |
| M36×2 | 2 | 34.7 | 1°03′ | IR20ISO | | | | | | | | | | | • | ◯ | | | | • | | • | | • | | • | | • | | • | ◯ | | | | |
| M36×3 | 3 | 34.05 | 1°36′ | | | | | | | | | | | | | | | | | | | | | | | | | | | | • | 2 | | | | |
| M38×1.5 | 1.5 | 37 | | | | | | | | | | | | | | | | | | | | | | • | | • | | • | | • | • | ◯ | | | |

# Selection of Internal Toolholders—Relationship between thread sizes, toolholders, and inserts—Part 1

## Metric coarse screw thread (ISO)

| Nominal size | Pitch | Pitch diameter | Lead angle | Shank material | Steel shank | | | | | | | | | | | | | | | | Carbide shank | | | | | | | | "Tsuppari-Ichiban" | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Insert size | 6IR | | | | 11IR | | | | 16IR | | 22IR | | | | 27IR | | 6IR | | | | 11IR | | 16IR | | 22IR | |
| | | | | Holder Cat. No. / Insert Cat. No. | SNR0006H06-2 | SNR0006H06-3 | SNR0008H06-2 | SNR0008H06-3 | SNR0010K11-2 | SNR0010K11-3 | SNR0013L11-2 | SNR0013L11-3 | SNR0016M16-2 | SNR0016M16-3 | SNR0020Q22-2 | SNR0020Q22-3 | CNR0025R22 | CNR0032S22 | (CNR0040T22) | CNR0040T27 | (CNR0050U27) | SNR0006K06SC-2 | SNR0006K06SC-3 | SNR0008K06SC-2 | SNR0008K06SC-3 | SNR0010M11SC-2 | SNR0010M11SC-3 | SNR0016R16SC-2 | (SNR0016R16SC-3) | TCNR0025S22DT | (TCNR0032T22DT) |
| M10 | 1.5 | 9.03 | 3°02′ | IR15ISO | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M11 | 1.5 | 10.03 | 2°44′ | IR15ISO | | ○ | | | | | | | | | | | | | | | | ○ | | | | | | | | |
| M12 | 1.75 | 10.86 | 2°56′ | IR175ISO | | ○ | | | | | | | | | | | | | | | | ○ | | | | | | | | |
| M14 | 2 | 12.7 | 2°52′ | IR20ISO | | • | | ○ | | | | | | | | | | | | | | • | | ○ | | | | | | |
| M16 | 2 | 14.7 | 2°29′ | IR20ISO | • | | ○ | | | | | | | | | | | | | | • | | ○ | | | | | | | |
| M18 | 2.5 | 16.38 | 2°47′ | IR25ISO | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M20 | 2.5 | 18.38 | 2°29′ | IR25ISO | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M22 | 2.5 | 20.38 | 2°14′ | IR25ISO | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M24 | 3 | 22.05 | 2°29′ | IR30ISO | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M27 | 3 | 25.05 | 2°11′ | IR30ISO | | | | | | | | | ○ | | | | | | | | | | | | | | ○ | | | |
| M30 | 3.5 | 27.73 | 2°18′ | IR35ISO | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M33 | 3.5 | 30.73 | 2°05′ | IR35ISO | | | | | | | | | | | ○ | | | | | | | | | | | | | | | |
| M36 | 4 | 33.4 | 2°11′ | IR40ISO | | | | | | | | | | | ○ | | | | | | | | | | | | | | | |
| M39 | 4 | 36.4 | 2°00′ | IR40ISO | | | | | | | | | | | • | | 2 | | | | | | | | | | | | 2 | |
| M42 | 4.5 | 39.08 | 2°06′ | IR45ISO | | | | | | | | | | | • | | 2 | | | | | | | | | | | | 2 | |
| M45 | 4.5 | 42.08 | 1°57′ | IR45ISO | | | | | | | | | | | • | | 2 | | | | | | | | | | | | 2 | |
| M48 | 5 | 44.75 | 2°02′ | IR50ISO | | | | | | | | | | | • | | 2 | 2 | | | | | | | | | | | 2 | 2 |
| M52 | 5 | 48.75 | 1°52′ | IR50ISO | | | | | | | | | | | • | | 2 | 2 | | | | | | | | | | | 2 | 2 |
| M56 | 5.5 | 52.43 | 1°55′ | IR55ISO | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M60 | 5.5 | 56.43 | 1°47′ | IR55ISO | | | | | | | | | | | | | | | 2 | | | | | | | | | | | |
| M64 | 6 | 60.1 | 1°49′ | IR60ISO | | | | | | | | | | | | | | | 2 | | | | | | | | | | | |
| M68 | 6 | 64.1 | 1°42′ | IR60ISO | | | | | | | | | | | | | | | 2 | 2 | | | | | | | | | | |

2 : Change the shim to NXN22-2

2 : Change the shim to NXN27-2

2 : Change the shim to GXN22-2DT

## Metric fine screw thread (ISO)



| Nominal size | Pitch | Pitch diameter | Lead angle | Shank material | Steel shank | | | | | | | | | | Carbide shank | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Insert size | 6IR | | | | 11IR | | | | | | 6IR | | | | 11IR | | | | | |
| | | | | Holder Cat. No. / Insert Cat. No. | SNR0006H06-2 | SNR0006H06-3 | SNR0008H06-2 | SNR0008H06-3 | SNR0010K11 | SNR0010K11-2 | SNR0010K11-3 | SNR0013L11 | SNR0013L11-2 | SNR0013L11-3 | SNR0006K06SC-2 | SNR0006K06SC-3 | SNR0008K06SC-2 | SNR0008K06SC-3 | SNR0010M11SC | SNR0010M11SC-2 | SNR0010M11SC-3 | SNR0012P11SC | SNR0012P11SC-2 | SNR0012P11SC-3 |
| M9×0.75 | 0.75 | 8.51 | 1°36′ | IR075ISO | | | | | | | | | | | | | | | | | | | | |
| M9×1 | 1 | 8.32 | 2°11′ | IR10ISO | | | | | | | | | | | | | | | | | | | | |
| M10×0.75 | 0.75 | 9.51 | 1°26′ | IR075ISO | | | | | | | | | | | | | | | | | | | | |
| M10×1 | 1 | 9.35 | 1°57′ | IR10ISO | ○ | | | | | | | | | | ○ | | | | | | | | | |
| M10×1.25 | 1.25 | 9.19 | 2°29′ | IR125ISO | | | | | | | | | | | | | | | | | | | | |
| M11×0.75 | 0.75 | 10.51 | 1°18′ | IR075ISO | | | | | | | | | | | | | | | | | | | | |
| M11×1 | 1 | 10.35 | 1°46′ | IR10ISO | ○ | | | | | | | | | | ○ | | | | | | | | | |
| M12×1 | 1 | 11.35 | 1°36′ | IR10ISO | • | | ○ | | | | | | | | • | | ○ | | | | | | | |
| M12×1.25 | 1.25 | 11.19 | 2°02′ | IR125ISO | ○ | | | | | | | | | | ○ | | | | | | | | | |
| M12×1.5 | 1.5 | 11.03 | 2°29′ | IR15ISO | ○ | | | | | | | | | | ○ | | | | | | | | | |
| M14×1 | 1 | 13.35 | 1°22′ | IR10ISO | | | | | | | | | | | | | | | | | | | | |
| M14×1.25 | 1.25 | 13.19 | 1°44′ | IR125ISO | • | | ○ | | | | | | | | • | | ○ | | | | | | | |
| M14×1.5 | 1.5 | 13.03 | 2°06′ | IR15ISO | • | | ○ | | | | | | | | • | | ○ | | | | | | | |
| M15×1 | 1 | 14.35 | 1°16′ | IR10ISO | | | | | | | | | | | | | | | | | | | | |
| M15×1.5 | 1.5 | 14.03 | 1°57′ | IR15ISO | • | | ○ | | | | | | | | • | | ○ | | | | | | | |
| M16×1 | 1 | 15.35 | 1°11′ | IR10ISO | | | | | ○ | | | | | | | | | | | | | | | |
| M16×1.5 | 1.5 | 15.03 | 1°49′ | IR15ISO | • | | ○ | | | | | | | | • | | ○ | | | | | | | |
| M17×1 | 1 | 16.35 | 1°07′ | IR10ISO | | | | | ○ | | | | | | | | | | ○ | | | | | |
| M17×1.5 | 1.5 | 16.03 | 1°42′ | IR15ISO | • | | • | | | ○ | | | | | • | | ○ | | | | | | | |
| M18×1 | 1 | 17.35 | 1°03′ | IR10ISO | | | | | ○ | | | | | | | | | | ○ | | | | | |
| M18×1.5 | 1.5 | 17.03 | 1°36′ | IR15ISO | • | | • | | | ○ | | | | | • | | • | | | ○ | | | | |
| M18×2 | 2 | 16.7 | 2°11′ | IR20ISO | • | | • | | | ○ | | | | | • | | • | | | ○ | | | | |
| M20×1 | 1 | 19.35 | 0°57′ | IR10ISO | | | | | • | | | ○ | | | | | | | • | | | ○ | | |
| M20×1.5 | 1.5 | 19.03 | 1°26′ | IR15ISO | | | | | • | | | ○ | | | | | | | • | | | ○ | | |
| M20×2 | 2 | 18.7 | 1°57′ | IR20ISO | • | | • | | | ○ | | | | | • | | • | | | • | | | ○ | |

Note : The above tables show correspondence of internal toolholders at the time of setting clearance between thread and toolholder to 3 mm (1 mm in case of SN type) and the finishing stock to 0.1 mm.

# Metric fine screw thread (ISO)



| Nominal size | Pitch | Pitch diameter | Lead angle | Shank material | Steel shank | | | | | | | | | | | | Carbide shank | | | | | | | | | | | | "Tsuppari-Ichiban" | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Insert size | 6IR | | | | 11IR | | | | | 16IR | | | | | 6IR | | | | 11IR | | | | | 16IR | | | | 16IR | |
| | | | | Holder Cat. No. / Insert Cat. No. | SNR0006H06-2 | SNR0006H06-3 | SNR0008H06-2 | SNR0008H06-3 | SNR0010K11 | SNR0010K11-2 | SNR0013L11 | SNR0013L11-2 | SNR0013L11-3 | SNR0016M16 | SNR0016M16-2 | SNR0016M16-3 | CNR0020P16 | SNR0006K06SC-2 | SNR0006K06SC-3 | SNR0008K06SC-2 | SNR0008K06SC-3 | SNR0010M11SC | SNR0010M11SC-2 | SNR0010M11SC-3 | SNR0012P11SC | SNR0012P11SC-2 | SNR0012P11SC-3 | SNR0016R16SC | SNR0016R16SC-2 | (SNR0016R16SC-3) | TSNR0016Q16 | TCNR0020R16DT | TCNR0025S16DT |
| M22×1 | 1 | 21.35 | 0°51′ | IR10ISO | | | | | • | | ○ | | | | | | | | | | | • | | | ○ | | | | | | |
| M22×1.5 | 1.5 | 21.03 | 1°18′ | IR15ISO | • | | • | | • | | ○ | | | | | | | • | | • | | • | | | ○ | | | | | | |
| M22×2 | 2 | 20.7 | 1°46′ | IR20ISO | • | | • | | | • | | ○ | | | | | | • | | • | | | • | | | ○ | | | | | | |
| M24×1 | 1 | 23.35 | 0°47′ | IR10ISO | | | | | | | ○ | | | • | | | | | | | | • | | | ○ | | | | | • | |
| M24×1.5 | 1.5 | 23.03 | 1°11′ | IR15ISO | • | | • | | | | ○ | | | • | | | | • | | • | | • | | | ○ | | | | | • | |
| M24×2 | 2 | 22.07 | 1°39′ | IR20ISO | • | | • | | | • | | ○ | | | | | | • | | • | | | • | | | ○ | | | | | | |
| M25×1 | 1 | 24.35 | 0°45′ | IR10ISO | | | | | • | | ○ | | | • | | | | | | | | | | | ○ | | | | • | | |
| M25×1.5 | 1.5 | 24.03 | 1°08 | IR15ISO | • | | • | | • | | ○ | | | • | | | | • | | • | | | | | ○ | | | | • | | |
| M25×2 | 2 | 23.7 | 1°32′ | IR20ISO | • | | • | | | • | | ○ | | | • | | | • | | • | | | • | | | ○ | | | | | | |
| M26×1.5 | 1.5 | 25.03 | 1°06′ | IR15ISO | • | | • | | • | | • | | | ○ | | | | • | | • | | • | | | • | | | • | | | ○ |
| M27×1 | 1 | 26.35 | 0°42′ | IR10ISO | | | | | • | | • | | | ○ | | | | | | | | • | | | • | | | • | | | ○ |
| M27×1.5 | 1.5 | 26.03 | 1°03′ | IR15ISO | • | | • | | • | | • | | | ○ | | | | • | | • | | • | | | • | | | • | | | ○ |
| M27×2 | 2 | 25.7 | 1°25′ | IR20ISO | • | | • | | • | | • | | | ○ | | | | • | | • | | • | | | • | | | • | | | ○ |
| M28×1 | 1 | 27.35 | 0°40′ | IR10ISO | | | | | • | | • | | | ○ | | | | | | | | • | | | • | | | • | | | ○ |
| M28×1.5 | 1.5 | 27.03 | 1°01′ | IR15ISO | • | | • | | • | | • | | | ○ | | | | • | | • | | • | | | • | | | • | | | ○ |
| M28×2 | 2 | 26.7 | 1°22′ | IR20ISO | • | | • | | • | | • | | | ○ | | | | • | | • | | • | | | • | | | • | | | ○ |
| M30×1 | 1 | 29.35 | 0°37′ | IR10ISO | | | | | • | | • | | | ○ | | | | | | | | • | | | • | | | • | | | ○ |
| M30×1.5 | 1.5 | 29.03 | 0°57′ | IR15ISO | | | | | • | | • | | | ○ | | | | | | | | • | | | • | | | • | | | ○ |
| M30×2 | 2 | 28.7 | 1°16′ | IR20ISO | • | | • | | • | | • | | | ○ | | | | • | | • | | • | | | • | | | • | | | ○ |
| M30×3 | 3 | 28.05 | 1°57′ | IR30ISO | | | | | | | | | | | ○ | | | | | | | | | | | | ○ | | | | |
| M32×1.5 | 1.5 | 31.03 | 0°53′ | IR15ISO | | | | | • | | • | | | ○ | | | ○ | | | | | • | | | • | | | • | | ○ | |
| M32×2 | 2 | 30.07 | 1°11′ | IR20ISO | • | | • | | • | | • | | | ○ | | | ○ | • | | • | | • | | | • | | | • | | ○ | |

# Metric fine screw thread (ISO)



| Nominal size | Pitch | Pitch diameter | Lead angle | Shank material | Steel shank | | | | | | | | | | | | | | | Carbide shank | | | | | | | | | "Tsuppari-Ichiban" | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Insert size | 6IR | | | | 11IR | | | | 16IR | | | | 22IR | | | 6IR | | | | 11IR | | | 16IR | | 16IR | | | | 22IR | |
| | | | | Holder Cat. No. / Insert Cat. No. | SNR0006H06-2 | SNR0006H06-3 | SNR0008H06-2 | SNR0008H06-3 | SNR0010K11 | SNR0010K11-2 | SNR0013L11 | SNR0013L11-2 | SNR0016M16 | SNR0016M16-2 | CNR0020P16 | CNR0025R16 | CNR0032S16 | SNR0020Q22 | SNR0020Q22-2 | CNR0025R22 | CNR0032S22 | SNR0006K06SC-2 | SNR0006K06SC-3 | SNR0008K06SC-2 | SNR0008K06SC-3 | SNR0010M11SC | SNR0010M11SC-2 | SNR0012P11SC | SNR0012P11SC-2 | SNR0016R16SC | SNR0016R16SC-2 | TSNR0016Q16 | TCNR0020R16DT | TCNR0025S16DT | (TCNR0032T16DT) | TSNR0020R22 | TCNR0025S22DT |
| M33×1.5 | 1.5 | 32.03 | 0°51′ | IR15ISO | | | | | • | | • | | • | | ○ | | | | | | | | | | • | | • | | • | | • | ○ | | | |
| M33×2 | 2 | 31.7 | 1°09′ | IR20ISO | • | | • | | • | | • | | • | | • | ○ | | | | | • | | • | | • | | • | | • | | • | ○ | | | |
| M33×3 | 3 | 31.05 | 1°46′ | IR30ISO | | | | | | | | | | | 2 | | | | | | | | | | | | | | | | • | 2 | | | |
| M35×1.5 | 1.5 | 34.03 | 0°48′ | IR15ISO | | | | | • | | • | | • | | • | ○ | | | | | | | | | • | | • | | • | | • | ○ | | | |
| M36×1.5 | 1.5 | 35.03 | 0°47′ | IR15ISO | | | | | • | | • | | • | | • | ○ | | | | | | | | | • | | • | | • | | • | ○ | | | |
| M36×2 | 2 | 34.7 | 1°03′ | IR20ISO | • | | • | | • | | • | | • | | • | ○ | | | | | • | | • | | • | | • | | • | | • | ○ | | | |
| M36×3 | 3 | 34.05 | 1°36′ | IR30ISO | | | | | | | | | | | 2 | | | | | | | | | | | | | | | | • | 2 | | | |
| M38×1.5 | 1.5 | 37.03 | 0°44′ | IR15ISO | | | | | • | | • | | • | | • | ○ | | | | | | | | | • | | • | | • | | • | ○ | ○ | | |
| M39×1.5 | 1.5 | 38.03 | 0°43′ | IR15ISO | | | | | • | | • | | • | | • | ○ | | | | | | | | | • | | • | | • | | • | ○ | ○ | | |
| M39×2 | 2 | 38.7 | 0°58′ | IR20ISO | | | | | • | | • | | • | | • | ○ | | | | | | | | | • | | • | | • | | • | ○ | ○ | | |
| M39×3 | 3 | 37.05 | 1°29′ | IR30ISO | | | | | | | | | • | | • | ○ | | | | | | | | | | | | | • | | • | ○ | ○ | | |
| M40×1.5 | 1.5 | 39.03 | 0°42′ | IR15ISO | | | | | • | | • | | • | | • | ○ | | | | | | | | | • | | • | | • | | • | ○ | ○ | | |
| M40×2 | 2 | 37.8 | 0°57′ | IR20ISO | | | | | • | | • | | • | | • | ○ | | | | | | | | | • | | • | | • | | • | ○ | ○ | | |
| M40×3 | 3 | 38.05 | 1°26′ | IR30ISO | | | | | | | | | • | | • | ○ | | | | | | | | | | | | | • | | • | ○ | ○ | | |
| M42×1.5 | 1.5 | 41.03 | 0°40′ | IR15ISO | | | | | • | | • | | • | | • | ○ | | | | | | | | | • | | • | | • | | • | ○ | ○ | | |
| M42×2 | 2 | 40.7 | 0°54′ | IR20ISO | | | | | • | | • | | • | | • | ○ | | | | | | | | | • | | • | | • | | • | ○ | ○ | | |
| M42×3 | 3 | 40.05 | 1°22′ | IR30ISO | | | | | | | | | • | | • | ○ | | | | | | | | | | | | | • | | • | ○ | ○ | | |
| M42×4 | 4 | 39.4 | 1°51′ | IR40ISO | | | | | | | | | | | | | | 2 | | | | | | | | | | | | | | | | • | 2 |
| M45×1.5 | 1.5 | 44.03 | 0°37′ | IR15ISO | | | | | • | | • | | • | | • | • | ○ | | | | | | | | • | | • | | • | | • | ○ | ○ | | |
| M45×2 | 2 | 43.7 | 0°50′ | IR20ISO | | | | | • | | • | | • | | • | • | ○ | | | | | | | | • | | • | | • | | • | ○ | ○ | | |
| M45×3 | 3 | 43.05 | 1°16′ | IR30ISO | | | | | | | | | • | | • | • | ○ | | | | | • | | • | | • | | • | | • | | • | ○ | ○ | | |
| M45×4 | 4 | 42.4 | 1°43′ | IR40ISO | | | | | | | | | | | | | | 2 | | | | | | | | | | | | | | | | • | 2 |
| M48×1.5 | 1.5 | 47.03 | 0°35′ | IR15ISO | | | | | • | | • | | • | | • | • | ○ | | | | | | | | • | | • | | • | | • | ○ | ○ | | |
| M48×2 | 2 | 46.7 | 0°47′ | IR20ISO | | | | | • | | • | | • | | • | • | ○ | | | | | | | | • | | • | | • | | • | ○ | ○ | | |
| M48×3 | 3 | 46.05 | 1°11′ | IR30ISO | | | | | | | | | • | | • | • | ○ | | | | | | | | | | | | • | | • | ○ | ○ | | |
| M48×4 | 4 | 45.4 | 1°36′ | IR40ISO | | | | | | | | | | | | | | | 2 | | | | | | | | | | | | | | | • | 2 |

2 : Change the shim to AN16-2

2 : Change the shim to NXN22-2

2 : Change the shim to AN16-2DT

2 : Change the shim to GXN22-2DT

Note : The above tables show correspondence of internal toolholders at the time of setting clearance between thread and toolholder to 3 mm (1 mm in case of SN type) and the finishing stock to 0.1 mm.

# Metric fine screw thread (ISO)



| Nominal size | Pitch | Pitch diameter | Lead angle | Shank material | Steel shank | | | | | | | | | | | | | | | | | Carbide shank | | | | | | | | "Tsuppari-Ichiban" | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Insert size | 6IR | | | | 11IR | | | | 16IR | | | | | | 22IR | | | | | 6IR | | | 11IR | | | 16IR | | 16IR | | | 22IR | | |
| | | | | Holder Cat. No. / Insert Cat. No. | SNR0006H06-2 | SNR0006H06-3 | SNR0008H06-2 | SNR0008H06-3 | SNR0010K11 | SNR0010K11-2 | SNR0013L11 | SNR0013L11-2 | SNR0016M16 | SNR0016M16-2 | CNR0020P16 | CNR0025R16 | CNR0032S16 | (CNR0040T16) | (CNR0050U16) | SNR0020Q22 | SNR0020Q22-2 | CNR0025R22 | CNR0032S22 | (CNR0040T22) | SNR0006K06SC-2 | SNR0006K06SC-3 | SNR0008K06SC-2 | SNR0008K06SC-3 | SNR0010M11SC | SNR0010M11SC-2 | SNR0012P11SC | SNR0012P11SC-2 | SNR0016R16SC | SNR0016R16SC-2 | TSNR0016Q16 | TCNR0020R16DT | TCNR0025S16DT | (TCNR0032T16DT) | TSNR0020R22 | TCNR0025S22DT | (TCNR0032T22DT) |
| M50×1.5 | 1.5 | 49.03 | 0°33′ | IR15ISO | | | | | • | | • | | • | | • | • | ○ | • | | | | | | | | | | | | | | • | • | ○ | ○ | | | |
| M50×2 | 2 | 48.7 | 0°45′ | IR20ISO | | | | | • | | • | | • | | • | • | ○ | | | | | | | | | | | | | | | • | • | ○ | ○ | | | |
| M50×3 | 3 | 48.05 | 1°08′ | IR30ISO | | | | | | | | | • | | • | • | ○ | | | | | | | | | | | | | | | • | • | ○ | ○ | | | |
| M52×1.5 | 1.5 | 51.03 | 0°32′ | IR15ISO | | | | | • | | • | | • | | • | • | • | ○ | | | | | | | | | | | | | | • | • | ○ | ○ | | | |
| M52×2 | 2 | 50.7 | 0°43′ | IR20ISO | | | | | • | | • | | • | | • | • | • | ○ | | | | | | | | | | | | | | • | • | ○ | ○ | | | |
| M52×3 | 3 | 50.05 | 1°06′ | IR30ISO | | | | | | | | | • | | • | • | ○ | • | | | | | | | | | | | | | | • | • | ○ | ○ | | | |
| M52×4 | 4 | 49.4 | 1°29′ | IR40ISO | | | | | | | | | | | | | | | • | • | • | • | | | | | | | | | | | | | | • | • | ○ |
| M55×1.5 | 1.5 | 54.03 | 0°30′ | IR15ISO | | | | | • | | • | | • | | • | • | ○ | • | | | | | | | | | | | | | | • | • | ○ | ○ | | | |
| M55×2 | 2 | 53.7 | 0°41′ | IR20ISO | | | | | • | | • | | • | | • | • | • | ○ | | | | | | | | | | | | | | • | • | ○ | ○ | | | |
| M55×3 | 3 | 53.05 | 1°02′ | IR30ISO | | | | | | | | | • | | • | • | • | ○ | | | | | | | | | | | | | | • | • | ○ | ○ | | | |
| M55×4 | 4 | 52.4 | 1°24′ | IR40ISO | | | | | | | | | | | | | | | • | • | • | • | ○ | | | | | | | | | | | | | • | • | ○ |
| M56×1.5 | 1.5 | 55.03 | 0°30′ | IR15ISO | | | | | • | | • | | • | | • | • | • | ○ | | | | | | | | | | | | | | • | • | ○ | ○ | | | |
| M56×2 | 2 | 54.7 | 0°40′ | IR20ISO | | | | | • | | • | | • | | • | • | • | ○ | | | | | | | | | | | | | | • | • | ○ | ○ | | | |
| M56×3 | 3 | 54.05 | 1°01′ | IR30ISO | | | | | | | | | • | | • | • | • | ○ | | | | | | | | | | | | | | • | • | ○ | ○ | | | |
| M56×4 | 4 | 53.4 | 1°22′ | IR40ISO | | | | | | | | | | | | | | | • | • | • | • | ○ | | | | | | | | | | | | | • | • | ○ |
| M58×1.5 | 1.5 | 57.03 | 0°29′ | IR15ISO | | | | | • | | • | | • | | • | • | • | ○ | | | | | | | | | | | | | | • | • | ○ | ○ | | | |
| M58×2 | 2 | 56.7 | 0°39′ | IR20ISO | | | | | • | | • | | • | | • | • | • | ○ | | | | | | | | | | | | | | • | • | ○ | ○ | | | |
| M58×3 | 3 | 56.05 | 0°59′ | IR30ISO | | | | | | | | | • | | • | • | • | ○ | | | | | | | | | | | | | | • | • | ○ | ○ | | | |
| M58×4 | 4 | 55.4 | 1°19′ | IR40ISO | | | | | | | | | | | | | | | • | • | • | • | ○ | | | | | | | | | | | | | • | • | ○ |
| M60×1.5 | 1.5 | 59.03 | 0°28′ | IR15ISO | | | | | • | | • | | • | | • | • | • | ○ | | | | | | | | | | | | | | • | • | ○ | ○ | | | |
| M60×2 | 2 | 58.7 | 0°37′ | IR20ISO | | | | | • | | • | | • | | • | • | • | ○ | | | | | | | | | | | | | | • | • | ○ | ○ | | | |
| M60×3 | 3 | 58.05 | 0°57′ | IR30ISO | | | | | | | | | • | | • | • | • | ○ | | | | | | | | | | | | | | • | • | ○ | ○ | | | |
| M60×4 | 4 | 57.4 | 1°16′ | IR40ISO | | | | | | | | | | | | | | | • | • | • | • | ○ | | | | | | | | | | | | | • | • | ○ |

# Unified coarse screw thread (UNC)

| Nominal size | TPI | Pitch diameter | Lead angle | Shank material | Steel shank | | | | | | | | | | | | | | | | | | Carbide shank | | | | | | | | | "Tsuppari-Ichiban" | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Insert size | 11IR | | | | | | 16IR | | | 22IR | | | | | | 27IR | | | 11IR | | | | | | 16IR | | | 22IR | |
| | | | | Holder Cat. No. / Insert Cat. No. | SNR0010K11 | SNR0010K11-2 | SNR0010K11-3 | SNR0013L11 | SNR0013L11-2 | SNR0013L11-3 | SNR0016M16 | SNR0016M16-2 | SNR0016M16-3 | SNR0020Q22 | SNR0020Q22-2 | SNR0020Q22-3 | CNR0025R22 | CNR0032S22 | (CNR0040T22) | CNR0040T27 | (CNR0050U27) | (CNR0063V27) | SNR0010M11SC | SNR0010M11SC-2 | SNR0010M11SC-3 | SNR0012P11SC | SNR0012P11SC-2 | SNR0012P11SC-3 | SNR0016R16SC | SNR0016R16SC-2 | (SNR0016R16SC-3) | TCNR0025S22DT | (TCNR0032T22DT) |
| 7/16-14UNC | 14 | 9.93 | 3°20′ | (IR14UN) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1/2-13UNC | 13 | 11.43 | 3°07′ | (IR13UN) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9/16-12UNC | 12 | 12.91 | 2°59′ | IR12UN | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5/8-11UNC | 11 | 14.38 | 2°56′ | (IR11UN) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3/4-10UNC | 10 | 17.4 | 2°40′ | (IR10UN) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7/8-9UNC | 9 | 20.39 | 2°31′ | IR9UN | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1-8UNC | 8 | 23.34 | 2°29′ | IR8UN | | | | | | | | ○ | | | | | | | | | | | | | | | | | | | | | |
| 1 1/8-7UNC | 7 | 26.22 | 2°31′ | (IR7UN) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 1/4-7UNC | 7 | 29.39 | 2°15′ | (IR7UN) | | | | | | | | | | | ○ | | | | | | | | | | | | | | | | | | |
| 1 3/8-6UNC | 6 | 32.17 | 2°24′ | (IR6UN) | | | | | | | | | | | ○ | | | | | | | | | | | | | | | | | | |
| 1 1/2-6UNC | 6 | 35.35 | 2°11′ | (IR6UN) | | | | | | | | | | | ○ | | 2 | | | | | | | | | | | | | | | 2 | |
| 1 3/4-5UNC | 5 | 41.15 | 2°15′ | (IR5UN) | | | | | | | | | | | ○ | | 2 | | | | | | | | | | | | | | | 2 | |
| 2-4 1/2UNC | 4.5 | 47.14 | 2°11′ | (IR45UN) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 1/4-4 1/2UNC | 4.5 | 53.49 | 1°55′ | (IR45UN) | | | | | | | | | | | | | | | 2 | | | | | | | | | | | | | | |
| 2 1/2-4UNC | 4 | 59.38 | 1°57′ | (IR4UN) | | | | | | | | | | | | | | | 2 | | | | | | | | | | | | | | |
| 2 3/4-4UNC | 4 | 65.73 | 1°46′ | (IR4UN) | | | | | | | | | | | | | | | 2 | 2 | | | | | | | | | | | | | |
| 3-4UNC | 4 | 72.08 | 1°36′ | (IR4UN) | | | | | | | | | | | | | | | 2 | 2 | | | | | | | | | | | | | |
| 3 1/4-4UNC | 4 | 78.43 | 1°29′ | (IR4UN) | | | | | | | | | | | | | | | • | • | ○ | | | | | | | | | | | | |
| 3 1/2-4UNC | 4 | 84.78 | 1°22′ | (IR4UN) | | | | | | | | | | | | | | | • | • | ○ | | | | | | | | | | | | |
| 3 3/4-4UNC | 4 | 91.13 | 1°16′ | (IR4UN) | | | | | | | | | | | | | | | • | • | ○ | | | | | | | | | | | | |
| 4-4UNC | 4 | 97.48 | 1°11′ | (IR4UN) | | | | | | | | | | | | | | | • | • | ○ | | | | | | | | | | | | |

2 : Change the shim to NXN22-2

2 : Change the shim to NXN27-2

2 : Change the shim to GXN22-2DT

Note : The above tables show correspondence of internal toolholders at the time of setting clearance between thread and toolholder to 3 mm (1 mm in case of SN type) and the finishing stock to 0.1 mm.

## Unified fine screw thread (UNF)

| Nominal size | TPI | Pitch diameter | Lead angle | Shank material | Steel shank | | | | | | | | | | Carbide shank | | | | | | | | "Tsuppari-Ichiban" | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Insert size | 6IR | | | | 11IR | | 16IR | | | | 6IR | | | | 11IR | | | | 16IR | | 16IR | | |
| | | | | Holder Cat. No. / Insert Cat. No. | SNR0006H06-2 | SNR0006H06-3 | SNR0008H06-2 | SNR0008H06-3 | SNR0010K11-2 | SNR0013L11-2 | SNR0016M16 | SNR0016M16-2 | CNR0020P16 | CNR0025R16 | SNR0006K06SC-2 | SNR0006K06SC-3 | SNR0008K06SC-2 | SNR0008K06SC-3 | SNR0010M11SC | SNR0010M11SC-2 | SNR0012P11SC | SNR0012P11SC-2 | SNR0016R16SC | SNR0016R16SC-2 | TSNR0016Q16 | TCNR0020R16DT | TCNR0025S16DT |
| 3/8-24UNF | 24 | 8.84 | 2°11′ | (IR24UN) | | | | | | | | | | | | | | | | | | | | | |
| | | | | IRA60 | | | | | | | | | | | | | | | | | | | | | |
| 7/16-20UNF | 20 | 10.29 | 2°15′ | (IR20UN) | | | | | | | | | | | | | | | | | | | | | |
| | | | | IRA60 | ○ | | | | | | | | | | ○ | | | | | | | | | | |
| 1/2-20UNF | 20 | 11.87 | 1°57′ | (IR20UN) | | | | | | | | | | | | | | | | | | | | | |
| | | | | IRA60 | • | | ○ | | | | | | | | • | | ○ | | | | | | | | |
| 9/16-18UNF | 18 | 13.37 | 1°55′ | (IR18UN) | | | | | | | | | | | | | | | | | | | | | |
| | | | | IRA60 | • | | ○ | | | | | | | | • | | ○ | | | | | | | | |
| 5/8-18UNF | 18 | 14.96 | 1°43′ | (IR18UN) | | | | | | | | | | | | | | | | | | | | | |
| | | | | IRA60 | • | | ○ | | | | | | | | • | | ○ | | | | | | | | |
| 3/4-16UNF | 16 | 18.02 | 1°36′ | IR16UN | | | | | ○ | | | | | | | | | | | ○ | | | | | |
| 7/8-14UNF | 14 | 21.05 | 1°34′ | IR14UN | | | | | • | ○ | | | | | | | | | | • | | ○ | | | |
| 1-12UNF | 12 | 24.03 | 1°36′ | IR12UN | | | | | | | | ○ | | | | | | | | | | | ○ | | |
| 1 1/8-12UNF | 12 | 27.2 | 1°25′ | IR12UN | | | | | | | ○ | | | | | | | | | | | | ○ | ○ | |
| 1 1/4-12UNF | 12 | 30.38 | 1°16′ | IR12UN | | | | | | | • | | ○ | | | | | | | | | | ○ | • | ○ | |
| 1 3/8-12UNF | 12 | 33.55 | 1°09′ | IR12UN | | | | | | | • | | • | ○ | | | | | | | | | ○ | • | • | ○ |
| 1 1/2-12UNF | 12 | 36.73 | 1°03′ | IR12UN | | | | | | | • | | • | ○ | | | | | | | | | ○ | • | • | ○ |

## Whitworth coarse screw thread (W)

| Nominal size | TPI | Pitch | Pitch diameter | Lead angle | Shank material | Steel shank | | | | | | | | | Carbide shank | | | "Tsuppari-Ichiban" | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Insert size | 16IR | | 22IR | | | | | 27IR | | 16IR | | | 22IR | |
| | | | | | Holder Cat. No. / Insert Cat. No. | SNR0016M16-2 | SNR0016M16-3 | SNR0020Q22-2 | SNR0020Q22-3 | CNR0025R22 | CNR0032S22 | (CNR0040T22) | CNR0040T27 | (CNR0050U27) | SNR0016R16SC | SNR0016R16SC-2 | (SNR0016R16SC-3) | TCNR0025S22DT | (TCNR0032T22DT) |
| W7/16 | 14 | 1.81 | 9.95 | 3°19′ | (IR14W) | | | | | | | | | | | | | | |
| W1/2 | 12 | 2.12 | 11.35 | 3°24′ | IR12W | | | | | | | | | | | | | | |
| W9/16 | 12 | 2.12 | 12.93 | 2°59′ | IR12W | | | | | | | | | | | | | | |
| W5/8 | 11 | 2.31 | 14.4 | 2°55′ | IR11W | | | | | | | | | | | | | | |
| W3/4 | 10 | 2.54 | 17.42 | 2°39′ | IR10W | | | | | | | | | | | | | | |
| W7/8 | 9 | 2.82 | 20.42 | 2°31′ | (IR9W) | | | | | | | | | | | | | | |
| W1 | 8 | 3.18 | 23.37 | 2°29′ | IR8W | ○ | | | | | | | | | | | | | |
| W1 1/8 | 7 | 3.63 | 26.25 | 2°31′ | (IR7W) | | | | | | | | | | | | | | |
| W1 1/4 | 7 | 3.63 | 29.43 | 2°15′ | (IR7W) | | | ○ | | | | | | | | | | | |
| W1 3/8 | 6 | 4.23 | 32.21 | 2°24′ | (IR6W) | | | ○ | | | | | | | | | | | |
| W1 1/2 | 6 | 4.23 | 35.39 | 2°11′ | (IR6W) | | | ○ | | | | | | | | | | | |
| W1 5/8 | 5 | 5.08 | 38.02 | 2°26′ | (IR5W) | | | • | | 2 | | | | | | | | 2 | |
| W1 3/4 | 5 | 5.08 | 41.2 | 2°15′ | (IR5W) | | | • | | 2 | | | | | | | | 2 | |
| W1 7/8 | 4.5 | 5.64 | 44.01 | 2°20′ | (IR45W) | | | | | | | | | | | | | | |
| W2 | 4.5 | 5.64 | 47.19 | 2°11′ | (IR45W) | | | | | | | | | | | | | | |
| W2 1/4 | 4 | 6.35 | 53.08 | 2°11′ | (IR4W) | | | | | | | | | | | | | | |
| W2 1/2 | 4 | 6.35 | 59.43 | 1°57′ | (IR4W) | | | | | | | | 2 | | | | | | |

2 : Change the shim to NXN22-2

2 : Change the shim to NXN27-2

2 : Change the shim to GXN22-2DT

Note : The above tables show correspondence of internal toolholders at the time of setting clearance between thread and toolholder to 3 mm (1 mm in case of SN type) and the finishing stock to 0.1 mm.

# Whitworth fine screw thread (W)

1/2

| Nominal size | TPI | Pitch | Pitch diameter | Lead angle | Shank material | Steel shank | | | | | | | | | | | | | Carbide shank | | | | "Tsuppari-Ichiban" | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Insert size | 6IR | | | | 11IR | | | | 16IR | | | | | 11IR | | 16IR | | 16IR | | |
| | | | | | Holder Cat. No. / Insert Cat. No. | SNR0006H06-2 | SNR0006H06-3 | SNR0008H06-2 | SNR0008H06-3 | SNR0010K11 | SNR0010K11-2 | SNR0013L11 | SNR0013L11-2 | SNR0016M16 | SNR0016M16-2 | SNR0016M16-3 | CNR0020P16 | CNR0025R16 | SNR0010M11SC-2 | SNR0012P11SC-2 | SNR0016R16SC | SNR0016R16SC-2 | TSNR0016Q16 | TCNR0020R16DT | TCNR0025S16DT |
| W13 | 16 | 1.588 | 11.98 | 2°25′ | (IR16W) | | | | | | | | | | | | | | | | | | | | |
| W13.5 | 16 | 1.588 | 12.48 | 2°19′ | (IR16W) | | | | | | | | | | | | | | | | | | | | |
| W14 | 16 | 1.588 | 12.98 | 2°14′ | (IR16W) | | | | | | | | | | | | | | | | | | | | |
| W14.5 | 16 | 1.588 | 13.48 | 2°09′ | (IR16W) | | | | | | | | | | | | | | | | | | | | |
| W15 | 16 | 1.588 | 13.98 | 2°04′ | (IR16W) | | | | | | | | | | | | | | | | | | | | |
| W16 | 14 | 1.814 | 14.84 | 2°14′ | (IR14W) | | | | | | | | | | | | | | | | | | | | |
| W17 | 14 | 1.814 | 15.84 | 2°05′ | (IR14W) | | | | | | ○ | | | | | | | | | | | | | | |
| W18 | 14 | 1.814 | 16.84 | 1°58′ | (IR14W) | | | | | | ○ | | | | | | | | ○ | | | | | | |
| W19 | 12 | 2.117 | 17.65 | 2°11′ | IR12W | | | | | | | | | | | | | | | | | | | | |
| W20 | 12 | 2.117 | 18.65 | 2°04′ | IR12W | | | | | | | | | | | | | | | | | | | | |
| W21 | 12 | 2.117 | 19.65 | 1°58′ | IR12W | | | | | | | | | | | | | | | | | | | | |
| W22 | 12 | 2.117 | 20.65 | 1°52′ | IR12W | | | | | | | | | | | | | | | | | | | | |
| W23 | 10 | 2.54 | 21.37 | 2°10′ | IR10W | | | | | | | | | | | | | | | | | | | | |
| W24 | 10 | 2.54 | 22.37 | 2°04′ | IR10W | | | | | | | | | | | | | | | | | | | | |
| W25 | 10 | 2.54 | 23.37 | 1°59′ | IR10W | | | | | | | | | | ○ | | | | | | | | | | |
| W26 | 10 | 2.54 | 24.37 | 1°54′ | IR10W | | | | | | | | | | ○ | | | | | | | ○ | | | |
| W28 | 9 | 2.822 | 26.19 | 1°58′ | (IR9W) | | | | | | | | | | ○ | | | | | | | ○ | | | |
| W30 | 9 | 2.822 | 28.19 | 1°50′ | (IR9W) | | | | | | | | | | ○ | | | | | | | ○ | | | |
| W32 | 9 | 2.822 | 30.19 | 1°42′ | (IR9W) | | | | | | | | | | • | | [2] | | | | | • | | [2] | |
| W34 | 8 | 3.175 | 31.97 | 1°49′ | IR8W | | | | | | | | | | • | | [2] | | | | | • | | [2] | |
| W35 | 8 | 3.175 | 32.97 | 1°45′ | IR8W | | | | | | | | | | • | | [2] | | | | | • | | [2] | |
| W36 | 8 | 3.175 | 33.97 | 1°42′ | IR8W | | | | | | | | | | • | | 2 | [2] | | | | • | | 2 | [2] |
| W38 | 8 | 3.175 | 35.97 | 1°37′ | IR8W | | | | | | | | | | • | | 2 | [2] | | | | • | | 2 | [2] |
| W40 | 8 | 3.175 | 37.97 | 1°31′ | IR8W | | | | | | | | | | • | | 2 | [2] | | | | • | | 2 | [2] |
| W42 | 8 | 3.175 | 39.97 | 1°27′ | IR8W | | | | | | | | | | | | • | ○ | | | ○ | | | • | ○ |

[2] : Change the shim to AN16-2

[2] : Change the shim to AN16-2DT

# Whitworth fine screw thread (W)

2/2

| Nominal size | TPI | Pitch | Pitch diameter | Lead angle | Shank material | Steel shank | | | | | | | | | "Tsuppari-Ichiban" | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Insert size | 22IR | | | | | | | 27IR | | | 22IR | |
| | | | | | Holder Cat. No. / Insert Cat. No. | SNR0020Q22 | SNR0020Q22-2 | CNR0025R22 | CNR0032S22 | (CNR0040T22) | (CNR0050U22) | (CNR0063V22) | CNR0040T27 | (CNR0050U27) | (CNR0063V27) | TSNR0020R22 | TCNR0025S22DT | (TCNR0032T22DT) |
| W44 | 7 | 3.629 | 41.68 | 1°35′ | (22IR7W) | | • | [2] | | | | | | | | • | [2] | |
| W45 | 7 | 3.629 | 42.68 | 1°33′ | (22IR7W) | | • | [2] | | | | | | | | • | [2] | |
| W46 | 7 | 3.629 | 43.68 | 1°31′ | (22IR7W) | | • | [2] | | | | | | | | • | [2] | |
| W48 | 7 | 3.629 | 45.68 | 1°27′ | (22IR7W) | • | | • | ○ | | | | | | | • | • | ○ |
| W50 | 7 | 3.629 | 47.68 | 1°23′ | (22IR7W) | • | | • | ○ | | | | | | | • | • | ○ |
| W52 | 7 | 3.629 | 49.68 | 1°20′ | (22IR7W) | • | | • | ○ | | | | | | | • | • | ○ |
| W55 | 6 | 4.233 | 52.29 | 1°29′ | (22IR6W) | • | | • | ○ | | | | | | | • | • | ○ |
| W58 | 6 | 4.233 | 55.29 | 1°24′ | (22IR6W) | • | | • | • | ○ | | | | | | • | • | ○ |
| W60 | 6 | 4.233 | 57.29 | 1°21′ | (22IR6W) | • | | • | • | ○ | | | | | | • | • | ○ |
| W62 | 6 | 4.233 | 59.29 | 1°18′ | (22IR6W) | • | | • | • | ○ | | | | | | • | • | ○ |
| W65 | 6 | 4.233 | 62.29 | 1°14′ | (22IR6W) | • | | • | • | ○ | | | | | | • | • | ○ |
| W68 | 6 | 4.233 | 65.29 | 1°11′ | (22IR6W) | • | | • | • | • | ○ | | | | | • | • | ○ |
| W70 | 6 | 4.233 | 67.29 | 1°09′ | (22IR6W) | • | | • | • | • | ○ | | | | | • | • | ○ |
| W72 | 6 | 4.233 | 69.29 | 1°07′ | (22IR6W) | • | | • | • | • | ○ | | | | | • | • | ○ |
| W75 | 5 | 5.08 | 71.75 | 1°17′ | (22IR5W) | • | | • | • | • | ○ | | | | | • | • | ○ |
| W78 | 5 | 5.08 | 74.75 | 1°14′ | (22IR5W) | • | | • | • | • | ○ | | | | | • | • | ○ |
| W80 | 5 | 5.08 | 76.75 | 1°12′ | (22IR5W) | • | | • | • | • | ○ | | | | | • | • | ○ |
| W82 | 5 | 5.08 | 78.75 | 1°11′ | (22IR5W) | • | | • | • | • | • | ○ | | | | • | • | ○ |
| W85 | 5 | 5.08 | 81.75 | 1°08′ | (22IR5W) | • | | • | • | • | • | ○ | | | | • | • | ○ |
| W88 | 5 | 5.08 | 84.75 | 1°06′ | (22IR5W) | • | | • | • | • | • | ○ | | | | • | • | ○ |
| W90 | 5 | 5.08 | 86.75 | 1°04′ | (22IR5W) | • | | • | • | • | • | ○ | | | | • | • | ○ |
| W92 | 5 | 5.08 | 88.75 | 1°03′ | (22IR5W) | • | | • | • | • | • | ○ | | | | • | • | ○ |
| W95 | 5 | 5.08 | 91.75 | 1°01′ | (22IR5W) | • | | • | • | • | • | ○ | | | | • | • | ○ |
| W98 | 5 | 5.08 | 94.75 | 0°59′ | (22IR5W) | • | | • | • | • | • | ○ | | | | • | • | ○ |
| W100 | 5 | 5.08 | 96.75 | 0°57′ | (22IR5W) | • | | • | • | • | • | ○ | | | | • | • | ○ |
| W105 | 5 | 5.08 | 101.75 | 0°55′ | (22IR5W) | • | | • | • | • | • | ○ | | | | • | • | ○ |
| W110 | 4 | 6.35 | 105.93 | 0°52′ | (27IR4W) | | | | | | | | • | • | ○ | | | |

[2] : Change the shim to NXN22-2

[2] : Change the shim to GXN22-2

Note : The above tables show correspondence of internal toolholders at the time of setting clearance between thread and toolholder to 3 mm (1 mm in case of SN type) and the finishing stock to 0.1 mm.

# 30° trapezoidal thread (TR)



| Nominal size | Pitch | Pitch diameter | Lead angle | Shank material | Steel shank | | | | | | | | | | | | | | Carbide shank | | | "Tsuppari-Ichiban" | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Insert size | 16IR | | | | | | 22IR | | | | | 27IR | | | 16IR | | | 16IR | | | | 22IR | | |
| | | | | Holder Cat. No. / Insert Cat. No. | SNR0016M16 | SNR0016M16-2 | SNR0016M16-3 | CNR0020P16 | CNR0025R16 | CNR0032S16 | CNR0040T16 | CNR0050U16 | SNR0020Q22 | SNR0020Q22-2 | SNR0020Q22-3 | CNR0025R22 | CNR0032S22 | CNR0040T27 | (CNR0050U27) | SNR0016R16SC | SNR0016R16SC-2 | (SNR0016R16SC-3) | TSNR0016Q16 | TCNR0020R16DT | TCNR0025S16DT | (TCNR0032T16DT) | TSNR0020R22 | TCNR0025S22DT | (TCNR0032T22DT) |
| TR22×3 | 3 | 20.5 | 2°40′ | IR30TR | | | | | | | | | | | | | | | | | | | | | | | | |
| TR24×5 | 5 | 21.5 | 4°14′ | IR50TR | | | | | | | | | | | | | | | | | | | | | | | | |
| TR24×3 | 3 | 22.5 | 2°26′ | IR30TR | | | | | | | | | | | | | | | | | | | | | | | | |
| TR26×5 | 5 | 23.5 | 3°52′ | IR50TR | | | | | | | | | | | | | | | | | | | | | | | | |
| TR26×3 | 3 | 24.5 | 2°14′ | IR30TR | | ○ | | | | | | | | | | | | | | | | | | | | | | |
| TR28×5 | 5 | 25.5 | 3°34′ | IR50TR | | | | | | | | | | | | | | | | | | | | | | | | |
| TR28×3 | 3 | 26.5 | 2°04′ | IR30TR | | • | | | | | | | | | | | | | | ○ | | | | | | | | |
| TR30×6 | 6 | 27 | 4°03′ | IR60TR | | | | | | | | | | | | | | | | | | | | | | | | |
| TR30×3 | 3 | 28.5 | 1°55′ | IR30TR | | • | | | | | | | | | | | | | | ○ | | | | | | | | |
| TR32×6 | 6 | 29 | 3°46′ | IR60TR | | | | | | | | | | | | | | | | | | | | | | | | |
| TR32×3 | 3 | 30.5 | 1°48′ | IR30TR | | • | | [2] | | | | | | | | | | | | • | | | | [2] | | | | |
| TR34×6 | 6 | 31 | 3°32′ | IR60TR | | | | | | | | | | | | | | | | | | | | | | | | |
| TR34×3 | 3 | 32.5 | 1°41′ | IR30TR | | • | | [2] | | | | | | | | | | | | • | | | | [2] | | | | |
| TR36×6 | 6 | 33 | 3°19′ | IR60TR | | | | | | | | | | | | | | | | | | | | | | | | |
| TR36×3 | 3 | 34.5 | 1°35′ | IR30TR | | • | | 2 | [2] | | | | | | | | | | | • | | | | [2] | [2] | | | |
| TR38×3 | 3 | 36.5 | 1°30′ | IR30TR | | • | | 2 | [2] | | | | | | | | | | | • | | | | [2] | [2] | | | |
| TR40×3 | 3 | 38.5 | 1°25′ | IR30TR | • | | | • | ○ | | | | | | | | | | ○ | | | | • | ○ | | | | |
| TR42×3 | 3 | 40.5 | 1°21′ | IR30TR | • | | | • | ○ | | | | | | | | | | ○ | | | | • | ○ | | | | |
| TR44×3 | 3 | 42.5 | 1°17′ | IR30TR | • | | | • | • | ○ | | | | | | | | | ○ | | | | • | • | ○ | | | |
| TR46×3 | 3 | 44.5 | 1°14′ | IR30TR | • | | | • | • | ○ | | | | | | | | | ○ | | | | • | • | ○ | | | |
| TR48×3 | 3 | 46.5 | 1°11′ | IR30TR | • | | | • | • | ○ | | | | | | | | | ○ | | | | • | • | ○ | | | |
| TR50×3 | 3 | 48.5 | 1°08′ | IR30TR | • | | | • | • | ○ | | | | | | | | | ○ | | | | • | • | ○ | | | |
| TR52×3 | 3 | 50.5 | 1°05′ | IR30TR | • | | | • | • | • | ○ | | | | | | | | ○ | | | | • | • | ○ | | | |
| TR55×3 | 3 | 53.5 | 1°01′ | IR30TR | • | | | • | • | • | ○ | | | | | | | | ○ | | | | • | • | ○ | | | |
| TR60×3 | 3 | 58.5 | 0°56′ | IR30TR | • | | | • | • | • | ○ | | | | | | | | ○ | | | | • | • | ○ | | | |

[2] : Change the shim to AN16-2

[2] : Change the shim to AN16-2DT

# 30° trapezoidal thread (TR)



| Nominal size | Pitch | Pitch diameter | Lead angle | Shank material | Steel shank | | | | | | | | | | | | | | | | Carbide shank | | | "Tsuppari-Ichiban" | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Insert size | 16IR | | | | | | 22IR | | | | | | | 27IR | | | 16IR | | | 16IR | | | | 22IR | | |
| | | | | Holder Cat. No. / Insert Cat. No. | SNR0016M16 | SNR0016M16-2 | SNR0016M16-3 | CNR0020P16 | CNR0025R16 | CNR0032S16 | SNR0020Q22 | SNR0020Q22-2 | SNR0020Q22-3 | CNR0025R22 | CNR0032S22 | (CNR0040T22) | (CNR0050U22) | (CNR0063V22) | CNR0040T27 | (CNR0050U27) | (CNR0063V27) | SNR0016R16SC | SNR0016R16SC-2 | (SNR0016R16SC-3) | TSNR0016Q16 | TCNR0020R16DT | TCNR0025S16DT | (TCNR0032T16DT) | TSNR0020R22 | TCNR0025S22DT | (TCNR0032T22DT) |
| TR65×4 | 4 | 63 | 1°09′ | IR40TR | | | | | | | • | | | • | • | • | ○ | | | | | | | | | | • | • | ○ |
| TR70×4 | 4 | 68 | 1°04′ | IR40TR | | | | | | | • | | | • | • | • | ○ | | | | | | | | | | • | • | ○ |
| TR75×4 | 4 | 73 | 1°00′ | IR40TR | | | | | | | • | | | • | • | • | ○ | | | | | | | | | | • | • | ○ |
| TR80×4 | 4 | 78 | 0°56′ | IR40TR | | | | | | | • | | | • | • | • | • | ○ | | | | | | | | | • | • | ○ |
| TR85×4 | 4 | 83 | 0°53′ | IR40TR | | | | | | | • | | | • | • | • | • | ○ | | | | | | | | | • | • | ○ |
| TR90×4 | 4 | 88 | 0°50′ | IR40TR | | | | | | | • | | | • | • | • | • | ○ | | | | | | | | | • | • | ○ |
| TR95×4 | 4 | 93 | 0°47′ | IR40TR | | | | | | | • | | | • | • | • | • | ○ | | | | | | | | | • | • | ○ |
| TR100×4 | 4 | 98 | 0°45′ | IR40TR | | | | | | | • | | | • | • | • | • | ○ | | | | | | | | | • | • | ○ |
| TR105×4 | 4 | 103 | 0°42′ | IR40TR | | | | | | | • | | | • | • | • | • | ○ | | | | | | | | | • | • | ○ |
| TR110×4 | 4 | 108 | 0°41′ | IR40TR | | | | | | | • | | | • | • | • | • | ○ | | | | | | | | | • | • | ○ |
| TR115×6 | 6 | 112 | 0°59′ | IR60TR | | | | | | | | | | | | | | | • | • | ○ | | | | | | | | |
| TR120×6 | 6 | 117 | 0°56′ | IR60TR | | | | | | | | | | | | | | | • | • | ○ | | | | | | | | |
| TR125×6 | 6 | 122 | 0°54′ | IR60TR | | | | | | | | | | | | | | | • | • | ○ | | | | | | | | |
| TR130×6 | 6 | 127 | 0°52′ | IR60TR | | | | | | | | | | | | | | | • | • | ○ | | | | | | | | |
| TR135×6 | 6 | 132 | 0°50′ | IR60TR | | | | | | | | | | | | | | | • | • | ○ | | | | | | | | |
| TR140×6 | 6 | 137 | 0°48′ | IR60TR | | | | | | | | | | | | | | | • | • | ○ | | | | | | | | |
| TR145×6 | 6 | 142 | 0°46′ | IR60TR | | | | | | | | | | | | | | | • | • | ○ | | | | | | | | |
| TR150×6 | 6 | 147 | 0°45′ | IR60TR | | | | | | | | | | | | | | | • | • | ○ | | | | | | | | |
| TR155×6 | 6 | 152 | 0°43′ | IR60TR | | | | | | | | | | | | | | | • | • | ○ | | | | | | | | |
| TR160×6 | 6 | 157 | 0°42′ | IR60TR | | | | | | | | | | | | | | | • | • | ○ | | | | | | | | |
| TR165×6 | 6 | 162 | 0°41′ | IR60TR | | | | | | | | | | | | | | | • | • | ○ | | | | | | | | |
| TR170×6 | 6 | 167 | 0°39′ | IR60TR | | | | | | | | | | | | | | | • | • | ○ | | | | | | | | |

Note : The above tables show correspondence of internal toolholders at the time of setting clearance between thread and toolholder to 3 mm (1 mm in case of SN type) and the finishing stock to 0.1 mm.

## Parallel pipe thread (G) This table is also applied to PF, Rp, and PS type threads.

| Nominal size | TPI | Pitch | Pitch diameter | Lead angle | Shank material | Steel shank | | | | | | | | | | | | Carbide shank | | | | | | | | | "Tsuppari-Ichiban" | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Insert size | 6IR | | 11IR | | | | 16IR | | | | | | 6IR | | | | 11IR | | | | 16IR | | 16IR | | | |
| | | | | | Holder Cat. No. / Insert Cat. No. | SNR0006H06-2 | SNR0008H06-2 | SNR0010K11 | SNR0010K11-2 | SNR0013L11 | SNR0013L11-2 | SNR0016M16 | SNR0016M16-2 | CNR0020P16 | CNR0025R16 | CNR0032S16 | (CNR0040T16) | (CNR0050U16) | SNR0006K06SC-2 | SNR0006K06SC-3 | SNR0008K06SC-2 | SNR0008K06SC-3 | SNR0010M11SC | SNR0010M11SC-2 | SNR0012P11SC | SNR0012P11SC-2 | SNR0016R16SC | SNR0016R16SC-2 | TSNR0016Q16 | TCNR0020R16DT | TCNR0025S16DT | (TCNR0032T16DT) |
| G1/4 | 19 | 1.34 | 12.30 | 1°59′ | IR19W | • | ○ | | | | | | | | | | | • | | ○ | | | | | | | | | | |
| G3/8 | 19 | 1.34 | 15.81 | 1°33′ | IR19W | • | • | | ○ | | | | | | | | | • | | ○ | | | | | | | | | | |
| G1/2 | 14 | 1.81 | 19.79 | 1°40′ | IR14W | | | | • | | ○ | | | | | | | | | | | | • | | ○ | | | | | |
| G5/8 | 14 | 1.81 | 21.75 | 1°31′ | IR14W | | | | • | | ○ | | | | | | | | | | | | • | | ○ | | | | | |
| G3/4 | 14 | 1.81 | 25.28 | 1°18′ | IR14W | | | • | | • | | ○ | | | | | | | | | | • | | • | | ○ | | ○ | | | |
| G7/8 | 14 | 1.81 | 29.04 | 1°08′ | IR14W | | | • | | • | | • | | ○ | | | | | | | | • | | • | | ○ | | • | ○ | | |
| G1 | 11 | 2.31 | 31.77 | 1°20′ | IR11W | | | | | | | • | | ○ | | | | | | | | | | | | ○ | | • | ○ | | |
| G1-1/8 | 11 | 2.31 | 36.42 | 1°09′ | IR11W | | | | | | | • | | • | ○ | | | | | | | | | | | ○ | | • | • | ○ | |
| G1-1/4 | 11 | 2.31 | 40.43 | 1°02′ | IR11W | | | | | | | • | | • | ○ | | | | | | | | | | | ○ | | • | • | ○ | |
| G1-1/2 | 11 | 2.31 | 46.32 | 0°55′ | IR11W | | | | | | | • | | • | • | ○ | | | | | | | | | | ○ | | • | • | • | ○ |
| G1-3/4 | 11 | 2.31 | 52.27 | 0°48′ | IR11W | | | | | | | • | | • | • | • | ○ | | | | | | | | | ○ | | • | • | • | ○ |
| G2 | 11 | 2.31 | 58.14 | 0°43′ | IR11W | | | | | | | • | | • | • | • | ○ | | | | | | | | | ○ | | • | • | • | ○ |
| G2-1/4 | 11 | 2.31 | 64.23 | 0°39′ | IR11W | | | | | | | • | | • | • | • | • | ○ | | | | | | | | ○ | | • | • | • | ○ |
| G2-1/2 | 11 | 2.31 | 73.71 | 0°34′ | IR11W | | | | | | | • | | • | • | • | • | ○ | | | | | | | | ○ | | • | • | • | ○ |
| G2-3/4 | 11 | 2.31 | 80.06 | 0°32′ | IR11W | | | | | | | • | | • | • | • | • | ○ | | | | | | | | ○ | | • | • | • | ○ |
| G3 | 11 | 2.31 | 86.41 | 0°29′ | IR11W | | | | | | | | | 0 | 0 | 0 | 0 | 0 | | | | | | | | | | | 0 | 0 | 0 |
| G3-1/2 | 11 | 2.31 | 98.85 | 0°26′ | IR11W | | | | | | | | | 0 | 0 | 0 | 0 | 0 | | | | | | | | | | | 0 | 0 | 0 |
| G4 | 11 | 2.31 | 111.55 | 0°23′ | IR11W | | | | | | | | | 0 | 0 | 0 | 0 | 0 | | | | | | | | | | | 0 | 0 | 0 |
| G4-1/2 | 11 | 2.31 | 124.25 | 0°20′ | IR11W | | | | | | | | | 0 | 0 | 0 | 0 | 0 | | | | | | | | | | | 0 | 0 | 0 |
| G5 | 11 | 2.31 | 136.95 | 0°18′ | IR11W | | | | | | | | | 0 | 0 | 0 | 0 | 0 | | | | | | | | | | | 0 | 0 | 0 |
| G6 | 11 | 2.31 | 162.35 | 0°16′ | IR11W | | | | | | | | | 0 | 0 | 0 | 0 | 0 | | | | | | | | | | | 0 | 0 | 0 |

0 : Change the shim to AN16-0 ←

0 : Change the shim to AN16-0DT ←

## Taper pipe thread (PT) This table is also applied to Rc type pipe thread.

| Nominal size | TPI | Pitch | Pitch diameter | Lead angle | Shank material | Steel shank | | | | | | | | | | | | | Carbide shank | | | | | | | | | "Tsuppari-Ichiban" | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Insert size | 6IR | | | | 11IR | | | | 16IR | | | | | 6IR | | | | 11IR | | | | 16IR | | 16IR | | | |
| | | | | | Holder Cat. No. / Insert Cat. No. | SNR0006H06-2 | SNR0006H06-3 | SNR0008H06-2 | SNR0008H06-3 | SNR0010K11 | SNR0010K11-2 | SNR0013L11 | SNR0013L11-2 | SNR0016M16 | SNR0016M16-2 | CNR0020P16 | CNR0025R16 | CNR0032S16 | (CNR0040T16) | (CNR0050U16) | SNR0006K06SC-2 | SNR0006K06SC-3 | SNR0008K06SC-2 | SNR0008K06SC-3 | SNR0010M11SC | SNR0010M11SC-2 | SNR0012P11SC | SNR0012P11SC-2 | SNR0016R16SC | SNR0016R16SC-2 | TSNR0016Q16 | TCNR0020R16DT | TCNR0025S16DT | (TCNR0032T16DT) |
| PT1/4 | 19 | 1.34 | 12.30 | 1°59′ | IR19PT | ○ | | | | | | | | | | | | | ○ | | | | | | | | | | | | |
| PT3/8 | 19 | 1.34 | 15.81 | 1°33′ | IR19PT | • | | ○ | | | | | | | | | | | • | | ○ | | | | | | | | | | |
| PT1/2 | 14 | 1.81 | 19.79 | 1°40′ | IR14PT | | | | | | ○ | | | | | | | | | | | | | • | | ○ | | | | | |
| PT3/4 | 14 | 1.81 | 25.28 | 1°19′ | IR14PT | | | | | | | | | ○ | | | | | | | | | • | | • | | ○ | | ○ | | | |
| PT1 | 11 | 2.31 | 31.77 | 1°20′ | IR11PT | | | | | | | | | • | | ○ | | | | | | | | | | | ○ | | • | ○ | | |
| PT1 1/4 | 11 | 2.31 | 40.43 | 1°02′ | IR11PT | | | | | | | | | • | | • | ○ | | | | | | | | | | ○ | | • | • | ○ | |
| PT1 1/2 | 11 | 2.31 | 46.32 | 0°55′ | IR11PT | | | | | | | | | • | | • | • | ○ | | | | | | | | | ○ | | • | • | • | ○ |
| PT2 | 11 | 2.31 | 58.14 | 0°43′ | IR11PT | | | | | | | | | • | | • | • | • | ○ | | | | | | | | ○ | | • | • | • | ○ |
| PT2 1/2 | 11 | 2.31 | 73.71 | 0°34′ | IR11PT | | | | | | | | | • | | • | • | • | • | ○ | | | | | | | ○ | | • | • | • | ○ |
| PT3 | 11 | 2.31 | 86.41 | 0°29′ | IR11PT | | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | | | | | | | | | 0 | 0 | 0 |
| PT3 1/2 | 11 | 2.31 | 98.85 | 0°26′ | IR11PT | | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | | | | | | | | | 0 | 0 | 0 |
| PT4 | 11 | 2.31 | 111.55 | 0°23′ | IR11PT | | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | | | | | | | | | 0 | 0 | 0 |
| PT5 | 11 | 2.31 | 136.95 | 0°18′ | IR11PT | | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | | | | | | | | | 0 | 0 | 0 |
| PT6 | 11 | 2.31 | 162.35 | 0°16′ | IR11PT | | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | | | | | | | | | 0 | 0 | 0 |
| PT7 | 11 | 2.31 | 187.75 | 0°13′ | IR11PT | | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | | | | | | | | | 0 | 0 | 0 |
| PT8 | 11 | 2.31 | 213.15 | 0°12′ | IR11PT | | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | | | | | | | | | 0 | 0 | 0 |
| PT9 | 11 | 2.31 | 238.55 | 0°11′ | IR11PT | | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | | | | | | | | | 0 | 0 | 0 |
| PT10 | 11 | 2.31 | 263.95 | 0°10′ | IR11PT | | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | | | | | | | | | 0 | 0 | 0 |
| PT12 | 11 | 2.31 | 314.75 | 0°08′ | IR11PT | | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | | | | | | | | | 0 | 0 | 0 |

0 : Change the shim to AN16-0 ←

0 : Change the shim to AN16-0DT ←

Note : The above tables show correspondence of internal toolholders at the time of setting clearance between thread and toolholder to 3 mm (1 mm in case of SN type) and the finishing stock to 0.1 mm.

# National taper pipe thread (NPT)

| Nominal size | TPI | Pitch | Lead angle | Shank material | Steel shank | | | | | | | | | | | Carbide shank | | | | | | | "Tsuppari-Ichiban" | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Insert size | 6IR | | | | 16IR | | | | | | | 6IR | | | | 16IR | | | 16IR | | | |
| | | | | Holder Cat. No. / Insert Cat. No. | SNR0006H06-2 | SNR0006H06-3 | SNR0008H06-2 | SNR0008H06-3 | SNR0016M16 | SNR0016M16-2 | SNR0016M16-3 | CNR0020P16 | CNR0025R16 | CNR0032S16 | (CNR0040T16) | (CNR0050U16) | SNR0006K06SC-2 | SNR0006K06SC-3 | SNR0008K06SC-2 | SNR0008K06SC-3 | SNR0016R16SC | SNR0016R16SC-2 | (SNR0016R16SC-3) | TSNR0016Q16 | TCNR0020R16DT | TCNR0025S16DT | (TCNR0032T16DT) |
| 3/8NPT | 18 | 1.41 | 1°37′ | IR18NPT | • | | ○ | | | | | | | | | | • | | ○ | | | | | | | | |
| 1/2NPT | 14 | 1.81 | 1°40′ | IR14NPT | | | | | | | | | | | | | | | | | | | | | | | |
| 3/4NPT | 14 | 1.81 | 1°19′ | IR14NPT | | | | | ○ | | | | | | | | | | | | ○ | | | ○ | | | |
| 1NPT | 11.5 | 2.21 | 1°17′ | IR115NPT | | | | | ○ | | | ○ | | | | | | | | | ○ | | | • | ○ | | |
| 1 1/4NPT | 11.5 | 2.21 | 1°00′ | IR115NPT | | | | | ○ | | | • | • | ○ | | | | | | | ○ | | | • | • | • | ○ |
| 1 1/2NPT | 11.5 | 2.21 | 0°52′ | IR115NPT | | | | | ○ | | | • | • | ○ | | | | | | | ○ | | | • | • | • | ○ |
| 2NPT | 11.5 | 2.21 | 0°41′ | IR115NPT | | | | | ○ | | | • | • | • | • | ○ | | | | | ○ | | | • | • | • | ○ |
| 2 1/2NPT | 8 | 3.175 | 0°50′ | IR8NPT | | | | | ○ | | | • | • | • | • | ○ | | | | | ○ | | | • | • | • | ○ |
| 3NPT | 8 | 3.175 | 0°40′ | IR8NPT | | | | | ○ | | | • | • | • | • | ○ | | | | | ○ | | | • | • | • | ○ |
| 3 1/2NPT | 8 | 3.175 | 0°35′ | IR8NPT | | | | | ○ | | | • | • | • | • | ○ | | | | | ○ | | | • | • | • | ○ |
| 4NPT | 8 | 3.175 | 0°31′ | IR8NPT | | | | | ○ | | | • | • | • | • | ○ | | | | | ○ | | | • | • | • | ○ |
| 5NPT | 8 | 3.175 | 0°25′ | IR8NPT | | | | | | | | 0 | 0 | 0 | 0 | 0 | | | | | | | | | 0 | 0 | 0 |
| 6NPT | 8 | 3.175 | 0°21′ | IR8NPT | | | | | | | | 0 | 0 | 0 | 0 | 0 | | | | | | | | | 0 | 0 | 0 |
| 8NPT | 8 | 3.175 | 0°16′ | IR8NPT | | | | | | | | 0 | 0 | 0 | 0 | 0 | | | | | | | | | 0 | 0 | 0 |
| 10NPT | 8 | 3.175 | 0°13′ | IR8NPT | | | | | | | | 0 | 0 | 0 | 0 | 0 | | | | | | | | | 0 | 0 | 0 |
| 12NPT | 8 | 3.175 | 0°11′ | IR8NPT | | | | | | | | 0 | 0 | 0 | 0 | 0 | | | | | | | | | 0 | 0 | 0 |
| 14NPT | 8 | 3.175 | 0°10′ | IR8NPT | | | | | | | | 0 | 0 | 0 | 0 | 0 | | | | | | | | | 0 | 0 | 0 |
| 16NPT | 8 | 3.175 | 0°09′ | IR8NPT | | | | | | | | 0 | 0 | 0 | 0 | 0 | | | | | | | | | 0 | 0 | 0 |
| 18NPT | 8 | 3.175 | 0°08′ | IR8NPT | | | | | | | | 0 | 0 | 0 | 0 | 0 | | | | | | | | | 0 | 0 | 0 |
| 20NPT | 8 | 3.175 | 0°07′ | IR8NPT | | | | | | | | 0 | 0 | 0 | 0 | 0 | | | | | | | | | 0 | 0 | 0 |
| 24NPT | 8 | 3.175 | 0°06′ | IR8NPT | | | | | | | | 0 | 0 | 0 | 0 | 0 | | | | | | | | | 0 | 0 | 0 |

0 : Change the shim to AN16-0 ←

0 : Change the shim to AN16-0DT ←

# 29° trapezoidal thread (ACME)

| Nominal size | TPI | Pitch | Pitch diameter | Lead angle | Shank material | Steel shank | | | | | | | | | | | | Carbide shank | | | "Tsuppari-Ichiban" | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Insert size | 16IR | | | | | | 22IR | | | | | 27IR | | 16IR | | | 16IR | | 22IR | |
| | | | | | Holder Cat. No. / Insert Cat. No. | SNR0016M16 | SNR0016M16-2 | SNR0016M16-3 | CNR0020P16 | CNR0025R16 | CNR0032S16 | SNR0020Q22 | SNR0020Q22-2 | SNR0020Q22-3 | CNR0025R22 | CNR0032S22 | CNR0040T27 | (CNR0050U27) | SNR0016R16SC | SNR0016R16SC-2 | SNR0016R16SC-3 | TSNR0016Q16 | TCNR0020R16DT | TCNR0025S22DT | (TCNR0032T22DT) |
| 3/8 | 12 | 2.12 | 8.465 | 4°33′ | IR12ACME | | | | | | | | | | | | | | | | | | | |
| 7/16 | 12 | 2.12 | 10.053 | 3°50′ | IR12ACME | | | | | | | | | | | | | | | | | | | |
| 1/2 | 10 | 2.54 | 11.43 | 4°03′ | IR10ACME | | | | | | | | | | | | | | | | | | | |
| 5/8 | 8 | 3.18 | 14.274 | 4°03′ | IR8ACME | | | | | | | | | | | | | | | | | | | |
| 3/4 | 6 | 4.23 | 16.934 | 4°33′ | IR6ACME | | | | | | | | | | | | | | | | | | | |
| 7/8 | 6 | 4.23 | 20.109 | 3°50′ | IR6ACME | | | | | | | | | | | | | | | | | | | |
| 1 | 5 | 5.08 | 22.86 | 4°03′ | IR5ACME | | | | | | | | | | | | | | | | | | | |
| 1-1/8 | 5 | 5.08 | 26.035 | 3°33′ | IR5ACME | | | | | | | | | | | | | | | | | | | |
| 1-1/4 | 5 | 5.08 | 29.21 | 3°10′ | IR5ACME | | | | | | | | | | | | | | | | | | | |
| 1-3/8 | 4 | 6.35 | 31.75 | 3°39′ | IR4ACME | | | | | | | | | | | | | | | | | | | |
| 1-1/2 | 4 | 6.35 | 34.925 | 3°19′ | IR4ACME | | | | | | | | | | | | | | | | | | | |
| 1-3/4 | 4 | 6.35 | 41.275 | 2°48′ | IR4ACME | | | | | | | | | | | | | | | | | | | |
| 2 | 4 | 6.35 | 47.625 | 2°26′ | IR4ACME | | | | | | | | | | | | | | | | | | | |

Because this thread standard is characterized with large pitch and small diameter, (that is a large lead angle) the standard inserts and toolholders can not be used for machining this thread type. The application is limited to outside of the standard.

Note : The above tables show correspondence of internal toolholders at the time of setting clearance between thread and toolholder to 3 mm (1 mm in case of SN type) and the finishing stock to 0.1 mm.

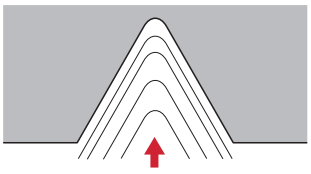
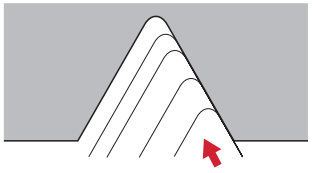
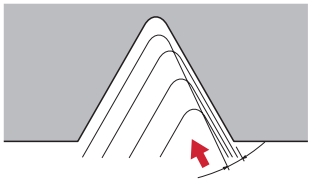
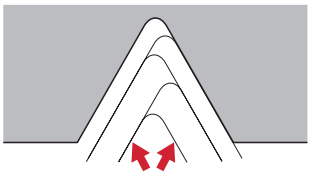
## Threading guidelines

Determine the infeed per pass and number of threads whilst referring to the table and description below.

| Pitch | 0.5 | 0.75 | 1 | 1.25 | 1.5 | 1.75 | 2 | 2.5 | 3 | 3.5 | 4 | 4.5 | 5 ~ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TPI | 48 | 32 | 24 | 20 | 16 | 14 | 12 | 10 | 8 | 7 | 6 | 5.5 | 5 ~ |
| No. of passes | 4 ~ 6 | 4 ~ 7 | 4 ~ 8 | 5 ~ 9 | 6 ~ 10 | 7 ~ 12 | 7 ~ 12 | 8 ~ 14 | 10 ~ 16 | 11 ~ 18 | 11 ~ 18 | 11 ~ 19 | 12 ~ 24 |

Note:
- When using the full-profile insert, set the total infeed amount by taking the finish stock of 0.1mm into account.
- Set the first infeed to 150 ~ 200% of nose R and do not allow it to exceed 0.5 mm.
- The infeed amount during the final pass must be a minimum of 0.05 mm. No zero cuts should be made. (Extra small infeed or zero cutting of work hardened surfaces will reduce tool life.)
- The partial-profile insert or inside diameter insert has small nose R. Reduce the infeed per pass and increase the no. of passes.
- Regarding standard infeed per passes and no. of passes, please refer to our catalogue.

## Infeed methods for threading tools

| Infeed method | Features |
|---|---|
|  Straight infeed (radial infeed) | • Most simple and usual method<br>Suitable for relatively small pitch threads of easily machinable material.<br>• Chip contact length on right and left is longer, causing chattering, with increased load on the nose end.<br>• When the half included angle is not symmetrical to the right and left, infeeding in the direction of 1/2 of the included angle will ensure equal machining with right and left cutting edges. |
|  Single edge infeed (flank infeed) | • Suitable for large pitch threads or easy to tear materials. Effectively prevents chattering.<br>• Chips are discharged in one direction only. Satisfactory chip control.<br>• Edge on the right (with zero infeed) tends to be worn heavily. |
|  Modified single-edge infeed (flank infeed) | • Suitable for large pitch threads or easy to tear materials. Effectively prevents chattering.<br>• Chips are discharged in one direction only. Satisfactory chip control.<br>• Edge on the right performs some cutting, therefore wear of this edge can thus be suppressed. |
|  Alternating flank infeed | • Suitable for large pitch threads or easy to tear material. Effectively prevents chattering.<br>• Chips are discharged alternately in right and left directions, resulting possibly in entanglement.<br>• Right and left edges are used alternately, ensuring uniform wear and extending tool life. |

## ISO metric full-profile inserts (for external)

| Pitch | | 0.5 | 0.75 | 1 | 1.25 | 1.5 | 1.75 | 2 | 2.5 | 3 | 3.5 | 4 | 4.5 | 5 | 5.5 | 6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Height of thread | | 0.32 | 0.47 | 0.63 | 0.79 | 0.95 | 1.11 | 1.27 | 1.58 | 1.9 | 2.21 | 2.53 | 2.85 | 3.16 | 3.48 | 3.8 |
| Total depth of cut | | 0.42 | 0.57 | 0.73 | 0.89 | 1.05 | 1.21 | 1.37 | 1.68 | 2 | 2.31 | 2.63 | 2.95 | 3.26 | 3.58 | 3.9 |
| Number of passes | 1 | 0.15 | 0.18 | 0.25 | 0.25 | 0.3 | 0.3 | 0.3 | 0.3 | 0.35 | 0.35 | 0.4 | 0.4 | 0.45 | 0.5 | 0.5 |
| | 2 | 0.12 | 0.12 | 0.2 | 0.2 | 0.25 | 0.25 | 0.25 | 0.25 | 0.3 | 0.3 | 0.35 | 0.35 | 0.35 | 0.35 | 0.4 |
| | 3 | 0.1 | 0.12 | 0.13 | 0.15 | 0.2 | 0.2 | 0.2 | 0.25 | 0.25 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 |
| | 4 | 0.05 | 0.1 | 0.1 | 0.14 | 0.15 | 0.16 | 0.2 | 0.23 | 0.2 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 |
| | 5 | | 0.05 | 0.05 | 0.1 | 0.1 | 0.15 | 0.15 | 0.2 | 0.2 | 0.21 | 0.2 | 0.2 | 0.25 | 0.23 | 0.25 |
| | 6 | | | | 0.05 | 0.05 | 0.1 | 0.12 | 0.15 | 0.15 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| | 7 | | | | | | 0.05 | 0.1 | 0.15 | 0.15 | 0.15 | 0.15 | 0.2 | 0.2 | 0.2 | 0.2 |
| | 8 | | | | | | | 0.05 | 0.1 | 0.15 | 0.15 | 0.15 | 0.15 | 0.18 | 0.15 | 0.15 |
| | 9 | | | | | | | | 0.05 | 0.1 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 |
| | 10 | | | | | | | | | 0.1 | 0.1 | 0.13 | 0.15 | 0.15 | 0.15 | 0.15 |
| | 11 | | | | | | | | | 0.05 | 0.1 | 0.1 | 0.15 | 0.13 | 0.15 | 0.15 |
| | 12 | | | | | | | | | | 0.05 | 0.1 | 0.1 | 0.1 | 0.15 | 0.15 |
| | 13 | | | | | | | | | | | 0.1 | 0.1 | 0.1 | 0.15 | 0.15 |
| | 14 | | | | | | | | | | | 0.05 | 0.1 | 0.1 | 0.1 | 0.15 |
| | 15 | | | | | | | | | | | | 0.1 | 0.1 | 0.1 | 0.1 |
| | 16 | | | | | | | | | | | | 0.05 | 0.1 | 0.1 | 0.1 |
| | 17 | | | | | | | | | | | | | 0.1 | 0.1 | 0.1 |
| | 18 | | | | | | | | | | | | | 0.05 | 0.1 | 0.1 |
| | 19 | | | | | | | | | | | | | | 0.1 | 0.1 |
| | 20 | | | | | | | | | | | | | | 0.05 | 0.1 |
| | 21 | | | | | | | | | | | | | | | 0.1 |
| | 22 | | | | | | | | | | | | | | | 0.05 |
| | 23 | | | | | | | | | | | | | | | |
| | 24 | | | | | | | | | | | | | | | |

## ISO metric full-profile inserts (for internal)

| Pitch | | 0.5 | 0.75 | 1 | 1.25 | 1.5 | 1.75 | 2 | 2.5 | 3 | 3.5 | 4 | 4.5 | 5 | 5.5 | 6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Height of thread | | 0.29 | 0.43 | 0.58 | 0.72 | 0.87 | 1.01 | 1.16 | 1.45 | 1.74 | 2.03 | 2.32 | 2.61 | 2.9 | 3.19 | 3.48 |
| Total depth of cut | | 0.39 | 0.53 | 0.68 | 0.82 | 0.97 | 1.11 | 1.26 | 1.55 | 1.84 | 2.13 | 2.42 | 2.71 | 3 | 3.29 | 3.58 |
| Number of passes | 1 | 0.08 | 0.1 | 0.14 | 0.15 | 0.2 | 0.2 | 0.2 | 0.25 | 0.25 | 0.3 | 0.3 | 0.35 | 0.35 | 0.4 | 0.4 |
| | 2 | 0.07 | 0.09 | 0.13 | 0.13 | 0.16 | 0.18 | 0.18 | 0.22 | 0.22 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 |
| | 3 | 0.07 | 0.08 | 0.11 | 0.12 | 0.14 | 0.16 | 0.17 | 0.2 | 0.2 | 0.22 | 0.22 | 0.22 | 0.22 | 0.22 | 0.22 |
| | 4 | 0.06 | 0.08 | 0.1 | 0.11 | 0.12 | 0.14 | 0.16 | 0.18 | 0.18 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| | 5 | 0.06 | 0.07 | 0.08 | 0.1 | 0.12 | 0.12 | 0.14 | 0.16 | 0.16 | 0.18 | 0.18 | 0.18 | 0.2 | 0.2 | 0.19 |
| | 6 | 0.05 | 0.06 | 0.07 | 0.09 | 0.1 | 0.1 | 0.12 | 0.15 | 0.15 | 0.16 | 0.18 | 0.18 | 0.18 | 0.18 | 0.18 |
| | 7 | | 0.05 | 0.05 | 0.07 | 0.08 | 0.09 | 0.1 | 0.1 | 0.14 | 0.14 | 0.16 | 0.16 | 0.16 | 0.16 | 0.17 |
| | 8 | | | | 0.05 | 0.05 | 0.07 | 0.08 | 0.1 | 0.13 | 0.13 | 0.14 | 0.14 | 0.14 | 0.14 | 0.16 |
| | 9 | | | | | | 0.05 | 0.06 | 0.08 | 0.12 | 0.12 | 0.14 | 0.14 | 0.14 | 0.14 | 0.15 |
| | 10 | | | | | | | 0.05 | 0.06 | 0.1 | 0.11 | 0.12 | 0.12 | 0.13 | 0.13 | 0.14 |
| | 11 | | | | | | | | 0.05 | 0.08 | 0.1 | 0.12 | 0.12 | 0.13 | 0.13 | 0.14 |
| | 12 | | | | | | | | | 0.06 | 0.1 | 0.1 | 0.12 | 0.12 | 0.13 | 0.13 |
| | 13 | | | | | | | | | 0.05 | 0.07 | 0.1 | 0.11 | 0.12 | 0.12 | 0.13 |
| | 14 | | | | | | | | | | 0.05 | 0.09 | 0.1 | 0.12 | 0.12 | 0.13 |
| | 15 | | | | | | | | | | | 0.07 | 0.1 | 0.11 | 0.12 | 0.12 |
| | 16 | | | | | | | | | | | 0.05 | 0.09 | 0.1 | 0.12 | 0.12 |
| | 17 | | | | | | | | | | | | 0.08 | 0.1 | 0.1 | 0.12 |
| | 18 | | | | | | | | | | | | 0.05 | 0.1 | 0.1 | 0.1 |
| | 19 | | | | | | | | | | | | | 0.08 | 0.1 | 0.1 |
| | 20 | | | | | | | | | | | | | 0.05 | 0.1 | 0.1 |
| | 21 | | | | | | | | | | | | | | 0.08 | 0.1 |
| | 22 | | | | | | | | | | | | | | 0.05 | 0.1 |
| | 23 | | | | | | | | | | | | | | | 0.08 |
| | 24 | | | | | | | | | | | | | | | 0.05 |

## Unified full-profile inserts

| | | For external | | | | | | | For internal | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TPI | | 24 | 20 | 18 | 16 | 14 | 12 | 8 | 24 | 20 | 18 | 16 | 14 | 12 | 8 |
| Height of thread | | 0.67 | 0.8 | 0.89 | 1.01 | 1.15 | 1.34 | 2.01 | 0.61 | 0.74 | 0.82 | 0.92 | 1.05 | 1.23 | 1.84 |
| Total depth of cut | | 0.77 | 0.9 | 0.99 | 1.11 | 1.25 | 1.44 | 2.11 | 0.71 | 0.84 | 0.92 | 1.02 | 1.15 | 1.33 | 1.94 |
| Number of passes | 1 | 0.25 | 0.25 | 0.28 | 0.3 | 0.3 | 0.3 | 0.35 | 0.2 | 0.2 | 0.2 | 0.2 | 0.25 | 0.25 | 0.3 |
| | 2 | 0.22 | 0.2 | 0.23 | 0.25 | 0.25 | 0.25 | 0.3 | 0.16 | 0.16 | 0.18 | 0.18 | 0.2 | 0.2 | 0.25 |
| | 3 | 0.15 | 0.16 | 0.18 | 0.18 | 0.23 | 0.21 | 0.25 | 0.12 | 0.13 | 0.15 | 0.16 | 0.18 | 0.18 | 0.22 |
| | 4 | 0.1 | 0.14 | 0.15 | 0.15 | 0.18 | 0.18 | 0.22 | 0.1 | 0.12 | 0.14 | 0.14 | 0.16 | 0.16 | 0.2 |
| | 5 | 0.05 | 0.1 | 0.1 | 0.1 | 0.14 | 0.15 | 0.2 | 0.08 | 0.1 | 0.1 | 0.11 | 0.13 | 0.13 | 0.18 |
| | 6 | | 0.05 | 0.05 | 0.08 | 0.1 | 0.12 | 0.2 | 0.05 | 0.08 | 0.1 | 0.1 | 0.1 | 0.1 | 0.16 |
| | 7 | | | | 0.05 | 0.05 | 0.1 | 0.16 | | 0.05 | 0.05 | 0.08 | 0.08 | 0.1 | 0.14 |
| | 8 | | | | | | 0.08 | 0.16 | | | | 0.05 | 0.05 | 0.08 | 0.12 |
| | 9 | | | | | | 0.05 | 0.12 | | | | | | 0.08 | 0.12 |
| | 10 | | | | | | | 0.1 | | | | | | 0.05 | 0.1 |
| | 11 | | | | | | | 0.05 | | | | | | | 0.1 |
| | 12 | | | | | | | | | | | | | | 0.05 |
| | 13 | | | | | | | | | | | | | | |
| | 14 | | | | | | | | | | | | | | |

## Whitworth full-profile inserts

| | | For external | | | | | | | | | For internal | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TPI | | 20 | 19 | 18 | 16 | 14 | 12 | 11 | 10 | 8 | 20 | 19 | 18 | 16 | 14 | 12 | 11 | 10 | 8 |
| Height of thread | | 0.83 | 0.88 | 0.92 | 1.04 | 1.19 | 1.39 | 1.51 | 1.66 | 2.08 | 0.83 | 0.88 | 0.92 | 1.04 | 1.19 | 1.39 | 1.51 | 1.66 | 2.08 |
| Total depth of cut | | 0.93 | 0.98 | 1.02 | 1.14 | 1.29 | 1.49 | 1.61 | 1.76 | 2.18 | 0.93 | 0.98 | 1.02 | 1.14 | 1.29 | 1.49 | 1.61 | 1.76 | 2.18 |
| Number of passes | 1 | 0.25 | 0.28 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.35 | 0.35 | 0.2 | 0.2 | 0.22 | 0.22 | 0.25 | 0.25 | 0.25 | 0.3 | 0.35 |
| | 2 | 0.2 | 0.22 | 0.24 | 0.25 | 0.25 | 0.25 | 0.25 | 0.3 | 0.3 | 0.18 | 0.18 | 0.18 | 0.18 | 0.21 | 0.21 | 0.21 | 0.25 | 0.3 |
| | 3 | 0.18 | 0.18 | 0.18 | 0.18 | 0.23 | 0.2 | 0.2 | 0.23 | 0.25 | 0.16 | 0.16 | 0.17 | 0.17 | 0.2 | 0.2 | 0.2 | 0.22 | 0.25 |
| | 4 | 0.15 | 0.15 | 0.15 | 0.14 | 0.2 | 0.18 | 0.18 | 0.2 | 0.23 | 0.14 | 0.16 | 0.16 | 0.16 | 0.18 | 0.18 | 0.18 | 0.2 | 0.22 |
| | 5 | 0.1 | 0.1 | 0.1 | 0.12 | 0.16 | 0.15 | 0.15 | 0.15 | 0.22 | 0.12 | 0.13 | 0.14 | 0.14 | 0.16 | 0.16 | 0.16 | 0.16 | 0.2 |
| | 6 | 0.05 | 0.05 | 0.05 | 0.1 | 0.1 | 0.14 | 0.14 | 0.14 | 0.2 | 0.08 | 0.1 | 0.1 | 0.12 | 0.14 | 0.14 | 0.14 | 0.14 | 0.18 |
| | 7 | | | | 0.05 | 0.05 | 0.12 | 0.12 | 0.12 | 0.18 | 0.05 | 0.05 | 0.05 | 0.1 | 0.1 | 0.1 | 0.12 | 0.12 | 0.16 |
| | 8 | | | | | | 0.1 | 0.12 | 0.12 | 0.16 | | | | 0.05 | 0.05 | 0.1 | 0.1 | 0.12 | 0.14 |
| | 9 | | | | | | 0.05 | 0.1 | 0.1 | 0.14 | | | | | | 0.1 | 0.1 | 0.1 | 0.12 |
| | 10 | | | | | | | 0.05 | 0.05 | 0.1 | | | | | | 0.05 | 0.1 | 0.1 | 0.11 |
| | 11 | | | | | | | | | 0.05 | | | | | | | 0.05 | 0.05 | 0.1 |
| | 12 | | | | | | | | | | | | | | | | | | 0.05 |
| | 13 | | | | | | | | | | | | | | | | | | |
| | 14 | | | | | | | | | | | | | | | | | | |
| | 15 | | | | | | | | | | | | | | | | | | |

## 30° Trapezoidal (TR) inserts

| | | For external | | | | | For internal | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Pitch | | 2 | 3 | 4 | 5 | 6 | 2 | 3 | 4 | 5 | 6 |
| Height of thread | | 1.25 | 1.75 | 2.25 | 2.75 | 3.5 | 1.25 | 1.75 | 2.25 | 2.75 | 3.5 |
| Total depth of cut | | 1.35 | 1.85 | 2.35 | 2.85 | 3.6 | 1.35 | 1.85 | 2.35 | 2.85 | 3.6 |
| Number of passes | 1 | 0.25 | 0.25 | 0.3 | 0.3 | 0.3 | 0.2 | 0.22 | 0.25 | 0.25 | 0.25 |
| | 2 | 0.2 | 0.22 | 0.25 | 0.25 | 0.25 | 0.18 | 0.2 | 0.22 | 0.22 | 0.22 |
| | 3 | 0.2 | 0.2 | 0.22 | 0.2 | 0.23 | 0.18 | 0.18 | 0.2 | 0.2 | 0.21 |
| | 4 | 0.18 | 0.18 | 0.2 | 0.2 | 0.2 | 0.16 | 0.16 | 0.2 | 0.18 | 0.2 |
| | 5 | 0.15 | 0.17 | 0.18 | 0.18 | 0.18 | 0.15 | 0.16 | 0.17 | 0.18 | 0.18 |
| | 6 | 0.12 | 0.16 | 0.16 | 0.16 | 0.18 | 0.13 | 0.16 | 0.16 | 0.16 | 0.18 |
| | 7 | 0.1 | 0.14 | 0.15 | 0.16 | 0.16 | 0.1 | 0.14 | 0.16 | 0.16 | 0.16 |
| | 8 | 0.1 | 0.14 | 0.14 | 0.15 | 0.16 | 0.1 | 0.14 | 0.14 | 0.15 | 0.16 |
| | 9 | 0.05 | 0.12 | 0.14 | 0.14 | 0.16 | 0.1 | 0.12 | 0.14 | 0.14 | 0.16 |
| | 10 | | 0.12 | 0.12 | 0.14 | 0.16 | 0.05 | 0.12 | 0.12 | 0.14 | 0.16 |
| | 11 | | 0.1 | 0.12 | 0.14 | 0.16 | | 0.1 | 0.12 | 0.14 | 0.16 |
| | 12 | | 0.05 | 0.12 | 0.12 | 0.15 | | 0.1 | 0.12 | 0.12 | 0.15 |
| | 13 | | | 0.1 | 0.12 | 0.15 | | 0.05 | 0.1 | 0.12 | 0.15 |
| | 14 | | | 0.1 | 0.12 | 0.15 | | | 0.1 | 0.12 | 0.15 |
| | 15 | | | 0.05 | 0.12 | 0.14 | | | 0.1 | 0.12 | 0.14 |
| | 16 | | | | 0.1 | 0.14 | | | 0.05 | 0.1 | 0.14 |
| | 17 | | | | 0.1 | 0.12 | | | | 0.1 | 0.12 |
| | 18 | | | | 0.1 | 0.12 | | | | 0.1 | 0.12 |
| | 19 | | | | 0.05 | 0.12 | | | | 0.1 | 0.12 |
| | 20 | | | | | 0.12 | | | | 0.05 | 0.12 |
| | 21 | | | | | 0.1 | | | | | 0.1 |
| | 22 | | | | | 0.1 | | | | | 0.1 |
| | 23 | | | | | 0.05 | | | | | 0.1 |
| | 24 | | | | | | | | | | 0.05 |
| | 25 | | | | | | | | | | |
| | 26 | | | | | | | | | | |

## 29° Trapezoidal (TR) inserts

| | | For external | | | For internal | | |
|---|---|---|---|---|---|---|---|
| TPI | | 8 | 6 | 5 | 8 | 6 | 5 |
| Height of thread | | 1.88 | 2.41 | 2.92 | 1.88 | 2.41 | 2.92 |
| Total depth of cut | | 1.98 | 2.51 | 3.02 | 1.98 | 2.51 | 3.02 |
| Number of passes | 1 | 0.25 | 0.25 | 0.25 | 0.22 | 0.22 | 0.22 |
| | 2 | 0.22 | 0.22 | 0.22 | 0.2 | 0.2 | 0.2 |
| | 3 | 0.2 | 0.2 | 0.2 | 0.18 | 0.18 | 0.18 |
| | 4 | 0.18 | 0.18 | 0.18 | 0.16 | 0.18 | 0.18 |
| | 5 | 0.16 | 0.17 | 0.18 | 0.16 | 0.16 | 0.16 |
| | 6 | 0.16 | 0.16 | 0.16 | 0.16 | 0.15 | 0.16 |
| | 7 | 0.16 | 0.16 | 0.16 | 0.15 | 0.15 | 0.15 |
| | 8 | 0.14 | 0.14 | 0.14 | 0.14 | 0.14 | 0.14 |
| | 9 | 0.14 | 0.14 | 0.14 | 0.14 | 0.14 | 0.14 |
| | 10 | 0.12 | 0.14 | 0.14 | 0.12 | 0.14 | 0.14 |
| | 11 | 0.1 | 0.14 | 0.14 | 0.1 | 0.14 | 0.14 |
| | 12 | 0.1 | 0.12 | 0.14 | 0.1 | 0.12 | 0.14 |
| | 13 | 0.05 | 0.12 | 0.12 | 0.1 | 0.12 | 0.12 |
| | 14 | | 0.12 | 0.12 | 0.05 | 0.12 | 0.12 |
| | 15 | | 0.1 | 0.12 | | 0.1 | 0.12 |
| | 16 | | 0.1 | 0.12 | | 0.1 | 0.12 |
| | 17 | | 0.05 | 0.12 | | 0.1 | 0.12 |
| | 18 | | | 0.12 | | 0.05 | 0.12 |
| | 19 | | | 0.1 | | | 0.1 |
| | 20 | | | 0.1 | | | 0.1 |
| | 21 | | | 0.05 | | | 0.1 |
| | 22 | | | | | | 0.05 |
| | 23 | | | | | | |
| | 24 | | | | | | |
| | 25 | | | | | | |
| | 26 | | | | | | |

## PT full-profile inserts

| | | For external | | | | For internal | | |
|---|---|---|---|---|---|---|---|---|
| TPI | | 28 | 19 | 14 | 11 | 19 | 14 | 11 |
| Height of thread | | 0.6 | 0.86 | 1.16 | 1.48 | 0.86 | 1.16 | 1.48 |
| Total depth of cut | | 0.7 | 0.96 | 1.26 | 1.58 | 0.96 | 1.26 | 1.58 |
| Number of passes | 1 | 0.25 | 0.28 | 0.3 | 0.3 | 0.22 | 0.25 | 0.25 |
| | 2 | 0.2 | 0.2 | 0.25 | 0.25 | 0.2 | 0.22 | 0.22 |
| | 3 | 0.1 | 0.18 | 0.2 | 0.22 | 0.18 | 0.18 | 0.18 |
| | 4 | 0.1 | 0.15 | 0.15 | 0.18 | 0.16 | 0.14 | 0.18 |
| | 5 | 0.05 | 0.1 | 0.11 | 0.15 | 0.1 | 0.12 | 0.15 |
| | 6 | | 0.05 | 0.1 | 0.12 | 0.05 | 0.1 | 0.13 |
| | 7 | | | 0.1 | 0.11 | 0.05 | 0.1 | 0.12 |
| | 8 | | | 0.05 | 0.1 | | 0.1 | 0.1 |
| | 9 | | | | 0.1 | | 0.05 | 0.1 |
| | 10 | | | | 0.05 | | | 0.1 |
| | 11 | | | | | | | 0.05 |
| | 12 | | | | | | | |
| | 13 | | | | | | | |
| | 14 | | | | | | | |
| | 15 | | | | | | | |
| | 16 | | | | | | | |
| | 17 | | | | | | | |
| | 18 | | | | | | | |
| | 19 | | | | | | | |
| | 20 | | | | | | | |
| | 21 | | | | | | | |
| | 22 | | | | | | | |
| | 23 | | | | | | | |
| | 24 | | | | | | | |
| | 25 | | | | | | | |
| | 26 | | | | | | | |

## NPT full-profile inserts

| | | For external | | | | For internal | | |
|---|---|---|---|---|---|---|---|---|
| TPI | | 18 | 14 | 11.5 | 8 | 14 | 11.5 | 8 |
| Height of thread | | 1.14 | 1.47 | 1.79 | 2.58 | 1.47 | 1.79 | 2.58 |
| Total depth of cut | | 1.24 | 1.57 | 1.89 | 2.68 | 1.57 | 1.89 | 2.68 |
| Number of passes | 1 | 0.2 | 0.25 | 0.25 | 0.3 | 0.22 | 0.22 | 0.25 |
| | 2 | 0.18 | 0.22 | 0.22 | 0.25 | 0.2 | 0.2 | 0.2 |
| | 3 | 0.17 | 0.2 | 0.2 | 0.2 | 0.18 | 0.18 | 0.2 |
| | 4 | 0.16 | 0.18 | 0.18 | 0.2 | 0.18 | 0.18 | 0.2 |
| | 5 | 0.14 | 0.17 | 0.18 | 0.2 | 0.16 | 0.16 | 0.2 |
| | 6 | 0.12 | 0.16 | 0.17 | 0.2 | 0.14 | 0.16 | 0.2 |
| | 7 | 0.12 | 0.12 | 0.16 | 0.18 | 0.12 | 0.16 | 0.18 |
| | 8 | 0.1 | 0.12 | 0.14 | 0.18 | 0.12 | 0.14 | 0.18 |
| | 9 | 0.05 | 0.1 | 0.12 | 0.16 | 0.1 | 0.12 | 0.16 |
| | 10 | | 0.05 | 0.12 | 0.16 | 0.1 | 0.12 | 0.16 |
| | 11 | | | 0.1 | 0.14 | 0.05 | 0.1 | 0.14 |
| | 12 | | | 0.05 | 0.14 | | 0.1 | 0.14 |
| | 13 | | | | 0.12 | | 0.05 | 0.12 |
| | 14 | | | | 0.1 | | | 0.1 |
| | 15 | | | | 0.1 | | | 0.1 |
| | 16 | | | | 0.05 | | | 0.1 |
| | 17 | | | | | | | 0.05 |
| | 18 | | | | | | | |
| | 19 | | | | | | | |
| | 20 | | | | | | | |
| | 21 | | | | | | | |
| | 22 | | | | | | | |
| | 23 | | | | | | | |
| | 24 | | | | | | | |
| | 25 | | | | | | | |
| | 26 | | | | | | | |

## Designation System for TAC Threading Tools (TT-type)

### Insert

**TT** **R** **42** **M** **-005**

| ① Hand | |
|---|---|
| R | Right |
| L | Left |

| ② Insert size (mm) | |
|---|---|
| Inscribed circle | 12.7 |
| Thickness | 3.2 |

| ③ Thread type | |
|---|---|
| M | 60° thread angle |
| W | 55° thread angle |

| ④ Corner radius (mm) | |
|---|---|
| Blank | 0 |
| -005 | 0.05 |

### Toolholder

**TT-** **20** **20** **R** **E**

| ① Shank height (mm) |
|---|

| ② Shank width (mm) |
|---|

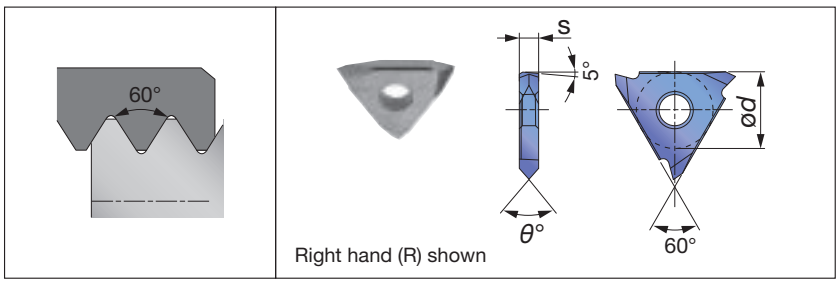
| ③ Hand | |
|---|---|
| R | Right |
| L | Left |

| ④ External or Internal | |
|---|---|
| E | External |
| I | Internal |



TT-type Insert

## 60° thread angle

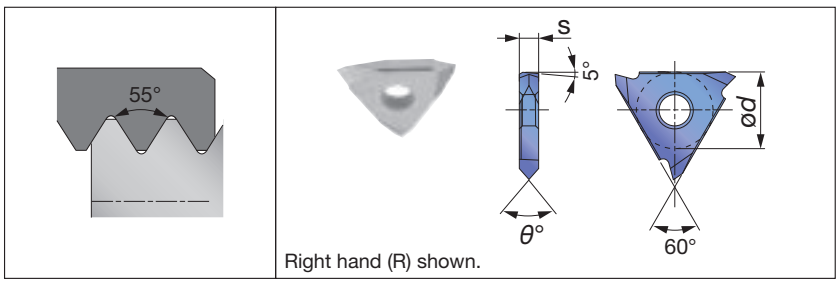



### Partial-profile insert for external and internal threads

| Pitch | TPI | Hand of cut | Designation | Grade | | ød | s | θ° | Applicable toolholders |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Cermet | Uncoated | | | | |
| | | | | NS9530 | TH10 | | | | |
| ≤ 3 | ≥ 8 | R | **TTR42M-005** | ● | ● | 12.7 | 3.2 | 60 | TT-****RE/LI |
| ≤ 3 | ≥ 8 | L | **TTL42M-005** | ● | ● | 12.7 | 3.2 | 60 | TT-****LE/RI |

TT-type Insert

## 55° thread angle



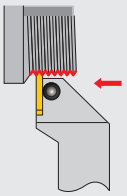

### Partial-profile insert for external and internal threads

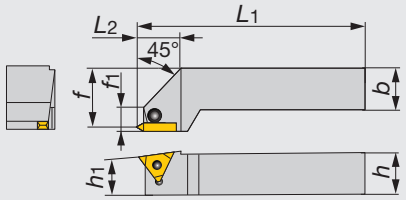
| Pitch | TPI | Hand of cut | Designation | Grade | | ød | s | θ° | Applicable toolholders |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Cermet | Uncoated | | | | |
| | | | | NS9530 | TH10 | | | | |
| ≤ 3 | ≥ 8 | R | **TTR42W-005** | ● | ● | 12.7 | 3.2 | 55 | TT-****RE/LI |
| ≤ 3 | ≥ 8 | L | **TTL42W-005** | ● | ● | 12.7 | 3.2 | 55 | TT-****LE/RI |

● : Line-up / Packing Quantity = 5 pcs.

## TT-R/LE

"TT type"External threading toolholders, pin lock






Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | f1 | Insert |
|---|---|---|---|---|---|---|---|---|
| TT-2525R/LE | 25 | 25 | 150 | 25 | 25 | 32. | 15 | TTR/L42... |

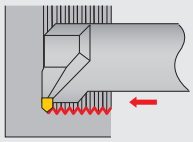
SPARE PARTS

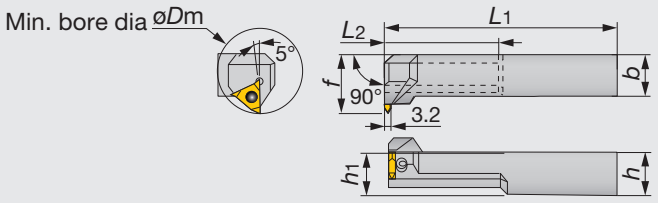
| Designation | Clamp | Right-left screw | Wrench |
|---|---|---|---|
| TT-2525R/LE | CP91 | DS-6 | P-3 |

TUNGTHREAD

## TT-R/LI

"TT type"Internal threading toolholders, pin lock






Right hand (R) shown.

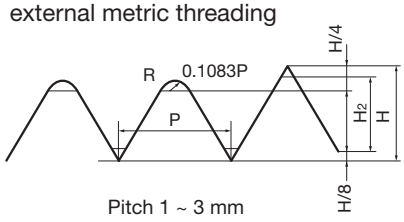
| Designation | øDm | h | b | L1 | L2 | h1 | f | Insert |
|---|---|---|---|---|---|---|---|---|
| TT-2525RI | 50 | 25 | 25 | 200 | 70 | 25 | 35 | TTL42... |

Notes : The left hand insert is used for right hand toolholders.

SPARE PARTS

| Designation | Clamp | Right-left screw | Wrench |
|---|---|---|---|
| TT-2525RI | CP91 | DS-6 | P-3 |

- Relationship between pitch, depth of cut and number of passes for external metric threading

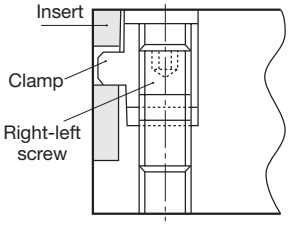



Pitch 1 ~ 3 mm

Note: Maximum machinable pitch is 3 mm.

| | P | 1 | 1.25 | 1.5 | 1.75 | 2 | 2.5 | 3 |
|---|---|---|---|---|---|---|---|---|
| | $H_2$ | 0.6 | 0.76 | 0.92 | 1.09 | 1.25 | 1.57 | 1.9 |
| | H | 0.866 | 1.083 | 1.299 | 1.516 | 1.732 | 2.165 | 2.598 |
| Number of passes | 1 | 0.25 | 0.3 | 0.3 | 0.3 | 0.35 | 0.4 | 0.4 |
| | 2 | 0.15 | 0.2 | 0.25 | 0.25 | 0.25 | 0.3 | 0.35 |
| | 3 | 0.1 | 0.1 | 0.15 | 0.2 | 0.2 | 0.25 | 0.28 |
| | 4 | 0.05 | 0.06 | 0.1 | 0.1 | 0.16 | 0.2 | 0.2 |
| | 5 | 0.05 | 0.06 | 0.05 | 0.1 | 0.1 | 0.15 | 0.2 |
| | 6 | | 0.06 | 0.05 | 0.07 | 0.07 | 0.1 | 0.13 |
| | 7 | | | 0.02 | 0.05 | 0.05 | 0.07 | 0.1 |
| | 8 | | | | 0.02 | 0.02 | 0.05 | 0.1 |
| | 9 | | | | | 0.02 | 0.03 | 0.05 |
| | 10 | | | | | | 0.02 | 0.05 |
| | 11 | | | | | | | 0.02 |
| | 12 | | | | | | | 0.02 |

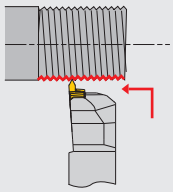
## ● Part assembly

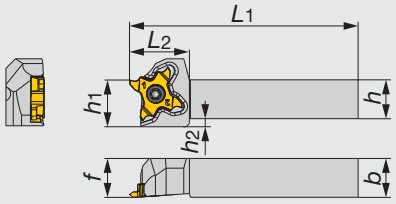



TT-R/LE, TT-R/LI: Inserts → **B419**

## STCR/L-18

Precision threading tools with uniquely shaped insert for swiss type machine, automatic and general lathes






Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *h*2 | Insert |
|---|---|---|---|---|---|---|---|---|
| STCR/L1010X18 | 10 | 10 | 120 | 18.5 | 10 | 10 | 4.5 | TC*18... |
| STCR/L1212F18 | 12 | 12 | 85 | 18.5 | 12 | 12 | 2.5 | TC*18... |
| STCR/L1212X18 | 12 | 12 | 120 | 18.5 | 12 | 12 | 2.5 | TC*18... |
| STCR/L1616X18 | 16 | 16 | 120 | 18.5 | 16 | 16 | - | TC*18... |
| STCR/L2020H18 | 20 | 20 | 100 | 18.5 | 20 | 20 | - | TC*18... |
| STCR/L2020X18 | 20 | 20 | 120 | 23 | 20 | 25 | - | TC*18... |
| STCR/L2525Z18 | 25 | 25 | 135 | 23 | 25 | 30 | - | TC*18... |

- The right hand insert (TCT18R...) is used for the right hand toolholders (STCR...), and the left hand insert (TCL18...) is used for the left hand toolholders (STCL...).

### SPARE PARTS



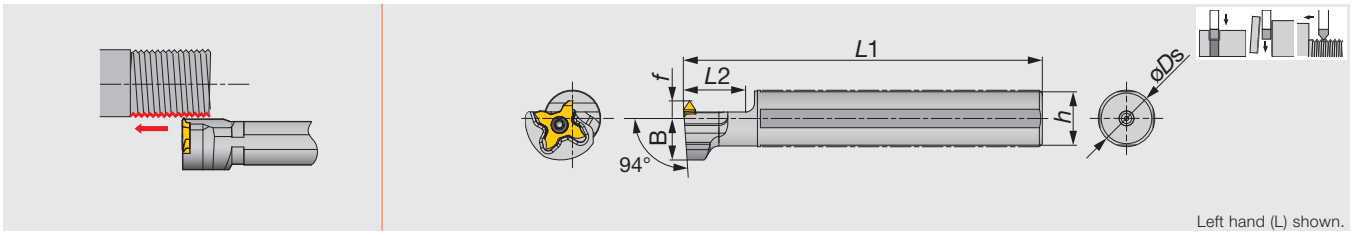

| Designation | Clamping screw | Wrench |
|---|---|---|
| STCR... | CSTC-4L100DL | T-1008/5 |
| STCL... | CSTC-4L100DR | T-1008/5 |

STCR/L-18: Inserts, Standard cutting conditions → **B423**

# JS-STCL18

Precision threading tools with uniquely shaped insert for swiss type machine,automatic and general lathes






Left hand (L) shown.

| Designation | øDs | L1 | L2 | h | B | f | Insert |
|---|---|---|---|---|---|---|---|
| JS14H-STCL18 | 14 | 100 | 20 | 13 | 14 | 6 | TC*18R... |
| JS159F-STCL18 | 15.875 | 85 | 20 | 15 | 14 | 6 | TC*18R... |
| JS16F-STCL18 | 16 | 85 | 20 | 15 | 14 | 6 | TC*18R... |
| JS19G-STCL18 | 19.05 | 90 | 20 | 18 | 14 | 6 | TC*18R... |
| JS19X-STCL18 | 19.05 | 120 | 20 | 18 | 14 | 6 | TC*18R... |
| JS20G-STCL18 | 20 | 90 | 20 | 19 | 14 | 6 | TC*18R... |
| JS20X-STCL18 | 20 | 120 | 20 | 19 | 14 | 6 | TC*18R... |
| JS22X-STCL18 | 22 | 120 | 20 | 21 | 12.25 | 10 | TC*18R... |
| JS25H-STCL18 | 25 | 100 | 20 | 24 | 12.25 | 10 | TC*18R... |
| JS254X-STCL18 | 25.4 | 120 | 20 | 24 | 12.25 | 10 | TC*18R... |

- The right hand insert (TCT18R...) is used for the left hand toolholders (STCL...)

## SPARE PARTS

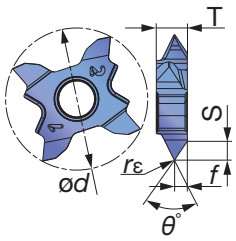



| Designation | Clamping screw | Wrench |
|---|---|---|
| JS**STCL18 | CSTC-4L100DL | T-1008/5 |

## INSERT

### TCT18R/L(For Threading)





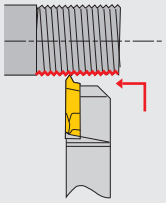

| Designation | Coating AH725 R | L | Pitch min | Pitch max | *f* | S | *rε* | *θ°* | T | *ød* |
|---|---|---|---|---|---|---|---|---|---|---|
| TCT18R/L-60N-010 | ● | ● | 0.8 | 3 | 1.6 | 2.67 | 0.1 | 60 | 4 | 18 |
| TCT18R/L-60N-020 | ● | ● | 1.5 | 3 | 1.6 | 2.57 | 0.2 | 60 | 4 | 18 |

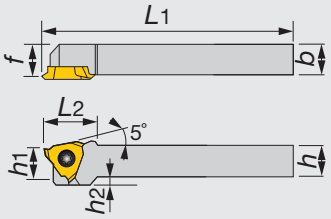
●:Line-up

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Grade | Cutting speed *Vc* (m/min) | Pitch (mm) | TPI |
|---|---|---|---|---|---|
| P | Low carbon steels (C15, C20 etc.) | AH725 | 60 - 150 | 0.8 - 3 | 32 - 8 |
| P | Carbon steels, Alloy steels (C55, 42CrMoS4 etc.) | AH725 | 60 - 150 | 0.8 - 3 | 32 - 8 |
| P | Prehardened steels (NAK80, PX5 etc.) | AH725 | 60 - 150 | 0.8 - 3 | 32 - 8 |
| M | Stainless steels (X5CrNi18-9, X5CrNiMo17-12-2 etc) | AH725 | 50 - 80 | 0.8 - 3 | 32 - 8 |
| K | Grey cast irons (250, 300 etc.) | AH725 | 50 - 100 | 0.8 - 3 | 32 - 8 |
| K | Ductile cast irons (400-15, 600-3 etc.) | AH725 | 50 - 100 | 0.8 - 3 | 32 - 8 |
| S | Titanium alloys (Ti-6Al-4V, etc.) | AH725 | 30 - 100 | 0.8 - 3 | 32 - 8 |
| S | Superalloys (Inconel718, etc.) | AH725 | 30 - 100 | 0.8 - 3 | 32 - 8 |

# J-SERIES
## JSTTR/L
External threading toolholders for small lathe






Right hand (R) shown.

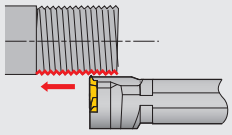
| Designation | h | b | L1 | L2 | h1 | f | h2 | Insert |
|---|---|---|---|---|---|---|---|---|
| JSTTR/L1010X3 | 10 | 10 | 120 | 18.5 | 10 | 9.5 | 2 | JTTR/L30... |
| JSTTR/L1212F3 | 12 | 12 | 85 | 18.5 | 12 | 11.5 | - | JTTR/L30... |
| JSTTR/L1212X3 | 12 | 12 | 120 | 18.5 | 12 | 11.5 | - | JTTR/L30... |
| JSTTR/L1616X3 | 16 | 16 | 120 | 16.5 | 16 | 15.5 | - | JTTR/L30... |

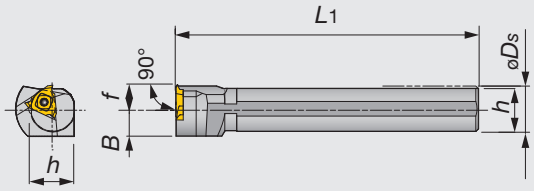
Recommend clamping torque: 1.2 N•m

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| JSTTR/L... | CSTB-4SD | T-8F |

# J-SERIES
## JS-TTL3
External threading toolholders for small lathe






Left hand (L) shown.

| Designation | øDs | f | L1 | h | B | Insert |
|---|---|---|---|---|---|---|
| JS19K-TTL3 | 19.05 | 10 | 125 | 18 | 11.5 | JTTR30... |
| JS20K-TTL3 | 20 | 10 | 125 | 19 | 11.5 | JTTR30... |
| JS22K-TTL3 | 22 | 10 | 125 | 21 | 11.5 | JTTR30... |
| JS25K-TTL3 | 25.4 | 10 | 125 | 24 | 12.7 | JTTR30... |

Recommend clamping torque: 3.5 N•m

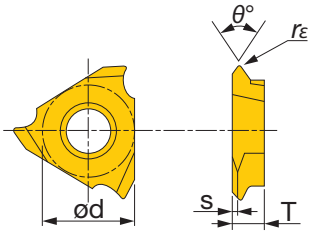
### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| JS**-TTL3 | CSTB-4S | T-15F |

## INSERT

### JTT (sharp edge)



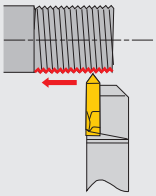


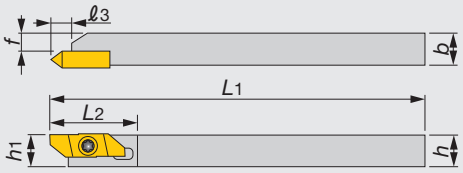

Right hand (R) shown.

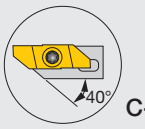
| Designation | rε | Coating | | | | Cermet | | Uncoated | | θ° | ød | T | s |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | SH725 | | J740 | | NS9530 | | TH10 | | | | | |
| | | R | L | R | L | R | L | R | L | | | | |
| JTTR/L3005F-55 | 0.05 | ● | | ● | | | | | | 55 | 9.525 | 3.18 | 0.6 |
| JTTR/L3005F | 0.05 | ● | ● | ● | | ● | | ● | | 60 | 9.525 | 3.18 | 0.9 |
| JTTR/L3010F | 0.1 | ● | ● | ● | | ● | | ● | | 60 | 9.525 | 3.18 | 0.9 |

Machinable pitch range: 0.5 to 1 mm.

● : Line-up






C-type

Right hand (R) shown.

| Designation | h | b | $L_1$ | $L_2$ | $\ell_3$ | $h_1$ | f | Insert |
|---|---|---|---|---|---|---|---|---|
| JSXBR1010K8-C | 10 | 10 | 125 | 29 | 6.4 | 10 | 5.7 | JXT*R... |
| JSXBR1212K8-C | 12 | 12 | 125 | 29 | 6.4 | 12 | 7.7 | JXT*R... |
| JSXBR1616K8 | 16 | 16 | 125 | 29 | 6.4 | 16 | 11.7 | JXT*R... |
| JSXBR2020K8 | 20 | 20 | 125 | 29 | 6.4 | 20 | 15.7 | JXT*R... |
| JSXBR2525K8 | 25 | 25 | 125 | 29 | 6.4 | 25 | 20.7 | JXT*R... |

- Can be wrenched from back side with both end torx screw.
- This toolholder is also compatible with JSXB-type insert for back turning.

## SPARE PARTS





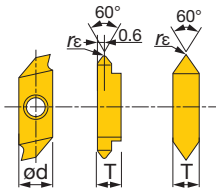
| Designation | Clamping screw | Wrench | |
|---|---|---|---|
| JSXBR... | CSTB-4SD | T-8F | (T-8L) |

T-8L is option part.

## INSERT

### JXT (sharp edge)






1-Type JXT1R　2-Type JXT2R

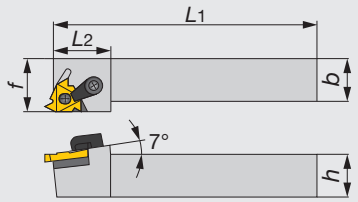
| Designation | rε | Coating J740 | Uncoated TH10 | θ° | ød | T |
|---|---|---|---|---|---|---|
| JXT1R6000F | 0.03 | ● | ● | 60 | 8 | 3.97 |
| JXT2R6000F | 0.03 | ● | ● | 60 | 8 | 3.97 |

Machinable pitch range: 0.5 to 1 mm

● : Line-up

# MTVNR/L-5

"TungThread"External threading toolholders for laydown inserts




Right hand (R) shown.

| Designation | *b* | *h* | $L_1$ | $L_2$ | *f* | Insert |
|---|---|---|---|---|---|---|
| MTVNR-2525M5 | 25 | 25 | 152 | 39 | 31.8 | L53 5B**EXT-FC |
| MTVNR-3232M5 | 32 | 32 | 178 | 39 | 38.1 | L53 5B**EXT-FC |

## SPARE PARTS

| Designation | Shim | Lock pin | Clamp | Clamping screw | Wrench |
|---|---|---|---|---|---|
| MTVNR... | LS53NOFORMEXT | NL-58 | TC-250 | STC-11 | 1/8HEX |

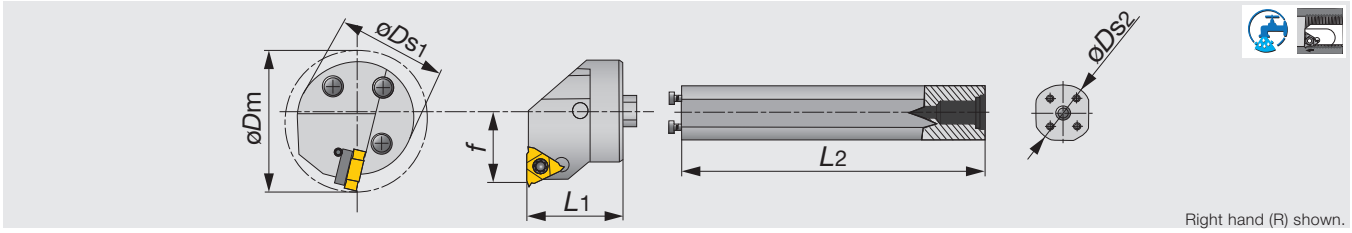


MTVNR/L-5: Inserts → **B428**

# HS-LNFR/L-53

Exchangeable internal threading heads for laydown inserts






Right hand (R) shown.

| Designation | øDm | øDs1 | f | L1 | Insert |
|---|---|---|---|---|---|
| HS40-LNFR-53 | 50 | 40 | 28.7 | 41.3 | L53 5B**INT-FC |
| HS50-LNFR-53 | 63 | 50 | 32.7 | 41.3 | L53 5B**INT-FC |

## SPARE PARTS

| Designation | Lock pin | Clamp | Clamping screw | Wrench |
|---|---|---|---|---|
| HS**-LNFR-53 | NL-56 | TC-250 | STC-11 | 1/8HEX |

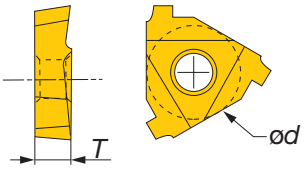
## Shank

| Designation | øDs2 | L2 |
|---|---|---|
| S-570-40M-40 | 40 | 273 |
| S-570-50M-50 | 50 | 366 |

## SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| S-570-40M-40 | SS100 | 5/32HEX |
| S-570-50M-50 | SS94 | 1/4EX |

## Full-profile insert (Single-sided)

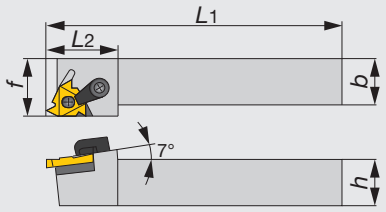



| Connection | TPI | Taper | | External insert | | | | Internal insert | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | mm/mm | TPF | Designation | Grade / Coating / AH725 | ød | T | Designation | Grade / Coating / AH725 | ød | T |
| API Buttress | 5 | 1/16 | 0.75 | L53 5B75 EXT-FC | ● | 15.875 | 4.8 | L53 5B75 INT-FC | ● | 15.875 | 4.8 |
| | 5 | 1/12 | 1 | L53 5B1 EXT-FC | ● | 15.875 | 4.8 | L53 5B1 INT-FC | ● | 15.875 | 4.8 |

● : Line-up

# MTVNR/L-54

External threading toolholder for laydown double-side inserts




Right hand (R) shown.

| Designation | *h* | *b* | $L_1$ | $L_2$ | *f* | Insert |
|---|---|---|---|---|---|---|
| MTVNR-3232M54 | 32 | 32 | 178 | 39 | 38.1 | LDS 54**FT-CB#... |

## SPARE PARTS

| Designation | Shim | Lock pin | Clamp | Clamping screw | Wrench |
|---|---|---|---|---|---|
| MTVNR-3232M54 | LS53NOFORMEXT | NL-58 | TC-250 | STC-11 | 1/8HEX |

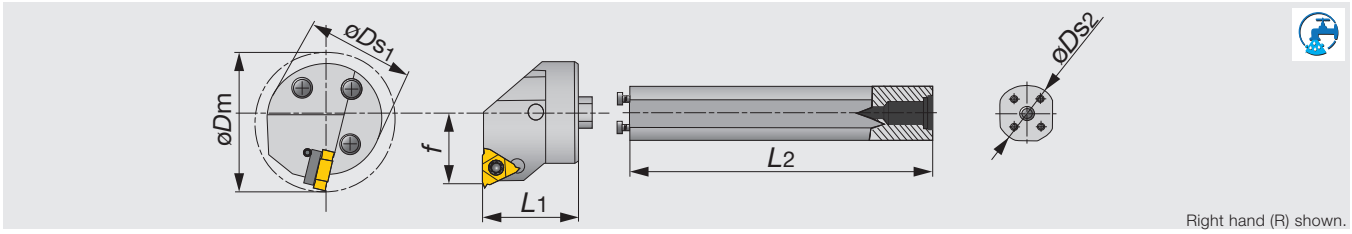


MTVNR/L-54: Inserts → **B430**

# HS-LNFR/L-54API

Exchangeable internal threading heads for laydown double-side inserts






Right hand (R) shown.

| Designation | øDm | øDs1 | f | L1 | Insert |
|---|---|---|---|---|---|
| HS40-LNFR-54API | 50 | 40 | 27 | 32 | LDS 54**FT-CB#... |
| HS50-LNFR-54API | 63 | 50 | 35 | 40 | LDS 54**FT-CB#... |

## SPARE PARTS

| Designation | Lock pin | Clamp | Clamping screw | Wrench |
|---|---|---|---|---|
| HS40-LNFR-54API | H410-1 | TC-250 | STC-11 | 1/8HEX |
| HS50-LNFR-54API | NL-56 | TC-250 | STC-11 | 1/8HEX |

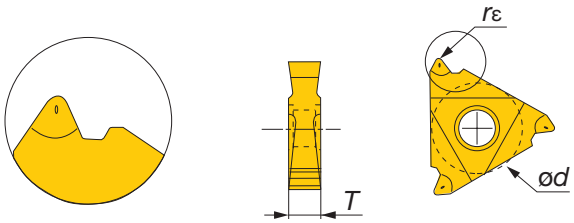
## Shank

| Designation | øDs2 | L2 |
|---|---|---|
| S-570-40M-40 | 40 | 273 |
| S-570-50M-50 | 50 | 366 |

## SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| S-570-40M-40 | SS100 | 5/32HEX |
| S-570-50M-50 | SS94 | 1/4EX |

## Full-profile insert (Double-sided)

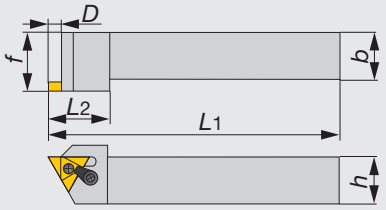



| Connection | TPI | Thread form | Taper mm/mm | Taper TPF | Designation | Grade Coating AH725 | ød | T | rε |
|---|---|---|---|---|---|---|---|---|---|
| API Rotary shoulder connection | 5 | V-0.040 | 1/4 | 3 | **LDS 54 530 FT-CB #5** | ● | 15.875 | 6.4 | 0.51 |
| | 4 | V-0.038R | 1/6 | 2 | **LDS 54 428 FT-CB #1** | ● | 15.875 | 6.4 | 0.97 |
| | 4 | V-0.038R | 1/4 | 3 | **LDS 54 438 FT-CB #2** | ● | 15.875 | 6.4 | 0.97 |
| | 4 | V-0.050 | 1/6 | 2 | **LDS 54 425 FT-CB #3** | ● | 15.875 | 6.4 | 0.64 |
| | 4 | V-0.050 | 1/4 | 3 | **LDS 54 435 FT-CB #4** | ● | 15.875 | 6.4 | 0.64 |

● : Line-up

# MTVOR/L

External multi-clamp toolholders for on edge inserts




Right hand (R) shown.

| Designation | *h* | *b* | $L_1$ | $L_2$ | *f* | D | Insert |
|---|---|---|---|---|---|---|---|
| MTVOR-2525M4 | 25 | 25 | 150 | 31 | 31.7 | 5.8 | TNM*43... |
| MTVOR-3232M4 | 32 | 32 | 178 | 31 | 38.1 | 5.8 | TNM*43... |
| MTVOR-2525M5 | 25 | 25 | 150 | 36 | 31.7 | 7.3 | TNM*54... |
| MTVOR-3232M5 | 32 | 32 | 178 | 36 | 38.1 | 7.3 | TNM*54... |

Note: For TNMC inserts, STVOR/L toolholder is recommended. Also, M-Type toolholder is available.

## SPARE PARTS

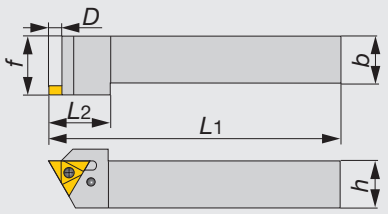
| Designation | Lock pin | Clamp | Clamping screw | Wrench |
|---|---|---|---|---|
| MTVOR-**M4 | NL-44 | TC-190 | STC-5 | 3/32HEX |
| MTVOR-**M5 | NL-56 | TC-250 | STC-11 | 1/8HEX |

MTVOR/L: Inserts → **B433**

# TUNGTHREAD

## STVOR/L

External screw-on toolholders for on edge inserts




Right hand (R) shown.

| Designation | h | b | L1 | L2 | f | D | Insert |
|---|---|---|---|---|---|---|---|
| STVOR-2525M4 | 25 | 25 | 152 | 31 | 31.7 | 5.8 | TNMC43... |
| STVOR-3232M4 | 32 | 32 | 178 | 31 | 38.1 | 5.8 | TNMC43... |
| STVOR-2525M5 | 25 | 25 | 152 | 36 | 31.7 | 7.3 | TNMC54... |
| STVOR-3232M5 | 32 | 32 | 178 | 36 | 38.1 | 7.3 | TNMC54... |

### SPARE PARTS

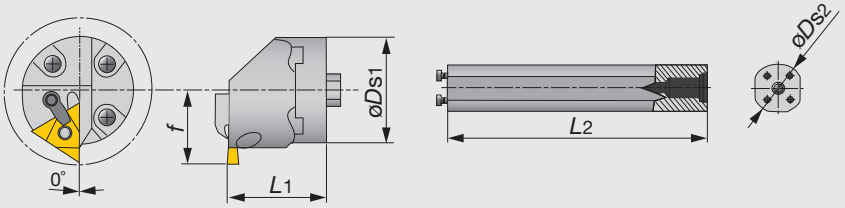
| Designation | Clamping screw | Clamp | Clamping screw | Wrench | |
|---|---|---|---|---|---|
| STVOR-**M4 | SD2 | (TC-190) | (STC-9) | T20TORX | 3/32HEX |
| STVOR-**M5 | SD3 | (TC-250) | (STC-11) | T20TORX | 1/8HEX |

Clamp and clamping screw are option parts.

# TUNGTHREAD

## HS-MTHOR/L

Exchangeable internal threading heads, for on edge insert, applicable on S-570 shanks




Right hand (R) shown.

| Designation | øDm | øDs1 | f | L1 | Insert |
|---|---|---|---|---|---|
| HS40-MTHOR-4 | 66.7 | 40 | 30.6 | 32 | TNM*43... |
| HS50-MTHOR-4 | 73 | 50 | 35.9 | 40 | TNM*43... |
| HS40-MTHOR-5 | 81.3 | 40 | 30.6 | 32 | TNM*54... |
| HS50-MTHOR-5 | 82.6 | 50 | 35.9 | 40 | TNM*54... |

### SPARE PARTS

| Designation | Lock pin | Clamp | Clamping screw | Wrench |
|---|---|---|---|---|
| HS**-MTHOR-4 | NL-44 | TC-190 | STC-5 | 3/32HEX |
| HS**-MTHOR-5 | NL-56 | TC-250 | STC-11 | 1/8HEX |

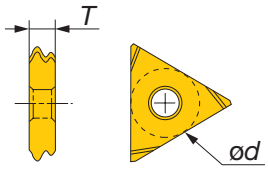
### Shank

| Designation | øDs2 | L2 |
|---|---|---|
| S-570-40M-40 | 40 | 273 |
| S-570-50M-50 | 50 | 366 |

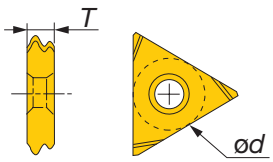
### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| S-570-40M-40 | SS100 | 5/32HEX |
| S-570-50M-50 | SS94 | 1/4EX |

## Full profile insert and partial topping insert




TNMA



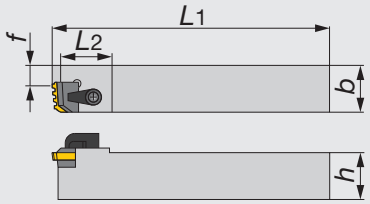

TNMC

| Connection | TPI | Taper | | External insert | | | | Internal insert | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | mm/mm | TPF | Designation | Grade / Coating / AH725 | ød | T | Designation | Grade / Coating / AH725 | ød | T |
| API Round | 10 | 1/16 | 0.75 | **TNMA 43 10RD EXT** | ● | 12.7 | 4.8 | **TNMA 43 10RD INT** | ● | 12.7 | 4.8 |
| | 8 | 1/16 | 0.75 | **TNMA 43 8RD EXT** | ● | 12.7 | 4.8 | **TNMA 43 8RD INT** | ● | 12.7 | 4.8 |
| API Buttress | 5 | 1/12 | 1 | **TNMA 54 5B1 EXT-FC** | ● | 15.875 | 6.4 | **TNMA 54 5B1 INT-FC** | ● | 15.875 | 6.4 |
| | 5 | 1/16 | 0.75 | **TNMA 54 5B75 EXT-FC** | ● | 15.875 | 6.4 | **TNMA 54 5B75 INT-FC** | ● | 15.875 | 6.4 |
| ACME (29° Trapezoid) | 16 | - | - | **TNMA43NT16PEXT-PT** | ● | 12.7 | 4.8 | - | - | - | - |
| | 14 | - | - | **TNMA43NT14PEXT-PT** | ● | 12.7 | 4.8 | - | - | - | - |
| | 12 | - | - | **TNMA43NT12PEXT-PT** | ● | 12.7 | 4.8 | - | - | - | - |
| | 10 | - | - | **TNMA43NT10PEXT-PT** | ● | 12.7 | 4.8 | - | - | - | - |
| | 8 | - | - | **TNMA43NT8PEXT-PT** | ● | 12.7 | 4.8 | - | - | - | - |
| | 6 | - | - | **TNMA43NT6PEXT-PT** | ● | 12.7 | 4.8 | - | - | - | - |
| | 5 | - | - | **TNMA54NT5PEXT-PT** | ● | 15.875 | 6.4 | - | - | - | - |
| | 4 | - | - | **TNMA54NT4PEXT-PT** | ● | 15.875 | 6.4 | - | - | - | - |
| | 3 | - | - | **TNMA54NT3PEXT-PT** | ● | 15.875 | 6.4 | - | - | - | - |
| STUB ACME (29° Trapezoid) | 16 | - | - | **TNMA43NT16PSTUBE-PT** | ● | 12.7 | 4.6 | - | - | - | - |
| | 14 | - | - | **TNMA43NT14PSTUBE-PT** | ● | 12.7 | 4.6 | - | - | - | - |
| | 12 | - | - | **TNMA43NT12PSTUBE-PT** | ● | 12.7 | 4.6 | - | - | - | - |
| | 10 | - | - | **TNMA43NT10PSTUBE-PT** | ● | 12.7 | 4.6 | - | - | - | - |
| | 8 | - | - | **TNMA43NT8PSTUBE-PT** | ● | 12.7 | 4.6 | - | - | - | - |
| | 6 | - | - | **TNMA43NT6PSTUBE-PT** | ● | 12.7 | 4.6 | - | - | - | - |
| | 5 | - | - | **TNMA54NT5PSTUBE-PT** | ● | 15.875 | 6.4 | - | - | - | - |
| | 4 | - | - | **TNMA54NT4PSTUBE-PT** | ● | 15.875 | 6.4 | - | - | - | - |
| | 3 | - | - | **TNMA54NT3PSTUBE-PT** | ● | 15.875 | 6.4 | - | - | - | - |
| API Round | 10 | 1/16 | 0.75 | **TNMC 43 10RD EXT** | ● | 12.7 | 4.8 | **TNMC 43 10RD INT** | ● | 12.7 | 4.8 |
| | 8 | 1/16 | 0.75 | **TNMC 43 8RD EXT** | ● | 12.7 | 4.8 | **TNMC 43 8RD INT** | ● | 12.7 | 4.8 |
| API Buttress | 5 | 1/12 | 1 | **TNMC 54 5B1 EXT-FC** | ● | 15.875 | 6.4 | **TNMC 54 5B1 INT-FC** | ● | 15.875 | 6.4 |
| | 5 | 1/16 | 0.75 | **TNMC 54 5B75 EXT-FC** | ● | 15.875 | 6.4 | **TNMC 54 5B75 INT-FC** | ● | 15.875 | 6.4 |
| ACME (29° Trapezoid) | 16 | - | - | **TNMC43NT16PEXT-PT** | ● | 12.7 | 4.8 | - | - | - | - |
| | 14 | - | - | **TNMC43NT14PEXT-PT** | ● | 12.7 | 4.8 | - | - | - | - |
| | 12 | - | - | **TNMC43NT12PEXT-PT** | ● | 12.7 | 4.8 | - | - | - | - |
| | 10 | - | - | **TNMC43NT10PEXT-PT** | ● | 12.7 | 4.8 | - | - | - | - |
| | 8 | - | - | **TNMC43NT8PEXT-PT** | ● | 12.7 | 4.8 | - | - | - | - |
| | 6 | - | - | **TNMC43NT6PEXT-PT** | ● | 12.7 | 4.8 | - | - | - | - |
| | 5 | - | - | **TNMC54NT5PEXT-PT** | ● | 15.875 | 6.4 | - | - | - | - |
| | 4 | - | - | **TNMC54NT4PEXT-PT** | ● | 15.875 | 6.4 | - | - | - | - |
| | 3 | - | - | **TNMC54NT3PEXT-PT** | ● | 15.875 | 6.4 | - | - | - | - |
| STUB ACME (29° Trapezoid) | 16 | - | - | **TNMC43NT16PSTUBE-PT** | ● | 12.7 | 4.8 | - | - | - | - |
| | 14 | - | - | **TNMC43NT14PSTUBE-PT** | ● | 12.7 | 4.8 | - | - | - | - |
| | 12 | - | - | **TNMC43NT12PSTUBE-PT** | ● | 12.7 | 4.8 | - | - | - | - |
| | 10 | - | - | **TNMC43NT10PSTUBE-PT** | ● | 12.7 | 4.8 | - | - | - | - |
| | 8 | - | - | **TNMC43NT8PSTUBE-PT** | ● | 12.7 | 4.8 | - | - | - | - |
| | 6 | - | - | **TNMC43NT6PSTUBE-PT** | ● | 12.7 | 4.8 | - | - | - | - |
| | 5 | - | - | **TNMC54NT5PSTUBE-PT** | ● | 15.875 | 6.4 | - | - | - | - |
| | 4 | - | - | **TNMC54NT4PSTUBE-PT** | ● | 15.875 | 6.4 | - | - | - | - |
| | 3 | - | - | **TNMC54NT3PSTUBE-PT** | ● | 15.875 | 6.4 | - | - | - | - |

• For ACME and STUB-ACME inserts can cut crest radius. Crest flat of ACME and STUB-ACME have to cut by another tool.

● : Line-up

# TUNGTHREAD
## CLVOR
External toolholders for the chaser inserts




Right-hand (R) shown.

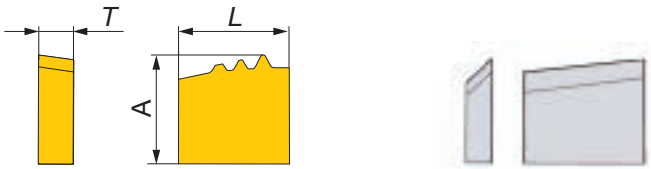
| Designation | f | L1 | L2 | h | b | Insert |
|---|---|---|---|---|---|---|
| CLVOR-25M6 | 16.1 | 177.8 | 32 | 25 | 25 | CR-8R/10R/11.5NPT/8NPT-3E/4E |
| CLVOR-32M6 | 16.1 | 177.8 | 32 | 32 | 32 | CR-8R/10R/11.5NPT/8NPT-3E/4E |
| CLVOR-40M8 | 29.8 | 179.1 | 32 | 40 | 40 | CR-5B75-4E |

### SPARE PARTS



| Designation | Shim | Shim screw | Clamp | Clamping screw | Wrench | |
|---|---|---|---|---|---|---|
| CLVOR-25M6 | TF1207 | SF80 | TC-311 | STC-4 | T-25TORX | 5/32HEX |
| CLVOR-32M6 | TF1207 | SF85 | TC-311 | STC-4 | T-25TORX | 5/32HEX |
| CLVOR-40M8 | TF8132-E | SF60 | TC-311 | STC-4 | T-20TORX | 5/32HEX |

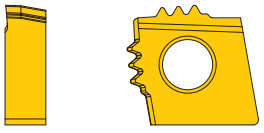
### Full profile insert (chaser)




| Connection | TPI | Taper | | Designation | AH725 | L | A | T | Breakerpiece |
|---|---|---|---|---|---|---|---|---|---|
| | | mm/mm | TPF | | | | | | |
| API Round | 8 | 1/16 | 0.75 | **CR-8R-3E** | ● | 16 | 15 | 5.2 | CR-8R / 10R-3E / 4E-CB |
| | 10 | 1/16 | 0.75 | **CR-10R-3E** | ● | 16 | 15.9 | 5.2 | CR-8R / 10R-3E / 4E-CB |
| API Buttress | 5 | 1/16 | 0.75 | **CR-5B75-4E** | ● | 20.4 | 15.9 | 5.1 | CR-5B75 / 5BI-4E-CB |
| NPT | 11.5 | 1/16 | 0.75 | **CR-11.5NPT-4E** | ● | 15.9 | 15.7 | 4.76 | CR-8R / 10R-3E / 4E-CB |
| | 8 | 1/16 | 0.75 | **CR-8NPT-4E** | ● | 15.9 | 15.7 | 5.2 | CR-8R / 10R-3E / 4E-CB |

# TUNGTHREAD
## CNGA-3E
API Round & buttress chaser insert with 2 corners for turning

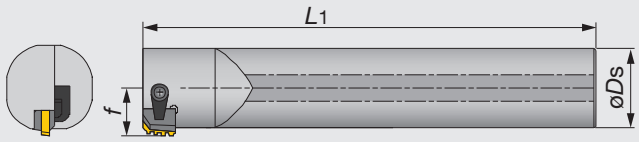
### Full profile insert (chaser)



| Connection | TPI | Taper | | Designation | AH725 |
|---|---|---|---|---|---|
| | | mm/mm | TPF | | |
| API Round | 10 | 1/16 | 0.75 | **CNGA-10R-3E** | ● |
| | 8 | 1/16 | 0.75 | **CNGA-8R-3E** | ● |
| API Buttress | 5 | 1/16 | 0.75 | **CNGA-5B75-3E** | ● |

Note: Toolholder should be designed and ordered individualy.

● : Line-up




Right-hand (R) shown.

| Designation | øDm | øDs | f | L1 | Insert |
|---|---|---|---|---|---|
| SI-CLHOR-40M6 | 50.8 | 40 | 23.16 | 400 | CR-**I |

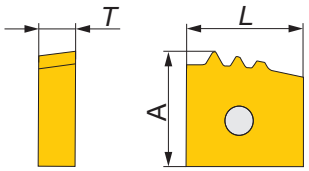
## SPARE PARTS

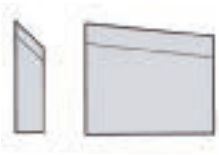




| Designation | Clamp | Clamping screw | Wrench |
|---|---|---|---|
| SI-CLHOR-40M6 | TC-311 | STC-8 | 5/32HEX |

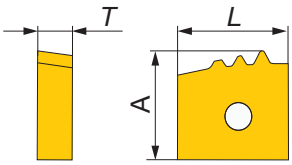
## Full profile insert (chaser)



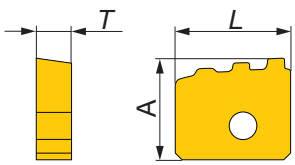



| Connection | TPI | Taper | | Designation | AH725 | L | A | T | Breakerpiece |
|---|---|---|---|---|---|---|---|---|---|
| | | mm/mm | TPF | | | | | | |
| API Round | 8 | 1/16 | 0.75 | **CR-8R-3I** | ● | 16 | 15 | 5.2 | CR-8R / 10R-3I / 4I-CB |
| | 10 | 1/16 | 0.75 | **CR-10R-3I** | ● | 16 | 15.9 | 5.2 | CR-8R / 10R-3I / 4I-CB |
| API Buttress | 5 | 1/16 | 0.75 | **CR-5B75-3I** | ● | 16 | 14.7 | 5.2 | CR-8R / 10R-3I / 4I-CB |
| NPT | 11.5 | 1/16 | 0.75 | **CR-11.5NPT-4I** | ● | 15.9 | 15.7 | 4.76 | CR-8R / 10R-3I / 4I-CB |
| | 8 | 1/16 | 0.75 | **CR-8NPT-4I** | ● | 15.9 | 15.7 | 5.2 | CR-8R / 10R-3I / 4I-CB |

● : Line-up




API Round




API Buttress

| Connection | TPI | Taper | | Designation | AH725 | *L* | A | *T* | Breakerpiece |
|---|---|---|---|---|---|---|---|---|---|
| | | mm/mm | TPF | | | | | | |
| API Round | 8 | 1/16 | 0.75 | **CR-8R-3E #1** | ● | 16 | 14.7 | 5.2 | TD39318R-1-CBW/CAVITY |
| | 8 | 1/16 | 0.75 | **CR-8R-3E #2** | ● | 16 | 14.9 | 5.2 | TD39328R-2-CBW/CAVITY |
| | 8 | 1/16 | 0.75 | **CR-8R-3E #3** | ● | 16 | 15 | 5.2 | TD39338R-3-CBW/CAVITY |
| API Buttress | 5 | 1/16 | 0.75 | **CR-5B75-3E #1** | ● | 17 | 14.6 | 5.2 | TD46015B75-1-CBW/CAVITY |
| | 5 | 1/16 | 0.75 | **CR-5B75-3E #2** | ● | 17 | 14.8 | 5.2 | TD46025B75-2-CBW/CAVITY |
| | 5 | 1/16 | 0.75 | **CR-5B75-3E #3** | ● | 17 | 15 | 5.2 | TD46035B75-3-CBW/CAVITY |

● : Line-up

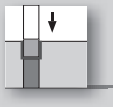
MEMO

# GrooveLine



# PARTING, GROOVING & GROOVE-TURN SYSTEM

Member IMC Group Tungaloy



## Parting, Grooving & Groove-Turn System C002

# GrooveLine - Parting, Grooving & Groove-Turn System



## TETRAFORCECUT

C041

4-cornered inserts with good clamping rigidity for highly precise grooving and parting

*W* = 0.5 - 3.18 mm



## TETRAMINICUT

C049

Unique insert geometry for highly precise grooving

*W* = 0.33 - 3.0 mm



## DUOJUSTCUT

C009

Innovative clamping system for stable parting operations

*W* = 1.0 - 2.0 mm



## EASYMULTICUT

C111

Multi-functional tool series for parting, grooving, and turning

*W* = 4.0 - 6.0 mm

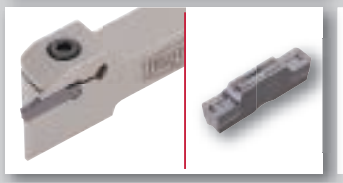


## TUNGHEAVYGROOVE

C123

Highly rigid clamping system for wide grooving and profiling in one pass

*W* = 10 - 25 mm



## TUNGCUT

C053

Multi-functional tool series for various grooving operations

*W* = 1.4 - 8.0 mm



## MY-T SERIES

C086

Variety tool series for a wide range of grooving and parting operations

*W* = 2.0 - 8.0 mm

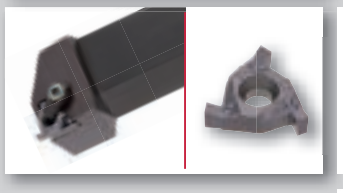


## TUNGT-CLAMP

C021

G-class inserts with precisely designed chipbreaker for grooving

*W* = 1.0 - 3.0 mm



## GTGNTYPE

C038

3-cornered inserts for grooving

*W* = 1.0 - 2.25 mm

## Other Grooving & Parting Tool

C014

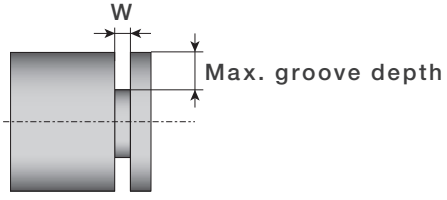
TetraForce-Cut

# External Grooving - Quick Guide

## Max. groove depth: 6.4 mm

| Series | W (mm) | Max. groove depth (mm) | |
|---|---|---|---|
| | | 1 2 3 4 5 6 | |
| TetraMini-Cut | 0.33 | 0.8 | C049 |
| | 0.43 - 0.5 | 1.2 | |
| | 0.75 - 1.75 | 2 | |
| | 2 - 3 | 2.5 | |
| JTGR/L | 0.33 | 0.7 | C019 |
| | 0.43 - 0.5 | 1.1 | |
| | 0.65 - 0.95 | 1.9 | |
| | 1 - 1.8 | 2.1 | |
| | 2 - 3 | 2.6 | |
| GBR/L32 | 0.33 | 0.8 | C035 |
| | 0.5 | 1.2 | |
| | 0.75 - 1.5 | 2 | |
| | 2 - 2.5 | 2.5 | |
| GBR/L43 | 1.25 - 1.45 | 2 | C035 |
| | 1.5 - 2.3 | 3.5 | |
| | 2.5 - 4.5 | 5 | |
| GX-R/LE | 1 | 1.5 | C030 |
| | 1.5 | 2.3 | |
| | 2 | 3 | |
| | 2.5 | 3.8 | |
| | 3 | 4.5 | |
| | 3.5 | 5.3 | |
| | 4 - 4.5 | 6 | |
| TetraForce-Cut | 0.5 - 0.75 | 2.5 | C041 |
| | 0.8 | 1.6 | |
| | 1 - 1.25 | 3.5 | |
| | 1.4 | 2 | |
| | 1.47 | 2.5 | |
| | 1.5 | 5.7 | |
| | 1.57 - 1.96 | 3 | |
| | 2 | 6.4 | |
| | 2.22 - 2.3 | 3.5 | |
| | 2.39 - 2.5 | 5.7 | |
| | 2.7 - 2.87 | 6.2 | |
| | 3 - 3.18 | 6.4 | |

Recommendation
Available

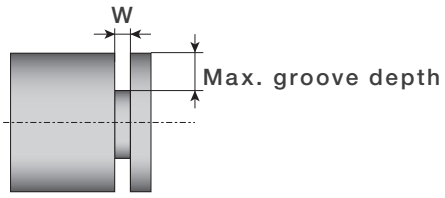


# External Grooving - Quick Guide

## Max. groove depth: 50 mm

| Series | W (mm) | Max. groove depth (mm) | |
|---|---|---|---|
| | | 10 20 30 40 50 | |
| MY-T FLEX | 3 | 10 | C104 |
| | 4 | 12 | |
| | 5 | 14 | |
| CTD | 3 - 4 | 14 | C106 |
| | 5 | 20 | |
| MY-T CGD | 2 | 16 | C102 |
| | 3 - 8 | 21.6 | |
| MY-T G series | 2 | 16 | C086 |
| | 3 | 22 | |
| | 4 - 5 | 25 | |
| TungCut | 1.4 | 16 | C053 |
| | 2 | 17 | |
| | 3 - 4 | 25 | |
| | 5 - 6 | 25 / 32 | |
| | 8 | 35 | |
| EasyMulti-Cut | 4 | 25 / 30 | C111 |
| | 5 | 25 / 32 | |
| | 6 | 25 / 35 | |
| TungHeavy Groove | 10 | 36 | C123 |
| | 15 | 40 | |
| | 20 | 40 | |
| | 25 | 50 | |

Recommendation
Available



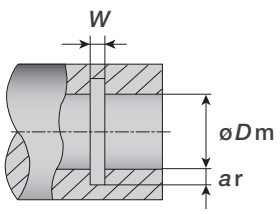

Grooving Tool

# Internal Grooving - Quick Guide



| Series | W (mm) | ar (mm) | øDm (mm) 10 20 30 40 50 | |
|---|---|---|---|---|
| SNG | 1 - 2 | 1.5 | 8 – 25 | C025 |
| | 1.5 - 3.5 | 2 | 14 – 25 | |
| | 1.5 - 3.5 | 3 | 20 – 25 | |
| EasyMulti-Cut | 4 | 6 | 20 – 25 | C111 |
| | | 9 | 25 | |
| | | 11 | 32 | |
| | 5 | 11 | 40 | |
| | 6 | 11 | 40 | |
| TungCut | 2 | 6 | 25 | C053 |
| | | 8 | 25 | |
| | 3 | 6 | 25 | |
| | | 5.1 | 25 | |
| | | 8 | 32 | |
| | | 10 | 40 | |
| | 4 | 6 | 25 | |
| | | 8 | 32 | |
| | | 4 | 31 | |
| | | 10 | 40 | |
| | 5 | 5 | 31 | |
| | | 10 | 40 | |
| | 6 | 4 | 31 | |
| | | 10 | 40 | |
| | 8 | 5 | 37 | |
| | | 5.8 | 42 | |
| MY-T G series | 3 | 3.5 | 25 | C086 |
| | | 5 | 32 | |
| | 4 | 5 | 32 | |
| | | 6 | 40 | |
| | 5 | 5 | 32 | |
| | | 6 | 40 | |
| GBR/L32 | 0.33 | 0.8 | 32 | C034 |
| | 0.5 | 1.2 | 32 | |
| | 0.75 - 2.5 | 2 | 32 | |

Recommendation
Available

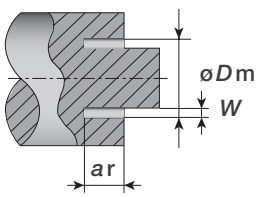


# Face Grooving - Quick Guide



| Series | W (mm) | ar (mm) | øD (mm) 50 100 150 200 250 300 400 500 | |
|---|---|---|---|---|
| FGC | 3 | 10 | 30 – 120 | C128 |
| | 4 | 10 | 30 – 120 | |
| | | 20 | 30 – 120 | |
| | 5 | 12 | 30 – 120 | |
| | | 22 | 30 – 120 | |
| | 6 | 14 | 40 – 120 | |
| | 8 | 16 | 60 – 120 | |
| TungCut | 3 | 10 | 30 – 50 | C053 |
| | | 12 | 46 – 200 | |
| | | 15 | 50 – 100 | |
| | 4 | 10 | 30 – 36 | |
| | | 12 | 30 – 40 | |
| | | 16 | 58 – 250 | |
| | | 20 | 36 – 200 | |
| | 5 | 20 | 60 – ∞ | |
| | | 25 | 60 – 200 | |
| | 6 | 20 | 60 – 250 | |
| | | 25 | 60 – 400 | |
| MY-T G series | 3 | 10 | 30 – 500 | C086 |
| | | 14 | 30 – 500 | |
| | 4 | 14 | 35 – 500 | |
| | | 22 | 35 – 500 | |
| | 5 | 14 | 35 – 500 | |
| | | 22 | 35 – 500 | |
| EasyMulti-Cut | 4 | 50 | 30 – 75 | C111 |
| | | 65 | 75 – 500 | |
| | 5 | 50 | 35 – 75 | |
| | | 65 | 75 – 500 | |
| | 6 | 50 | 45 – 75 | |
| | | 65 | 75 – 500 | |
| GX-F | 1 | 1.5 | 55 – ∞ | C032 |
| | 1.5 | 2.3 | 55 – ∞ | |
| | 2 | 3 | 55 – ∞ | |
| | 2.5 | 3.8 | 55 – ∞ | |
| | 3 | 4.5 | 55 – ∞ | |
| | 3.5 | 5.3 | 55 – ∞ | |
| | 4 - 4.5 | 6 | 55 – ∞ | |

Recommendation
Available

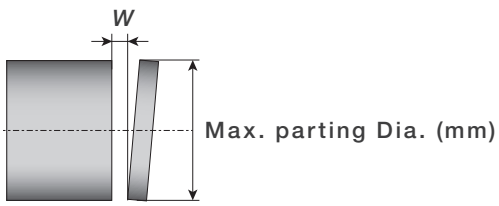


# Parting off - Quick Guide

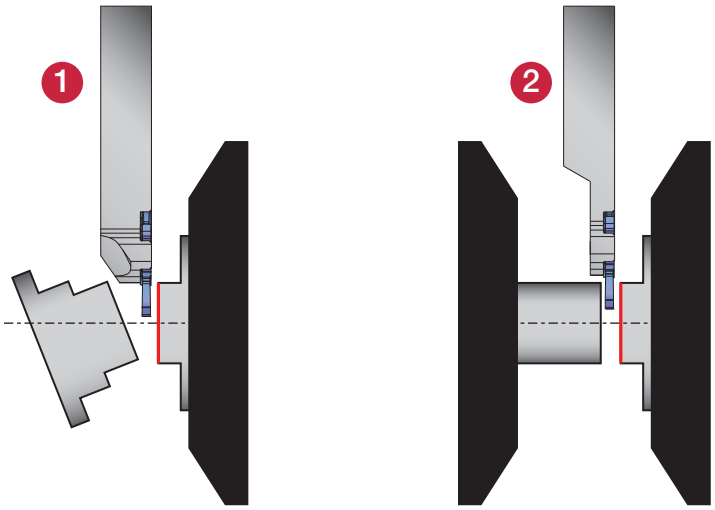


| Series | W (mm) | Max. parting Dia. (mm) | |
|---|---|---|---|
| | | 10 20 40 60 80 100 200 | |
| TetraForce-Cut | 0.5 - 0.75 | 5 | C041 |
| | 0.8 | 3.2 | |
| | 1 - 1.25 | 5 | |
| | 1.4 | 4 | |
| | 1.47 | 5 | |
| | 1.5 | 11.4 | |
| | 1.57 - 1.96 | 6 | |
| | 2 | 12.8 | |
| | 2.2 - 2.3 | 7 | |
| | 2.39 - 2.5 | 11.4 | |
| | 2.7 - 2.87 | 12.4 | |
| | 3 - 3.18 | 12.8 | |
| DuoJust-Cut | 1 | 6 | C009 |
| | 1.5 | 16 | |
| | 2 | 16 | |
| MY-T | 2 | 50 | C086 |
| | 3 | 100 | |
| | 4 | 100 | |
| | 5 | 120 | |
| TungCut | 1.4 | 29 | C053 |
| | 2 | 12.8 50 | |
| | 3 | 12.8 100 | |
| | 4 | 50 120 | |
| | 5 | 50 120 | |
| | 6 | 50 120 | |
| | 8 | 80 | |
| EasyMulti-Cut | 4 | 50 100 | C111 |
| | 5 | 50 120 | |
| | 6 | 50 120 | |

Recommendation
Available



# Great cutting performance in **various parting-off operations**




**1 JSXXR/L**
*W* = 1 - 2 mm
Max. parting Dia.:
16 mm
Shank size:
10 - 20 mm
C010

**2 JSXXR/L - S**
*W* = 1 - 2 mm
Max. parting Dia.:
16 mm
Shank size:
10 - 12 mm
C010



**3 types of inserts** that are available for different parting-off diameters can be mounted **on the same pocket of the toolholder.**

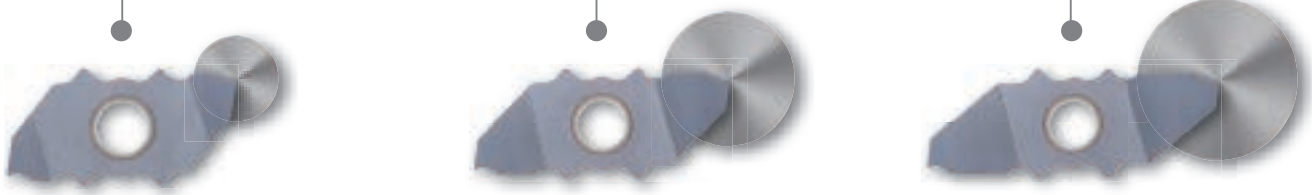
- Optimized overhang length for **stable machining**

Regular-type toolholder




Toolholder for sub-spindle



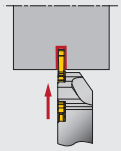
**JXPG06**
Max. parting-off dia.
**ø6 mm**

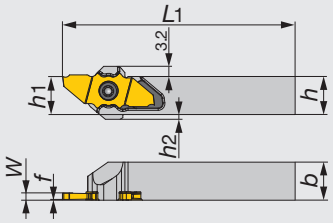
**JXPG12**
Max. parting-off dia.
**ø12 mm**

**JXPG16**
Max. parting-off dia.
**ø16 mm**

## JSXXR/L

Parting off tool for swiss lathes






Right hand (R) shown.

| Designation | W | h | b | f | L1* | h1 | h2 | Insert |
|---|---|---|---|---|---|---|---|---|
| JSXXR/L1010X09 | 1 - 2 | 10 | 10 | 0.2 | ≤120 | 10 | 3 | JXPG06...,12...,16... |
| JSXXR/L1212F09 | 1 - 2 | 12 | 12 | 0.2 | ≤85 | 12 | 1.5 | JXPG06...,12...,16... |
| JSXXR/L1212X09 | 1 - 2 | 12 | 12 | 0.2 | ≤120 | 12 | 1.5 | JXPG06...,12...,16... |
| JSXXR/L1616X09 | 1 - 2 | 16 | 16 | 0.2 | ≤120 | 16 | - | JXPG06...,12...,16... |
| JSXXR/L2020H09 | 1 - 2 | 20 | 20 | 0.2 | ≤100 | 20 | - | JXPG06...,12...,16... |

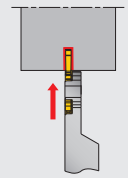
* "*L*1" is calculated with JXPG16*** insert. When JXPG12*** insert is used, "*L*1" is shorter 2 mm.
When JXPG06*** insert is used, "*L*1" is shorter 4 mm.
Note: The right hand insert (JXPG**R***) is used for the right hand toolholders (JSXXR***), and the left hand insert (JXPG**L***) is used for the left hand toolholders (JSXXL***).

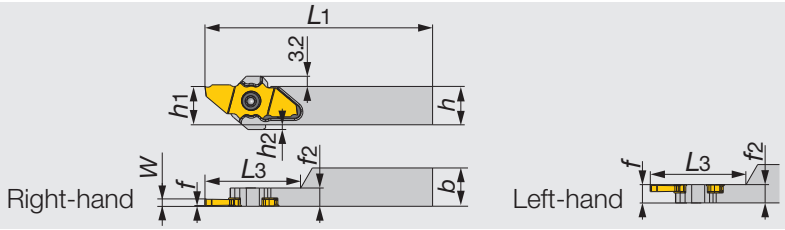
### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| JSXXR... | CSTC-4L100DL | T-1008/5 |
| JSXXL... | CSTC-4L100DR | T-1008/5 |

## JSXXR/L-S

Parting off tool for sub spindle in swiss lathes






| Designation | W | h | b | f | L1* | L3* | h1 | h2 | f2 | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| JSXXR/L1010X09-S | 1 - 2 | 10 | 10 | 0.2/5.5 | ≤120 | ≤26 | 10 | 3 | 5.7 | JXPG06...,12...,16... |
| JSXXR/L1212F09-S | 1 - 2 | 12 | 12 | 0.2/5.5 | ≤85 | ≤26 | 12 | 1.5 | 5.7 | JXPG06...,12...,16... |
| JSXXR/L1212X09-S | 1 - 2 | 12 | 12 | 0.2/5.5 | ≤120 | ≤30 | 12 | 1.5 | 5.7 | JXPG06...,12...,16... |

* "*L*1" and "*L*3" are calculated with JXPG16*** insert. When JXPG12*** insert is used, "*L*1" and "*L*3" are 2 mm shorter.
When JXPG06*** insert is used, "*L*1" and "*L*3" are 4 mm shorter.
Note: The right-hand insert (JXPG**R***) is used for the right-hand toolholder (JSXXR***), and the left-hand insert (JXPG**L***) is used for the left-hand toolholder (JSXXL***).

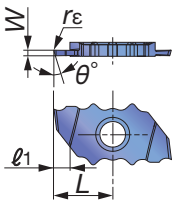
### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| JSXXR*****-S | CSTC-4L055DL | T-1008/5 |
| JSXXL*****-S | CSTC-4L055DR | T-1008/5 |

## INSERT

### JXPG06R/L-F (sharp edge)





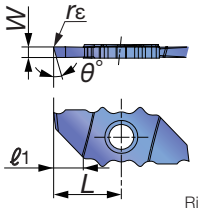

Right hand (R) shown.

| Designation | W±0.025 | rε | SH725 R | SH725 L | Dmax | L | θ° | ℓ1 |
|---|---|---|---|---|---|---|---|---|
| JXPG06R/L10F | 1 | 0.05 | ● | ● | 6 | 10.5 | 0 | 2.65 |
| JXPG06R/L15F | 1.5 | 0.05 | ● | ● | 6 | 10.5 | 0 | 2.65 |
| JXPG06R/L10F-15 | 1 | 0.05 | ● | ● | 6 | 10.5 | 15 | 2.65 |
| JXPG06R/L15F-15 | 1.5 | 0.05 | ● | ● | 6 | 10.5 | 15 | 2.65 |

● : Line-up
*D*max: Max. parting off dia

### JXPG12R/L-F (sharp edge)





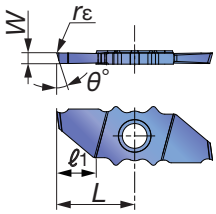

Right hand (R) shown.

| Designation | W±0.025 | rε | SH725 R | SH725 L | Dmax | L | θ° | ℓ1 |
|---|---|---|---|---|---|---|---|---|
| JXPG12R/L15F | 1.5 | 0.05 | ● | ● | 12 | 12.5 | 0 | 5.23 |
| JXPG12R/L20F | 2 | 0.05 | ● | ● | 12 | 12.5 | 0 | 5.23 |
| JXPG12R/L15F-15 | 1.5 | 0.05 | ● | ● | 12 | 12.5 | 15 | 5.23 |
| JXPG12R/L20F-15 | 2 | 0.05 | ● | ● | 12 | 12.5 | 15 | 5.23 |

● : Line-up
*D*max: Max. parting off dia

### JXPG16R/L-F (sharp edge)






Right hand (R) shown.

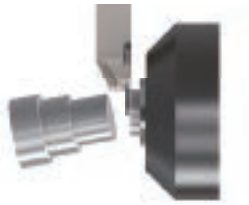
| Designation | W±0.025 | rε | SH725 R | SH725 L | Dmax | L | θ° | ℓ1 |
|---|---|---|---|---|---|---|---|---|
| JXPG16R/L15F | 1.5 | 0.05 | ● | ● | 16 | 14.5 | 0 | 6.96 |
| JXPG16R/L20F | 2 | 0.05 | ● | ● | 16 | 14.5 | 0 | 6.96 |
| JXPG16R/L15F-15 | 1.5 | 0.05 | ● | ● | 16 | 14.5 | 15 | 6.96 |
| JXPG16R/L20F-15 | 2 | 0.05 | ● | ● | 16 | 14.5 | 15 | 6.96 |

● : Line-up
*D*max: Max. parting off dia

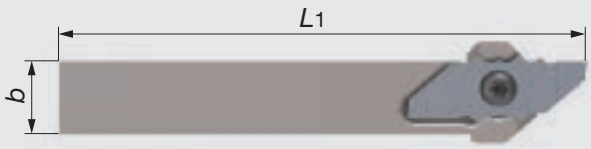
## STANDARD CUTTING CONDITIONS

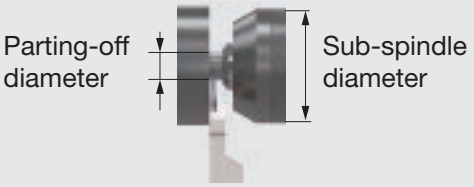
| ISO | Workpiece material | Grade | Cutting speed *Vc* (m/min) | Feed *f* (mm/rev) |
|---|---|---|---|---|
| P | Low carbon steels<br>C15, C20, etc. | SH725 | 50 - 200 | 0.01 - 0.05 |
| P | Carbon steels, Alloy steels<br>C55, 42CrMoS4, etc. | SH725 | 50 - 200 | 0.01 - 0.05 |
| P | Free cutting steels<br>X50CrSi8 2, etc. | SH725 | 50 - 200 | 0.01 - 0.05 |
| M | Stainless steels<br>X5CrNi18-9, X5CrNiMo17-12-2, etc. | SH725 | 50 - 200 | 0.01 - 0.05 |
| N | Aluminium alloys | SH725 | 150 - 200 | 0.01 - 0.05 |
| N | Copper alloy | SH725 | 100 - 200 | 0.01 - 0.05 |
| S | Titanium alloys<br>Ti-6Al-4V, etc. | SH725 | 30 - 80 | 0.01 - 0.05 |
| S | Superalloys<br>Inconel718, etc. | SH725 | 30 - 80 | 0.01 - 0.05 |

## HOW TO SELECT TOOLS

| | Large-diameter machining of workpiece with rigitity | | Small-diameter machining of workpiece with short overhang | |
|---|---|---|---|---|
| | Main-spindle tooling | Sub-spindle tooling | Sub-spindle tooling | |
| | | | Workpiece with long overhang at the side of sub-spindle for the process after parting-off | Short workpiece with low rigitity |
| **Application** |  <br>Main spindle |  <br>Sub-spindle Main spindle |  <br>Sub-spindle Main spindle |  <br>Sub-spindle Main spindle |
| | Position of parting-off is at the side of the main spindle | Position of parting-off is at the side of the sub-spindle | Position of parting-off is at the side of the main spindle | Position of parting-off is at the side of the sub-spindle |
| **Toolholder** | R-hand (JSXXR type) | L-hand (JSXXL type) | R-hand (JSXXR-S type) | L-hand (JSXXL-S type) |
| **Insert** | Right-hand insert with lead angle to remove center core (JXPG**R***-15 type) | Left-hand insert (JXPG**L*** type) | Right-hand insert (JXPG**R*** type) | Left-hand insert (JXPG**L*** type) |

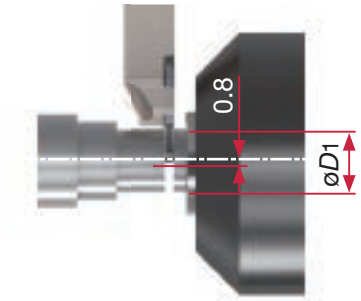
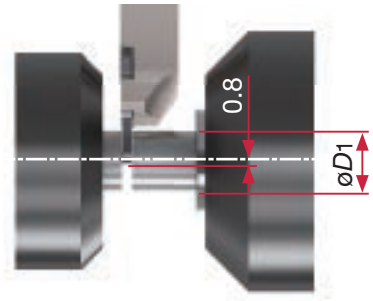
## HOW TO SELECT TOOLHOLDERS FOR SUB-SPINDLE



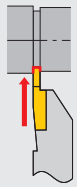

| Sub-spindle dia. | Max parting-off dia. | Shank size b | Tool length $L_1$ | Insert | Toolholder |
|---|---|---|---|---|---|
| ø40 | ~ ø6 | 10 | 116 | JXPG06... | JSXXR/L1010X09-S |
| ø40 | ~ ø6 | 12 | 81 | JXPG06... | JSXXR/L1212F09-S |
| ø40 | ~ ø12 | 10 | 118 | JXPG12... | JSXXR/L1010X09-S |
| ø40 | ~ ø12 | 12 | 83 | JXPG12... | JSXXR/L1212F09-S |
| ø40 | ~ ø16 | 10 | 120 | JXPG16... | JSXXR/L1010X09-S |
| ø40 | ~ ø16 | 12 | 85 | JXPG16... | JSXXR/L1212F09-S |
| ø50 | ~ ø6 | 12 | 116 | JXPG06... | JSXXR/L1212X09-S |
| ø50 | ~ ø12 | 12 | 118 | JXPG12... | JSXXR/L1212X09-S |
| ø50 | ~ ø16 | 12 | 85 | JXPG16... | JSXXR/L1212F09-S |
| ø50 | ~ ø16 | 12 | 120 | JXPG16... | JSXXR/L1212X09-S |

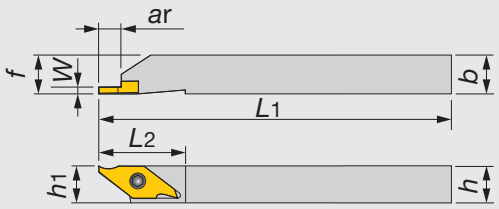
## MAX. PARTING-OFF DIA. & DEPTH

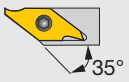
| Main-spindle tooling | Sub-spindle tooling |
|---|---|
|  |  |
| Main spindle | Sub-spindle Main spindle |



The cutting edge reaches 0.8 mm beyond the center line in parting-off.
ø$D_1$ = Max. parting-off dia.






Right hand (R) shown.

| Designation | W | ar | h | b | $L_1$ | $L_2$ | $h_1$ | f | Insert |
|---|---|---|---|---|---|---|---|---|---|
| JSVGR/L1010K-C | 0.33 - 2 | 0.7 - 5.5 | 10 | 10 | 125 | 23 | 10 | 10 | JVGR/L... |
| JSVGR/L1212K-C | 0.33 - 2 | 0.7 - 5.5 | 12 | 12 | 125 | 23 | 12 | 12 | JVGR/L... |
| JSVGR/L1616K | 0.33 - 2 | 0.7 - 5.5 | 16 | 16 | 125 | 23 | 16 | 16 | JVGR/L... |

• Recommend clamping torque: 2.3 N•m.

| Designation | Applicable insert |
|---|---|
| JSVGR/L1010K-C | JVGR/L... |
| JSVGR/L1212K-C | JVGR/L... |
| JSVGR/L1616K | JVGR/L... |

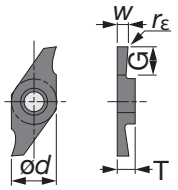
SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| JSVGR/L... | CSTB-3S | T-9F(Optional T-9L) |



## APPLICABLE INSERT

### JVG-type (sharp edge)



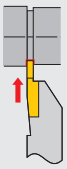

Right hand (R) shown.

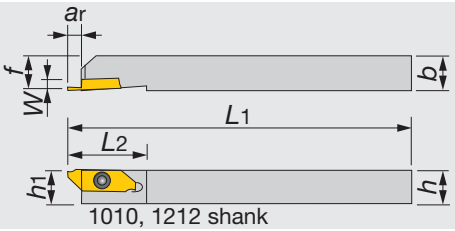
| Designation | $W^{+0.05}_{0}$ | $r_\varepsilon$ | Coating | | | | Cermet | | Uncoated | | ød | T | G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | J740 | | SH725 | | NS9530 | | TH10 | | | | |
| | | | R | L | R | L | R | L | R | L | | | |
| JVGR/L033F | 0.33 | 0 | ● | | ● | ● | | | ● | | 7.94 | 3.18 | 0.7 |
| JVGR/L050F | 0.5 | 0 | ● | | ● | ● | | | ● | | 7.94 | 3.18 | 1.1 |
| JVGR/L075F | 0.75 | 0 | ● | | ● | ● | | | ● | | 7.94 | 3.18 | 1.9 |
| JVGR/L095F | 0.95 | 0 | ● | | ● | ● | | | ● | | 7.94 | 3.18 | 1.9 |
| JVGR/L100F | 1 | 0 | ● | | ● | ● | ● | ● | ● | ● | 7.94 | 3.18 | 5.5 |
| JVGR/L125F | 1.25 | 0 | ● | | ● | ● | | | ● | | 7.94 | 3.18 | 5 |
| JVGR/L150F | 1.5 | 0 | ● | | ● | ● | ● | ● | ● | ● | 7.94 | 3.18 | 5.5 |
| JVGR/L200F | 2 | 0 | ● | | ● | ● | ● | | ● | | 7.94 | 3.18 | 5.5 |

● : Line-up

# JSXGR/L

## No-offset screw-on toolholder for front & reverseturning & external grooving






without offset



1616, 2020, 2525 shank

Right hand (R) shown.

| Designation | W | ar | h | b | $L_1$ | $L_2$ | $h_1$ | f | Insert |
|---|---|---|---|---|---|---|---|---|---|
| JSXGR/L1010K8-C | 0.7 - 2 | 4.5 - 6 | 10 | 10 | 125 | 29 | 10 | 9.9 | JXG... |
| JSXGR/L1212K8-C | 0.7 - 2 | 4.5 - 6 | 12 | 12 | 125 | 29 | 12 | 11.9 | JXG... |
| JSXGR/L1616K8 | 0.7 - 2 | 4.5 - 6 | 16 | 16 | 125 | 29 | 16 | 15.9 | JXG... |
| JSXGR/L2020K8 | 0.7 - 2 | 4.5 - 6 | 20 | 20 | 125 | 29 | 20 | 19.9 | JXG... |
| JSXGR/L2525K8 | 0.7 - 2 | 4.5 - 6 | 25 | 25 | 125 | 29 | 25 | 24.9 | JXG... |

• Can be wrenched from back side with double socket torx screw. •JSXGR/L-type toolholders are used for JXG-type grooving inserts, JXF-type front-turning inserts and JXR-type reverse-turning inserts.

### SPARE PARTS

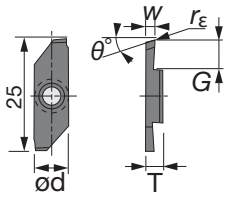




| Designation | Clamping screw | Wrench |
|---|---|---|
| JSXGR/L... | CSTB-4SD | T-8F |

## APPLICABLE INSERT

### JXG-type (with hand and sharp edge)



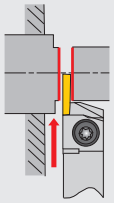

Right hand (R) shown.

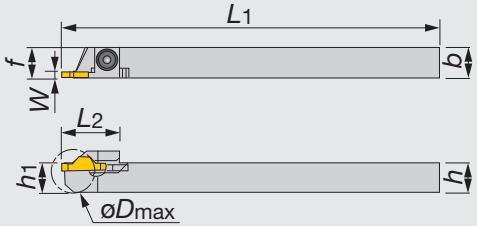
| Designation | W±0.025 | rε | Coating J740 R | Coating J740 L | Uncoated TH10 R | Uncoated TH10 L | ød | T | θ° | G |
|---|---|---|---|---|---|---|---|---|---|---|
| JXGR/L8070FA | 0.7 | 0 | ● | ● | ● | ● | 8 | 3.97 | 15 | 4.5 |
| JXGR/L8070FA-005 | 0.7 | 0.05 | ● | | | | 8 | 3.97 | 15 | 4.5 |
| JXGR/L8100FA | 1 | 0 | ● | ● | ● | ● | 8 | 3.97 | 15 | 6 |
| JXGR/L8100FA-005 | 1 | 0.05 | ● | | | | 8 | 3.97 | 15 | 6 |
| JXGR/L8100FA45 | 1 | 0 | ● | | ● | | 8 | 3.97 | 15 | 4.5 |
| JXGR/L8100FA45-005 | 1 | 0.05 | ● | | | | 8 | 3.97 | 15 | 4.5 |
| JXGR/L8150FA | 1.5 | 0 | ● | ● | ● | ● | 8 | 3.97 | 15 | 6 |
| JXGR/L8150FA-005 | 1.5 | 0.05 | ● | | | | 8 | 3.97 | 15 | 6 |
| JXGR/L8150FA50 | 1.5 | 0 | ● | | ● | | 8 | 3.97 | 15 | 5 |
| JXGR/L8150FA50-005 | 1.5 | 0.05 | ● | | | | 8 | 3.97 | 15 | 5 |
| JXGR/L8180FA | 1.8 | 0 | ● | | ● | | 8 | 3.97 | 15 | 6 |
| JXGR/L8180FA-005 | 1.8 | 0.05 | ● | | | | 8 | 3.97 | 15 | 6 |
| JXGR/L8200FA | 2 | 0 | ● | ● | ● | ● | 8 | 3.97 | 15 | 6 |
| JXGR/L8200FA-005 | 2 | 0.05 | ● | | | | 8 | 3.97 | 15 | 6 |
| JXGR/L8200FN | 2 | 0 | ● | ● | ● | ● | 8 | 3.97 | 0 | 6 |
| JXGR/L8200FN-005 | 2 | 0.05 | ● | | | | 8 | 3.97 | 0 | 6 |

● : Line-up

# JCCWSR/L

External parting toolholders for swiss lathes






Right hand (R) shown.

| Designation | W | øDmax | h | b | L1 | L2 | h1 | f | Insert |
|---|---|---|---|---|---|---|---|---|---|
| JCCWSR/L1010K2 | 2 | 20 | 10 | 10 | 125 | 19 | 10 | 10 | JCC*200... |
| JCCWSR/L1212K2 | 2 | 20 | 12 | 12 | 125 | 19 | 12 | 12 | JCC*200... |
| JCCWSR/L1616K2 | 2 | 20 | 16 | 16 | 125 | 19 | 16 | 16 | JCC*200... |
| JCCWSR/L2020K2 | 2 | 20 | 20 | 20 | 125 | 19 | 20 | 20 | JCC*200... |
| JCCWSR/L2525K2 | 2 | 20 | 25 | 25 | 125 | 19 | 25 | 25 | JCC*200... |

*øDmax*: Max. parting off dia.

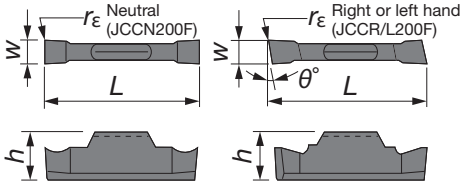
## SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| JCCWSR/L... | CSTB-4S | T-15F |



## APPLICABLE INSERT

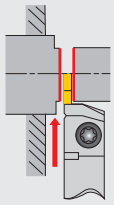
### JCC-type (sharp edge)



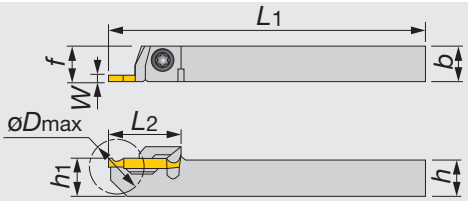

Right hand (R) shown.

| Designation | W±0.025 | rε | Coating J740 R | Coating J740 L | Uncoated TH10 R | Uncoated TH10 L | h | L | θ° |
|---|---|---|---|---|---|---|---|---|---|
| JCCN200F | 2 | 0 | ● | | ● | | 4.8 | 15 | 0 |
| JCCN200F-005 | 2 | 0.05 | ● | | | | 4.8 | 15 | 0 |
| JCCR/L200F | 2 | 0 | ● | ● | ● | ● | 4.8 | 15 | 15 |
| JCCR/L200F-005 | 2 | 0.05 | ● | ● | | | 4.8 | 15 | 15 |

● : Line-up



(Two corners type)




Right hand (R) shown.

| Designation | W | øDmax | h | b | L1 | L2 | h1 | f | Insert |
|---|---|---|---|---|---|---|---|---|---|
| JCGWSR/L1010K2 | 2 | 20 | 10 | 10 | 125 | 20 | 10 | 10 | JCGN200F... |
| JCGWSR/L1212K2 | 2 | 20 | 12 | 12 | 125 | 20 | 12 | 12 | JCGN200F... |
| JCGWSR/L1616K2 | 2 | 20 | 16 | 16 | 125 | 20 | 16 | 16 | JCGN200F... |

*øDmax*: Max. parting off dia.

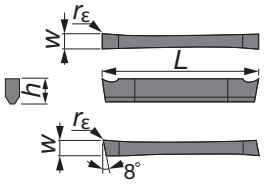
**SPARE PARTS**




| Designation | Clamping screw | Wrench |
|---|---|---|
| JCGWSR/L... | CSTB-4S | T-15F |

## APPLICABLE INSERT

### JCG-type (sharp edge)



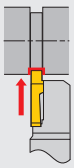

Right hand (R) shown.

| Designation | W±0.025 | rε | Coating J740 R | Coating J740 L | Uncoated TH10 R | Uncoated TH10 L | h | L |
|---|---|---|---|---|---|---|---|---|
| JCGN200F | 2 | 0.05 | ● | | ● | | 3 | 20 |
| JCGN200FR/L | 2 | 0.05 | ● | ● | ● | ● | 3 | 20 |

● : Line-up

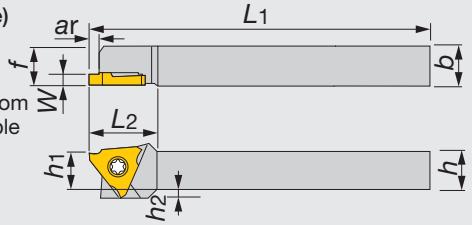
## JSTGR/L

External grooving toolholders for swiss lathes



(Three corners type)

Can be wrenched from back side with double socket torx screw.




Right hand (R) shown.

| Designation | W | ar | h | b | L1 | L2 | h1 | f | h2 | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| JSTGR/L1010X3 | 0.33 - 3 | 0.7 - 2.6 | 10 | 10 | 120 | 18.5 | 10 | 10 | 2 | JTGR/L3... |
| JSTGR/L1212F3 | 0.33 - 3 | 0.7 - 2.6 | 12 | 12 | 85 | 18.5 | 12 | 12 | - | JTGR/L3... |
| JSTGR/L1212X3 | 0.33 - 3 | 0.7 - 2.6 | 12 | 12 | 120 | 18.5 | 12 | 12 | - | JTGR/L3... |
| JSTGR/L1616X3 | 0.33 - 3 | 0.7 - 2.6 | 16 | 16 | 120 | 18.5 | 16 | 16 | - | JTGR/L3... |
| JSTGL1616K3 | 0.33 - 3 | 0.7 - 2.6 | 16 | 16 | 125 | 18.5 | 16 | 16 | - | JTGR/L3... |

• Recommend clamping torque: 1.2 N·m.

### SPARE PARTS

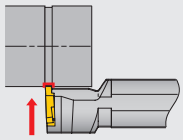
| Designation | Clamping screw | Wrench |
|---|---|---|
| JSTGR/L... | CSTB-4SD | T-8F |

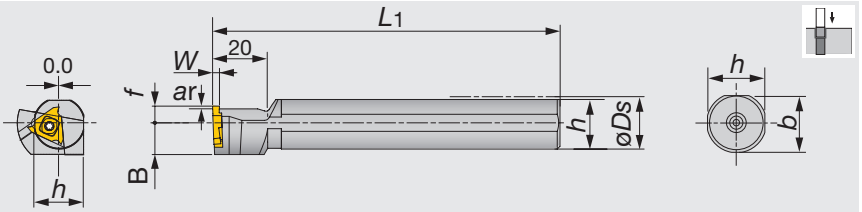




## JS-TGL3

External grooving toolholders for swiss lathe, perpendicularly mounted inserts






Left hand (L) shown.

| Designation | W | ar | øDs | f | L1 | h | b | B | Insert |
|---|---|---|---|---|---|---|---|---|---|
| JS19K-TGL3 | 0.33 - 3 | 0.7 - 2.6 | 19.05 | 6 | 125 | 18 | 18 | 11.5 | JTGR3... |
| JS20K-TGL3 | 0.33 - 3 | 0.7 - 2.6 | 20 | 6 | 125 | 19 | 19 | 11.5 | JTGR3... |
| JS22K-TGL3 | 0.33 - 3 | 0.7 - 2.6 | 22 | 6 | 125 | 21 | 21 | 11.5 | JTGR3... |
| JS25K-TGL3 | 0.33 - 3 | 0.7 - 2.6 | 25.4 | 10 | 125 | 24 | 24 | 12.7 | JTGR3... |

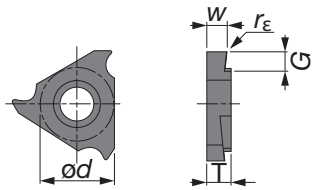
• Left hand toolholders (TGL3) are used with right hand inserts (JTGR3). • Recommend clamping torque: 3.0 Nm-ft.

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| JS***-TGL3 | CSTB-4S | T-15F |

## APPLICABLE INSERT

### JTG-type (sharp edge)




Right hand (R) shown.

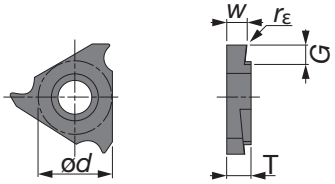
| Designation | W +0.05 0 | rε | Coating | | | | Cermet | | Uncoated | | ød | T | G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | SH725 | | J740 | | NS9530 | | TH10 | | | | |
| | | | R | L | R | L | R | L | R | L | | | |
| JTGR/L3033F | 0.33 | 0.03 | ● | | ● | ● | | | ● | ● | 9.525 | 3.18 | 0.7 |
| JTGR/L3033F-005 | 0.33 | 0.05 | ● | | | | | | | | 9.525 | 3.18 | 0.7 |
| JTGR/L3043F | 0.43 | 0.03 | | | ● | | | | | | 9.525 | 3.18 | 1.1 |
| JTGR/L3050F | 0.5 | 0.03 | ● | ● | ● | ● | ● | | ● | ● | 9.525 | 3.18 | 1.1 |
| JTGR/L3050F-005 | 0.5 | 0.05 | ● | ● | | | | | | | 9.525 | 3.18 | 1.1 |
| JTGR/L3065F | 0.65 | 0.03 | ● | | ● | | | | | | 9.525 | 3.18 | 1.9 |
| JTGR/L3065F-010 | 0.65 | 0.1 | ● | | | | | | | | 9.525 | 3.18 | 1.9 |
| JTGR/L3075F | 0.75 | 0.03 | ● | ● | ● | ● | ● | ● | ● | ● | 9.525 | 3.18 | 1.9 |
| JTGR/L3075F-010 | 0.75 | 0.1 | ● | ● | | | | | | | 9.525 | 3.18 | 1.9 |
| JTGR/L3080F | 0.8 | 0.03 | ● | | ● | | | | | | 9.525 | 3.18 | 1.9 |
| JTGR/L3080F-010 | 0.8 | 0.1 | ● | | | | | | | | 9.525 | 3.18 | 1.9 |
| JTGR/L3085F | 0.85 | 0.03 | ● | | ● | | | | | | 9.525 | 3.18 | 1.9 |
| JTGR/L3095F | 0.95 | 0.03 | ● | ● | ● | ● | ● | | ● | ● | 9.525 | 3.18 | 1.9 |
| JTGR/L3095F-010 | 0.95 | 0.1 | ● | ● | | | | | | | 9.525 | 3.18 | 1.9 |
| JTGR/L3100F | 1 | 0.05 | ● | ● | ● | ● | ● | | ● | ● | 9.525 | 3.18 | 2.1 |
| JTGR/L3100F-010 | 1 | 0.1 | ● | ● | | | | | | | 9.525 | 3.18 | 2.1 |
| JTGR/L3110F | 1.1 | 0.05 | ● | | ● | | | | | | 9.525 | 3.18 | 2.1 |
| JTGR/L3120F | 1.2 | 0.05 | ● | | ● | | | | | | 9.525 | 3.18 | 2.1 |
| JTGR/L3120F-010 | 1.2 | 0.1 | ● | | | | | | | | 9.525 | 3.18 | 2.1 |
| JTGR/L3125F | 1.25 | 0.05 | ● | ● | ● | ● | ● | | ● | ● | 9.525 | 3.18 | 2.1 |
| JTGR/L3125F-010 | 1.25 | 0.1 | ● | ● | | | | | | | 9.525 | 3.18 | 2.1 |
| JTGR/L3130F | 1.3 | 0.05 | ● | | ● | | | | | | 9.525 | 3.18 | 2.1 |
| JTGR/L3140F | 1.4 | 0.05 | ● | | ● | | | | | | 9.525 | 3.18 | 2.1 |
| JTGR/L3140F-010 | 1.4 | 0.1 | ● | | | | | | | | 9.525 | 3.18 | 2.1 |
| JTGR/L3145F | 1.45 | 0.05 | ● | | ● | ● | ● | | ● | ● | 9.525 | 3.18 | 2.1 |
| JTGR/L3145F-010 | 1.45 | 0.1 | ● | | | | | | | | 9.525 | 3.18 | 2.1 |
| JTGR/L3150F | 1.5 | 0.05 | ● | ● | ● | ● | ● | | ● | ● | 9.525 | 3.18 | 2.1 |
| JTGR/L3150F-010 | 1.5 | 0.1 | ● | ● | | | | | | | 9.525 | 3.18 | 2.1 |
| JTGR/L3175F | 1.75 | 0.05 | ● | | ● | ● | ● | ● | ● | ● | 9.525 | 3.18 | 2.1 |
| JTGR/L3175F-010 | 1.75 | 0.1 | ● | | | | | | | | 9.525 | 3.18 | 2.1 |
| JTGR/L3180F | 1.8 | 0.05 | ● | | ● | | | | | | 9.525 | 3.18 | 2.1 |
| JTGR/L3200F | 2 | 0.05 | ● | ● | ● | ● | ● | | ● | ● | 9.525 | 3.18 | 2.6 |
| JTGR/L3200F-010 | 2 | 0.1 | ● | ● | | | | | | | 9.525 | 3.18 | 2.6 |
| JTGR/L3225F | 2.25 | 0.05 | ● | | ● | | | | | | 9.525 | 3.18 | 2.6 |
| JTGR/L3250F | 2.5 | 0.05 | ● | ● | ● | ● | ● | | ● | ● | 9.525 | 3.18 | 2.6 |
| JTGR/L3250F-010 | 2.5 | 0.1 | ● | ● | | | | | | | 9.525 | 3.18 | 2.6 |
| JTGR/L3275F | 2.75 | 0.05 | | | ● | | | | | | 9.525 | 3.18 | 2.6 |
| JTGR/L3300F | 3 | 0.05 | ● | | ● | | | | | | 9.525 | 3.18 | 2.6 |
| JTGR/L3300F-010 | 3 | 0.1 | ● | | | | | | | | 9.525 | 3.18 | 2.6 |



● : Line-up

## APPLICABLE INSERT

### JTG-type (with honed edge)




Right hand (R) shown.

| Designation | $W^{+0.05}_{0}$ | rε | J9530 | | ød | T | G |
|---|---|---|---|---|---|---|---|
| | | | R | L | | | |
| JTGR/L3100 | 1 | 0.05 | ● | | 9.525 | 3.18 | 2.1 |
| JTGR/L3125 | 1.25 | 0.05 | ● | | 9.525 | 3.18 | 2.1 |
| JTGR/L3150 | 1.5 | 0.05 | ● | | 9.525 | 3.18 | 2.1 |
| JTGR/L3200 | 2 | 0.05 | ● | | 9.525 | 3.18 | 2.6 |

● : Line-up



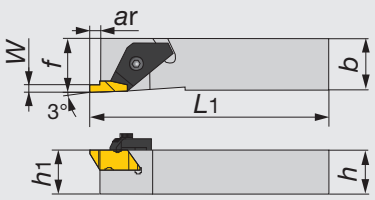
## STANDARD CUTTING CONDITIONS FOR J SERIES GROOVING TOOLS

| ISO | Workpiece material | Grade | Cutting speed *Vc* (m/min) | Feed *f* (mm/rev) |
|---|---|---|---|---|
| P | General steels, Free-cutting steels, etc. | J740 | 10 - 100 | 0.01 - 0.1 |
| | | SH725 | 50 - 150 | 0.01 - 0.1 |
| | | NS9530 | 50 - 150 | 0.01 - 0.1 |
| | | J9530 | 50 - 150 | 0.01 - 0.1 |
| M | Stainless steels, etc. | J740 | 10 - 100 | 0.01 - 0.1 |
| | | SH725 | 50 - 150 | 0.01 - 0.1 |
| N | Aluminium alloys, copper alloys, etc. | TH10 | 10 - 200 | 0.01 - 0.1 |
| S | Difficult-to-cut materials, titanium alloys, etc. | TH10 | 10 - 30 | 0.01 - 0.1 |

# TUNGT-CLAMP

## FLASR/L

External grooving & threading toolholders for swiss lathes




Right hand (R) shown.

| Designation | W | $a_r$ | $h_1$ | h | b | $L_1$ | f | Insert |
|---|---|---|---|---|---|---|---|---|
| FLASR/L-1616M3 | 1 - 3 | 4.81 | 16 | 16 | 16 | 125 | 16 | FL*-3**R/L... |

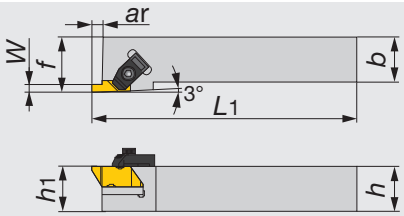
### SPARE PARTS

| Designation | Clamp | Clamping screw | Wrench |
|---|---|---|---|
| FLASR-1616M3 | TF-184 | S-412 | 5/32HEX |
| FLASL-1616M3 | TF-185 | S-412 | 5/32HEX |

# TUNGT-CLAMP

## FLSR/L

External toolholders for grooving & threading




Right hand (R) shown.

| Designation | W | $a_r$ | $h_1$ | h | b | $L_1$ | f | Insert |
|---|---|---|---|---|---|---|---|---|
| FLSR/L-2020M3 | 1 - 3 | 4.5 | 20 | 20 | 20 | 125 | 32 | FL*-3**R/L... |
| FLSR/L-2525M3 | 1 - 3 | 4.5 | 25 | 25 | 25 | 150 | 32 | FL*-3**R/L... |

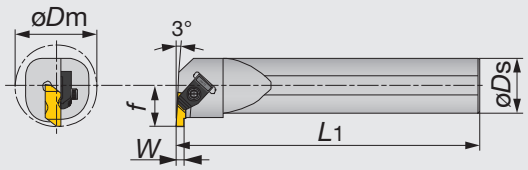
### SPARE PARTS

| Designation | Clamp | Clamping screw | Wrench |
|---|---|---|---|
| FLSR-****M3 | TF-72 | S-412 | 5/32HEX |
| FLSL-****M3 | TF-73 | S-412 | 5/32HEX |

# TUNGT-CLAMP

## A_M-FLER/L

Internal toolholders for grooving & threading




Right hand (R) shown.

| Designation | W | øDm | øDs | L1 | f | Insert |
|---|---|---|---|---|---|---|
| A25M-FLER/L3 | 1 - 3 | 34.9 | 25 | 300 | 17.7 | FL*-3**L/R... |
| A32M-FLER/L3 | 1 - 3 | 44.5 | 32 | 350 | 22.1 | FL*-3**L/R... |
| A40M-FLER3 | 1 - 3 | 50.8 | 40 | 350 | 24.5 | FL*-3**L... |

### SPARE PARTS

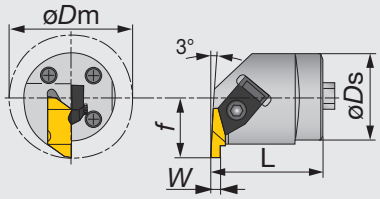
| Designation | Clamp | Clamping screw | Wrench |
|---|---|---|---|
| A**M-FLER3 | TF-73 | S-412 | 5/32HEX |
| A**M-FLEL3 | TF-72 | S-412 | 5/32HEX |



# TUNGT-CLAMP

## HS-FLER/L

Exchangeable heads for internal grooving & threading, applicable on S-570 shanks




Right hand (R) shown.

| Designation | W | øDm | øDs | L | f | Insert |
|---|---|---|---|---|---|---|
| HS40-FLER3W | 1 - 3 | 56.1 | 40 | 40.1 | 28 | FL*-3**L... |
| HS50-FLER3W | 1 - 3 | 70.1 | 50 | 41.9 | 35 | FL*-3**L... |

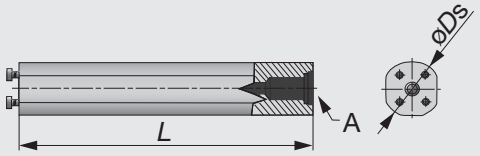
### SPARE PARTS

| Designation | Clamp | Clamping screw | Wrench |
|---|---|---|---|
| HS40-FLER3W | TF-73 | S-412 | 5/32HEX |
| HS50-FLER3W | TF-73 | S-412 | 5/32HEX |

# TUNGT-CLAMP

## S-570

Steel shanks for exchangeable head




| Designation | øDs | L | A |
|---|---|---|---|
| S-570-40M-40 | 40 | 273 | 1/2-14NPT |
| S-570-50M-50 | 50 | 366 | 1/2-14NPT |

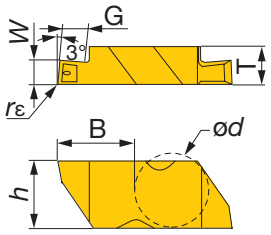
### SPARE PARTS




| Designation | Clamping screw | Wrench |
|---|---|---|
| S-570-40M-40 | SS100 | 5/32HEX |
| S-570-50M-50 | SS94 | 1/4HEX |

## INSERT

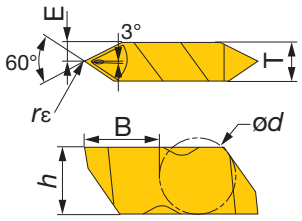
### FLG-CB (For grooving)




| Designation | W±0.025 | rε | AH110 | | G | ød | T | h | B |
|---|---|---|---|---|---|---|---|---|---|
| | | | R | L | | | | | |
| FLG-3M100R/L-CB | 1 | 0.13 - 0.25 | ● | ● | 1.4 | 9.525 | 4.95 | 8.74 | 10.29 |
| FLG-3M150R/L-CB | 1.5 | 0.13 - 0.25 | ● | ● | 2.55 | 9.525 | 4.95 | 8.74 | 10.29 |
| FLG-3M200R/L-CB | 2 | 0.13 - 0.25 | ● | ● | 2.55 | 9.525 | 4.95 | 8.74 | 10.29 |
| FLG-3M250R/L-CB | 2.5 | 0.13 - 0.25 | ● | ● | 4.07 | 9.525 | 4.95 | 8.74 | 10.29 |
| FLG-3M300R/L-CB | 3 | 0.13 - 0.25 | ● | ● | 4.07 | 9.525 | 4.95 | 8.74 | 10.29 |

● : Line-up

### FLT-CB (For threading)




| Designation | rε | AH725 | | Pitch | | ød | E | T | h | B |
|---|---|---|---|---|---|---|---|---|---|---|
| | | R | L | Internal | External | | | | | |
| FLT-3R/L-HCB | 0.13 - 0.2 | ● | ● | 2.11 - 5.08 | 1.27 - 4.23 | 9.525 | 2.49 | 4.95 | 8.74 | 10.16 |
| FLT-3R/LC-HCB | 0.31 - 0.38 | ● | ● | 4.23 - 5.08 | 2.31 - 4.23 | 9.525 | 2.49 | 4.95 | 8.74 | 10.16 |
| FLT-3R/L-CB | 0.13 - 0.2 | ● | ● | 2.11 - 3.175 | 1.27 - 3.175 | 9.525 | 2.49 | 4.95 | 8.74 | 10.16 |

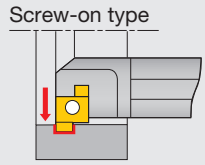
● : Line-up

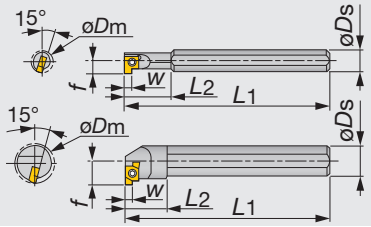
## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Grade | Application | Cutting speed *Vc* (m/min) | Feed *f* (mm/rev) |
|---|---|---|---|---|---|
| P | High carbon steel C45, etc. | AH110 | Grooving | 100 - 200 | 0.12 - 0.35 |
| | | AH725 | Threading | 80 - 180 | - |
| | Alloy steel 34CrMo4, etc. | AH110 | Grooving | 50 - 80 | 0.12 - 0.3 |
| | | AH725 | Threading | 60 - 160 | - |
| M | Stainless steel X5CrNi18-9, etc. | AH110 | Grooving | 50 - 150 | 0.1 - 0.2 |
| | | AH725 | Threading | 50 - 130 | - |
| K | Gray cast iron 250, etc. | AH110 | Grooving | 50 - 180 | 0.1 - 0.25 |
| | | AH725 | Threading | - | - |
| | Ductile cast iron 400-15S, etc. | AH110 | Grooving | 50 - 120 | 0.1 - 0.25 |
| | | AH725 | Threading | - | - |

## SNGR/L

Toolholders for internal grooving







Applicable inserts
6GR/L
7GR/L




Applicable inserts
8GR/L
9GR/L

Right hand (R) shown.

| Designation | Material | W | øDm | ar | øDs | f | L1 | L2 | h | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| SNGR/L08H06 | STEEL | 1 - 2 | 8 | 1.5 | 8 | 4.7 | 100 | 18 | 7 | 6GR/L... |
| SNGR/L08H07 | STEEL | 1 - 2 | 10 | 1.5 | 8 | 5.8 | 100 | 23 | 7 | 7GR/L... |
| SNGR/L10K07 | STEEL | 1 - 2 | 12 | 1.5 | 10 | 6.8 | 125 | 29 | 9 | 7GR/L... |
| SNGR/L10K08 | STEEL | 1.5 - 3.5 | 14 | 2 | 10 | 7.6 | 125 | 15 | 9 | 8GR/L... |
| SNGR/L12M08 | STEEL | 1.5 - 3.5 | 16 | 2 | 12 | 8.6 | 150 | 18 | 11 | 8GR/L... |
| SNGR/L16Q09 | STEEL | 1.5 - 3.5 | 20 | 3 | 16 | 11.6 | 180 | 20 | 15 | 9GR/L... |
| SNGR/L20R09 | STEEL | 1.5 - 3.5 | 24 | 3 | 20 | 13.6 | 200 | 25 | 18 | 9GR/L... |
| SNGR/L08K06SC | CARBIDE | 1.5 - 3.5 | 8 | 1.5 | 8 | 4.7 | 125 | 28 | 7 | 6GR/L... |
| SNGR/L08K07SC | CARBIDE | 1.5 - 3.5 | 10 | 1.5 | 8 | 5.8 | 125 | 35 | 7 | 7GR/L... |
| SNGR/L10M07SC | CARBIDE | 1.5 - 3.5 | 12 | 1.5 | 10 | 6.8 | 150 | 45 | 9 | 7GR/L... |
| SNGR/L10M08SC | CARBIDE | 1.5 - 3.5 | 14 | 2 | 10 | 7.6 | 150 | 45 | 9 | 8GR/L... |
| SNGR/L12Q08SC | CARBIDE | 1.5 - 3.5 | 16 | 2 | 12 | 8.6 | 180 | - | 11 | 8GR/L... |
| SNGR/L16R09SC | CARBIDE | 1.5 - 3.5 | 20 | 3 | 16 | 11.6 | 200 | - | 15 | 9GR/L... |

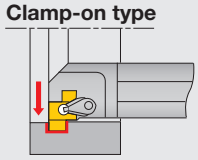
### SPARE PARTS

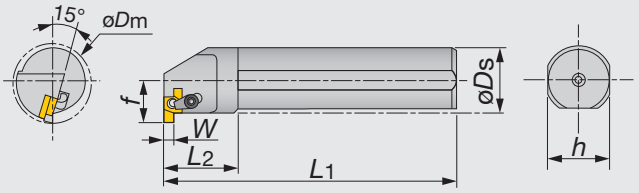




| Designation | Clamping screw | Wrench |
|---|---|---|
| SNGR/L***06 | CSTB-2L040 | T-6F |
| SNGR/L***07 | CSTB-2.2S | T-7F |
| SNGR/L***08 | CSTB-2.2 | T-7F |
| SNGR/L***09 | CSTB-2.5L080 | T-8F |
| SNGR/L***06SC | CSTB-2L040 | T-6F |
| SNGR/L***07SC | CSTB-2.2S | T-7F |
| SNGR/L***08SC | CSTB-2.2 | T-7F |
| SNGR/L***09SC | CSTB-2.5L080 | T-8F |

Clamp-on type






Right hand (R) shown.

| Designation | W | øDm | ar | øDs | f | L1 | L2 | h | Insert |
|---|---|---|---|---|---|---|---|---|---|
| CNGR/L25S15 | 2 - 5 | 32 | 5 | 25 | 18.1 | 250 | 30 | 23 | 15GR/L... |
| CNGR/L32T15 | 2 - 5 | 40 | 5 | 32 | 22.1 | 300 | 35 | 30 | 15GR/L... |
| CNGR/L40U15 | 2 - 5 | 48 | 5 | 40 | 26.1 | 350 | 45 | 38 | 15GR/L... |

## SPARE PARTS

| Designation | Clamp set | Screw | Shim | Wrench |
|---|---|---|---|---|
| CNGR... | CSP22 | DTS5-3.5 | SGSR151 | T-20F |
| CNGL... | CSP22 | DTS5-3.5 | SGSL151 | T-20F |

## Optional parts for CNG type toolholders

When using as a screw-on type, use the following parts.

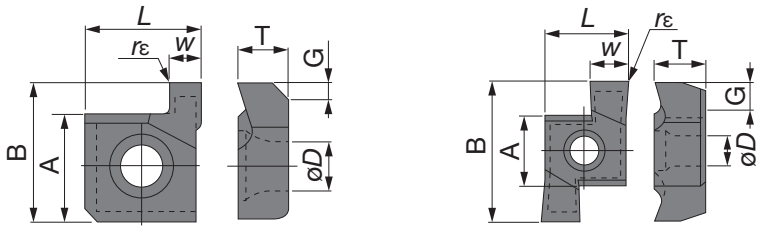


| Designation | Clamping screw | Wrench |
|---|---|---|
| CNGR/L... | CSTB-3.5L | T-15F |

Grooving Tool

## INSERT

### **GR/L




Right hand (R) shown.

| Designation | W±0.025 | rε | Cermet NS9530 R | Cermet NS9530 L | Uncoated TH10 R | Uncoated TH10 L | Uncoated UX30 R | Uncoated UX30 L | A | B | T | øD | L | G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6GR/L100 | 1 | 0.2 | ● | | ● | | ● | ● | 4.76 | 6.44 | 2.34 | 2.3 | 5.56 | 1.5 |
| 6GR/L150 | 1.5 | 0.2 | ● | | ● | ● | ● | ● | 4.76 | 6.44 | 2.34 | 2.3 | 5.56 | 1.5 |
| 6GR/L200 | 2 | 0.2 | ● | | ● | ● | ● | ● | 4.76 | 6.44 | 2.34 | 2.3 | 5.56 | 1.5 |
| 7GR/L100 | 1 | 0.2 | ● | | ● | | ● | | 5.56 | 7.36 | 3.08 | 2.58 | 5.56 | 1.5 |
| 7GR/L150 | 1.5 | 0.2 | ● | | ● | | ● | | 5.56 | 7.36 | 3.08 | 2.58 | 5.56 | 1.5 |
| 7GR/L200 | 2 | 0.2 | ● | | ● | ● | ● | ● | 5.56 | 7.36 | 3.08 | 2.58 | 5.56 | 1.5 |
| 8GR/L150 | 1.5 | 0.2 | ● | | ● | | ● | | 5.56 | 10.16 | 3.87 | 2.58 | 6.15 | 2 |
| 8GR/L200 | 2 | 0.2 | ● | | ● | ● | ● | | 5.56 | 10.16 | 3.87 | 2.58 | 6.15 | 2 |
| 8GR/L250 | 2.5 | 0.2 | ● | | ● | ● | ● | ● | 5.56 | 10.16 | 3.87 | 2.58 | 6.15 | 2 |
| 8GR/L300 | 3 | 0.2 | ● | | ● | ● | ● | ● | 5.56 | 10.16 | 3.87 | 2.58 | 6.15 | 2 |
| 8GR/L350 | 3.5 | 0.2 | | | ● | | ● | | 5.56 | 10.16 | 3.87 | 2.58 | 6.15 | 2 |
| 9GR/L150 | 1.5 | 0.2 | ● | ● | ● | | ● | ● | 6.35 | 12.95 | 4.66 | 2.86 | 7.74 | 2 |
| 9GR/L200 | 2 | 0.2 | ● | ● | ● | ● | ● | ● | 6.35 | 12.95 | 4.66 | 2.86 | 7.74 | 3 |
| 9GR/L250 | 2.5 | 0.2 | ● | ● | ● | | ● | ● | 6.35 | 12.95 | 4.66 | 2.86 | 7.74 | 3 |
| 9GR/L300 | 3 | 0.2 | ● | ● | ● | ● | ● | ● | 6.35 | 12.95 | 4.66 | 2.86 | 7.74 | 3 |
| 9GR/L350 | 3.5 | 0.2 | ● | ● | ● | | ● | ● | 6.35 | 12.95 | 4.66 | 2.86 | 7.74 | 3 |
| 15GR/L200 | 2 | 0.2 | ● | | ● | | ● | | 9.2 | 20.8 | 5.1 | 4.8 | 10.8 | 3 |
| 15GR/L250 | 2.5 | 0.2 | ● | | ● | | ● | | 9.2 | 20.8 | 5.1 | 4.8 | 10.8 | 3 |
| 15GR/L300 | 3 | 0.2 | ● | | ● | | ● | ● | 9.2 | 20.8 | 5.1 | 4.8 | 10.8 | 3 |
| 15GR/L350 | 3.5 | 0.2 | ● | | ● | | ● | | 9.2 | 20.8 | 5.1 | 4.8 | 10.8 | 3 |
| 15GR/L400 | 4 | 0.2 | ● | | ● | | ● | | 9.2 | 20.8 | 5.1 | 4.8 | 10.8 | 4 |
| 15GR/L450 | 4.5 | 0.2 | | | ● | ● | ● | | 9.2 | 20.8 | 5.1 | 4.8 | 10.8 | 4 |
| 15GR/L500 | 5 | 0.2 | | | ● | | ● | | 9.2 | 20.8 | 5.1 | 4.8 | 10.8 | 5 |

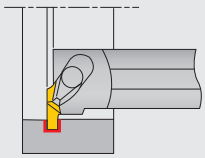
Note:
When using a right or left hand insert, the right hand insert is used with right hand toolholder and the left hand insert is used with left hand toolholder.

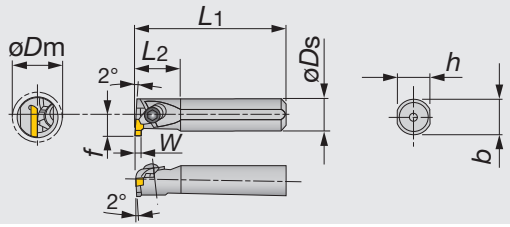
● : Line-up

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Cutting speed *Vc* (m/min) | Feed *f* (mm/rev) |
|---|---|---|---|
| P | Medium carbon steels | 40 - 150 | 0.05 - 0.15 |
| K | Cast irons, Light alloys | 60 - 200 | 0.05 - 0.15 |

Notes:
- Cutting conditions shown above are a guideline only.
- When grooving close to the minimum bore diameter or with long reach conditions, reduce the conditions shown above by approximately 50%.
- To help chip evacuation, use water-soluble cutting fluid. The fluid should be applied sufficiently to the cutting point.
- When using without cutting fluid, reduce both the cutting speeds and feeds shown on the above by 50% at least.






Right hand (R) shown.

| Designation | Material | W | øDm | ar | øDs | f | L1 | L2 | h | b | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CGXR/L0016 | STEEL | 1 - 3 | 20 | 3 | 16 | 11.3 | 150 | 24 | 15 | 15.5 | GIR/L52... |
| CGXR/L0020 | STEEL | 1 - 3 | 24 | 3 | 20 | 13.3 | 180 | 30 | 18 | 19 | GIR/L52... |
| CGXR/L0025 | STEEL | 1 - 5 | 32 | 5.3 | 25 | 18 | 200 | 38 | 23 | 24 | GIR/L63... |
| CGXR/L0032 | STEEL | 1 - 5 | 40 | 5.3 | 32 | 23 | 250 | 48 | 30 | 31 | GIR/L63... |
| CGXR/L0040 | STEEL | 1 - 5 | 48 | 5.3 | 40 | 27 | 300 | 60 | 37 | 38.5 | GIR/L63... |
| CGXR/L16SC | CARBIDE | 1 - 3 | 20 | 3 | 16 | 11.3 | 200 | 24 | 15 | - | GIR/L52... |

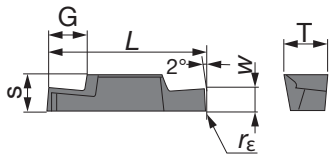
• When using a right or left hand insert, the right hand insert (GIR) is used for the right hand toolholders (CGXR) , and the left hand insert (GIL) is used for the left hand toolholders (CGXL).

## SPARE PARTS

| Designation | Clamp set | Wrench 1 | Wrench 2 |
|---|---|---|---|
| CGXR/L0016/20 | CSW-0 | - | P-2.5T |
| CGXR/L0025/32/40 | CSW-2 | P-4 | - |
| CGXR/L16SC | CSW-0 | - | P-2.5T |

## INSERT

### GIR/L




Right hand (R) shown.

| Designation | W±0.05 | $r_\varepsilon$ | Cermet NS9530 | | Uncoated TH10 | | S | T | L | G |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | R | L | R | L | | | | |
| GIR/L5210-02 | 1 | 0.2 | ● | ● | ● | ● | 3.5 | 4.4 | 15 | 1.5 |
| GIR/L5215-02 | 1.5 | 0.2 | ● | ● | ● | ● | 3.5 | 4.4 | 15 | 2.3 |
| GIR/L5220-02 | 2 | 0.2 | ● | ● | ● | ● | 3.5 | 4.4 | 15 | 3 |
| GIR/L5225-02 | 2.5 | 0.2 | ● | | ● | ● | 3.5 | 4.4 | 15 | 3 |
| GIR/L5230-02 | 3 | 0.2 | ● | | ● | ● | 3.5 | 4.4 | 15 | 3 |
| GIR/L6310-02 | 1 | 0.2 | ● | | ● | ● | 5.5 | 6.4 | 24 | 1.5 |
| GIR/L6315-02 | 1.5 | 0.2 | ● | ● | ● | ● | 5.5 | 6.4 | 24 | 2.3 |
| GIR/L6320-02 | 2 | 0.2 | ● | ● | ● | ● | 5.5 | 6.4 | 24 | 3 |
| GIR/L6325-02 | 2.5 | 0.2 | ● | ● | ● | ● | 5.5 | 6.4 | 24 | 3.8 |
| GIR/L6330-02 | 3 | 0.2 | ● | ● | ● | ● | 5.5 | 6.4 | 24 | 4.5 |
| GIR/L6335-02 | 3.5 | 0.2 | ● | ● | ● | ● | 5.5 | 6.4 | 24 | 5.3 |
| GIR/L6340-02 | 4.0 | 0.2 | ● | ● | ● | ● | 5.5 | 6.4 | 24 | 5.3 |
| GIR/L6345-02 | 4.5 | 0.2 | ● | | ● | ● | 5.5 | 6.4 | 24 | 5.3 |
| GIR/L6350-02 | 5 | 0.2 | ● | | ● | ● | 5.5 | 6.4 | 24 | 5.3 |

● : Line-up

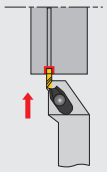
Note:
When using a right or left hand insert, the right hand insert is used with right hand toolholder and the left hand insert is used with left hand toolholder.

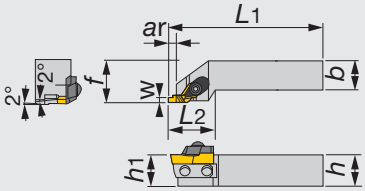
## STANDARD CUTTING CONDITIONS (EXTERNAL & INTERNAL GROOVING)

| ISO | Workpiece material | Grade | Cutting speed Vc (m/min) | Feed f (mm/rev) | | |
|---|---|---|---|---|---|---|
| | | | | W < 2 mm | W = 2 ~ 4 mm | W > 4 mm |
| P | Carbon steels | NS9530 | 80 - 150 | 0.05 - 0.1 | 0.08 - 0.15 | 0.08 - 0.2 |
| K | Cast irons, Light alloys | TH10 | 60 - 150 | 0.05 - 0.1 | 0.08 - 0.15 | 0.08 - 0.2 |

## GX-R/LE

External toolholders for grooving, with double-ended inserts






Right hand (R) shown.

| Designation | W | ar | h | b | L1 | L2 | h1 | f | Insert |
|---|---|---|---|---|---|---|---|---|---|
| GX-2020R/LE | 1 - 4.5 | 1.5 - 6 | 20 | 20 | 125 | 35 | 20 | 25 | XGR/L63... |
| GX-2525R/LE | 1 - 4.5 | 1.5 - 6 | 25 | 25 | 150 | 35 | 25 | 32 | XGR/L63... |

• When using a right or left hand insert, the right hand insert (XGR) is used for the right hand toolholders (GX-****RE) , and the left hand insert (XGL) is used for the left hand toolholders (GX-****LE).

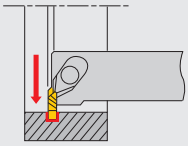
### SPARE PARTS

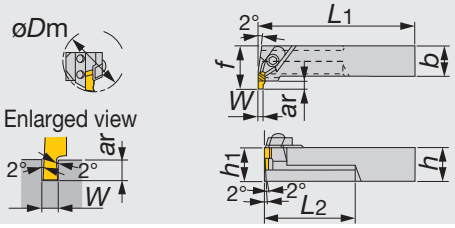
| Designation | Clamp | Clamp screw | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|
| GX-2020RE | CP81A | RT-1 | SL-6R | BHM4-8 | P-4 |
| GX-2020LE | CP81A | RT-1 | SL-6L | BHM4-8 | P-4 |
| GX-2525RE | CP81A | RT-1 | SL-1R | BHM4-8 | P-4 |
| GX-2525LE | CP81A | RT-1 | SL-1L | BHM4-8 | P-4 |

Note:
Max.groove width and max. groove depth shown in the above table are the values when the insert having the largest cutting edge width is used.

## GX-R/LI

Toolholders for internal grooving






Right hand (R) shown.

| Designation | W | øDm | ar | h | b | L1 | L2 | h1 | f | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| GX-2525R/LI | 1 - 4.5 | 55 | 1.5 - 6 | 25 | 25 | 200 | 70 | 25 | 35 | XGL/R63... |

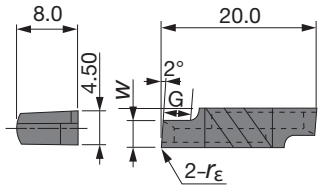
• When using a right or left hand insert, the right hand insert (XGR) is used for the left hand toolholders (GX-****LI) , and the left hand insert (XGL) is used for the right hand toolholders (GX-****RI).

### SPARE PARTS

| Designation | Clamp | Clamp screw | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|
| GX-2525RI | CP81B | RT-1 | SL-2R | BHM3-8 | P-4 |
| GX-2525LI | CP81B | RT-1 | SL-2L | BHM3-8 | P-4 |

# INSERT

## XGR/L



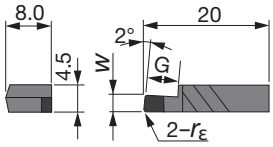

Right hand (R) shown.

| Designation | W±0.05 | rε | Cermet NS9530 R | Cermet NS9530 L | Uncoated TH10 R | Uncoated TH10 L | Uncoated UX30 R | Uncoated UX30 L | G |
|---|---|---|---|---|---|---|---|---|---|
| XGR/L6310-02 | 1 | 0.2 | ● | ● | ● | ● | ● | ● | 1.5 |
| XGR/L6315-02 | 1.5 | 0.2 | ● | ● | ● | ● | ● | ● | 2.3 |
| XGR/L6320-02 | 2 | 0.2 | ● | ● | ● | ● | ● | ● | 3 |
| XGR/L6325-02 | 2.5 | 0.2 | ● | ● | ● | ● | ● | ● | 3.8 |
| XGR/L6330-02 | 3 | 0.2 | ● | ● | ● | ● | ● | ● | 4.5 |
| XGR/L6335-02 | 3.5 | 0.2 | ● | ● | ● | ● | ● | ● | 5.3 |
| XGR/L6340-02 | 4 | 0.2 | ● | ● | ● | ● | ● | ● | 6 |
| XGR/L6345-02 | 4.5 | 0.2 | ● | ● | ● | ● | ● | ● | 6 |

● : Line-up

Note;
For internal machining, use right-hand toolholder (GX-****RI) with left-hand insert (XGL****), and use left-hand toolholder (GX-****LI) with right-hand insert (XGR****).
For external machining, use right-hand toolholder (GX-****RE) with right-hand insert (XGR****), and use left-hand toolholder (GX-****LE) with left-hand insert (XGL****).

## XGR/L-QBN




Right hand (R) shown.

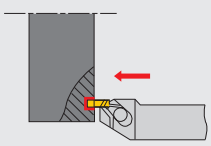
| Designation | W±0.05 | rε | T-CBN BX360 R | T-CBN BX360 L | G |
|---|---|---|---|---|---|
| XGR/L6315S-QBN | 1.5 | 0.2 | ● | | 2.3 |
| XGR/L6320S-QBN | 2 | 0.2 | ● | | 3 |
| XGR/L6325S-QBN | 2.5 | 0.2 | ● | | 3.8 |
| XGR/L6330S-QBN | 3 | 0.2 | ● | | 4.5 |
| XGR/L6335S-QBN | 3.5 | 0.2 | ● | | 5.3 |
| XGR/L6340S-QBN | 4 | 0.2 | ● | | 6 |
| XGR/L6345S-QBN | 4.5 | 0.2 | ● | | 6 |

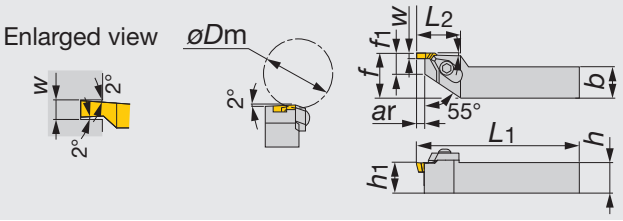
● : Line-up

Note;
For internal machining, use right-hand toolholder (GX-****RI) with left-hand insert (XGL****), and use left-hand toolholder (GX-****LI) with right-hand insert (XGR****).
For external machining, use right-hand toolholder (GX-****RE) with right-hand insert (XGR****), and use left-hand toolholder (GX-****LE) with left-hand insert (XGL****).

# STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Grade | Cutting speed $v_c$ (m/min) | Feed f (mm/rev) W < 2 mm | Feed f (mm/rev) W = 2 ~ 4 mm | Feed f (mm/rev) W > 4 mm |
|---|---|---|---|---|---|---|
| P | Carbon steels | NS9530 | 80 - 200 | 0.05 - 0.1 | 0.08 - 0.2 | 0.08 - 0.25 |
| | | TX10S | 60 - 150 | 0.05 - 0.1 | 0.08 - 0.2 | 0.08 - 0.25 |
| | | UX30 | 60 - 150 | 0.05 - 0.1 | 0.08 - 0.2 | 0.08 - 0.25 |
| K | Cast irons , Light alloys | TH10 | 60 - 150 | 0.05 - 0.1 | 0.08 - 0.2 | 0.08 - 0.25 |
| H | Hardened steels | BX360 | 50 - 180 | 0.05 - 0.15 | 0.05 - 0.15 | 0.05 - 0.15 |






Right hand (R) shown.

| Designation | W | øDm | ar | h | b | L1 | L2 | h1 | f | f1 | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| GX-2525R/LF | 1 - 4.5 | 55 | 1.5 - 6 | 25 | 25 | 150 | 35 | 25 | 32 | 15 | XNL/R63... |

• When using a right or left hand insert, the right hand insert (XNR) is used for the left hand toolholders (GX-...LF) , and the left hand insert (XNL) is used for the right hand toolholders (GX-...RF).

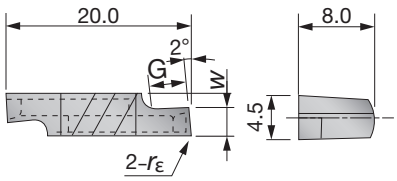
SPARE PARTS

| Designation | Clamp set | Clamping screw | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|
| GX-2525RF | CP81A | RT-1 | SL-3R | BHM4-8 | P-4 |
| GX-2525LF | CP81A | RT-1 | SL-3L | BHM4-8 | P-4 |



## INSERT

### XNR/L



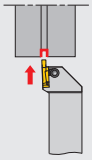

Left hand (L) shown.

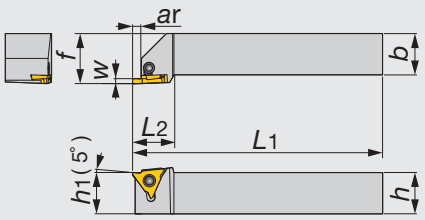
| Designation | W±0.05 | rε | Cermet NS9530 R | Cermet NS9530 L | Uncoated TH10 R | Uncoated TH10 L | G |
|---|---|---|---|---|---|---|---|
| XNR/L6310-02 | 1 | 0.2 | ● | ● | ● | ● | 1.5 |
| XNR/L6315-02 | 1.5 | 0.2 | ● | ● | ● | ● | 2.3 |
| XNR/L6320-02 | 2 | 0.2 | ● | ● | ● | ● | 3 |
| XNR/L6325-02 | 2.5 | 0.2 | ● | ● | ● | ● | 3.8 |
| XNR/L6330-02 | 3 | 0.2 | ● | ● | ● | ● | 4.5 |
| XNR/L6335-02 | 3.5 | 0.2 | ● | ● | ● | ● | 5.3 |
| XNR/L6340-02 | 4 | 0.2 | ● | ● | ● | ● | 6 |
| XNR/L6345-02 | 4.5 | 0.2 | ● | ● | ● | ● | 6 |

● : Line-up

## TGTSR/L

External toolholders for grooving, with triple corner insert






Right hand (R) shown.

| Designation | W | ar | h | b | $L_1$ | $L_2$ | $h_1$ | f |
|---|---|---|---|---|---|---|---|---|
| TGTSR/L2020K16 | 0.33 - 2.5 | 2.5 | 20 | 20 | 125 | 25 | 20 | 25 |
| TGTSR/L2525M16 | 0.33 - 2.5 | 2.5 | 25 | 25 | 150 | 25 | 25 | 30 |
| TGTSR/L2020K22-1 | 1 - 1.45 | 2 | 20 | 20 | 125 | 25 | 20 | 25 |
| TGTSR/L2020K22-2 | 1.5 - 2.3 | 3.5 | 20 | 20 | 125 | 25 | 20 | 25 |
| TGTSR/L2020K22-3 | 2.5 - 4.5 | 5 | 20 | 20 | 125 | 25 | 20 | 25 |
| TGTSR/L2525M22-1 | 1 - 1.45 | 2 | 25 | 25 | 150 | 25 | 25 | 30 |
| TGTSR/L2525M22-2 | 1.5 - 2.3 | 3.5 | 25 | 25 | 150 | 25 | 25 | 30 |
| TGTSR/L2525M22-3 | 2.5 - 4.5 | 5 | 25 | 25 | 150 | 25 | 25 | 30 |

• See Applicable insert table. • The right hand insert (GBR) is used for the right hand toolholders (TGTSR), and the left hand insert (GBL) is used for the left hand toolholders (TGTSL).

| Designation | Applicable insert |
|---|---|
| TGTSR/L2020K16 | GBR/L32... |
| TGTSR/L2525M16 | GBR/L32... |
| TGTSR/L2020K22-1 | GBR/L43125 ~ 145 GBR/L43050R |
| TGTSR/L2020K22-2 | GBR/L43150 ~ 230 GBR/L43075R ~ 100R |
| TGTSR/L2020K22-3 | GBR/L43250 ~ 450 GBR/L43125R ~ 200R |
| TGTSR/L2525M22-1 | GBR/L43125 ~ 145 GBR/L43050R |
| TGTSR/L2525M22-2 | GBR/L43150 ~ 230 GBR/L43075R ~ 100R |
| TGTSR/L2525M22-3 | GBR/L43250 ~ 450 GBR/L43125R ~ 200R |

### SPARE PARTS

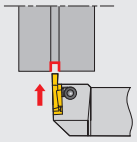


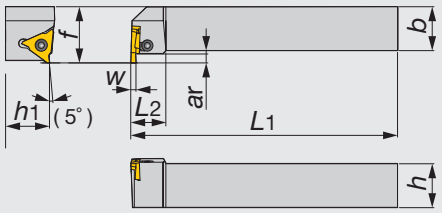


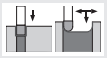
| Designation | Clamp | Clamping screw | Wrench |
|---|---|---|---|
| TGTSR/L*****16 | CP900 | MCS520-2.5 | P-2.5 |
| TGTSR/L*****22... | CP910 | MCS520-2.5 | P-2.5 |

## TGTTR/L

Perpendicular toolholders for external grooving, with triple corner inserts





Right hand (R) shown.

| Designation | W | ar | h | b | L1 | L2 | h1 | f |
|---|---|---|---|---|---|---|---|---|
| TGTTR/L2020K16 | 0.33 - 2.5 | 2.5 | 20 | 20 | 125 | 20 | 20 | 27 |
| TGTTR/L2525M16 | 0.33 - 2.5 | 2.5 | 25 | 25 | 150 | 20 | 25 | 32 |
| TGTTR/L2020K22-1 | 1 - 1.45 | 2 | 20 | 20 | 125 | 20 | 20 | 27 |
| TGTTR/L2020K22-2 | 1.5 - 2.3 | 3.5 | 20 | 20 | 125 | 20 | 20 | 27 |
| TGTTR/L2020K22-3 | 2.5 - 4.5 | 5 | 20 | 20 | 125 | 20 | 20 | 27 |
| TGTTR/L2525M22-1 | 1 - 2.3 | 2 | 25 | 25 | 150 | 20 | 25 | 32 |
| TGTTR/L2525M22-2 | 1.5 - 2.3 | 3.5 | 25 | 25 | 150 | 20 | 25 | 32 |
| TGTTR/L2525M22-3 | 2.5 - 4.5 | 5 | 25 | 25 | 150 | 20 | 25 | 32 |

• See Applicable insert table. • The left hand insert (GBL) is used for the right hand toolholders (TGTTR), and the right hand insert (GBR) is used for the left hand toolholders (TGTTL).

| Designation | Applicable insert |
|---|---|
| TGTTR/L2020K16 | GBL/R32... |
| TGTTR/L2525M16 | GBL/R32... |
| TGTTR/L2020K22-1 | GBL/R43125 ~ 145 GBL/R43050R |
| TGTTR/L2020K22-2 | GBL/R43150 ~ 230 GBL/R43075R ~ 100R |
| TGTTR/L2020K22-3 | GBL/R43250 ~ 450 GBL/R43125R ~ 200R |
| TGTTR/L2525M22-1 | GBL/R43125 ~ 145 GBL/R43050R |
| TGTTR/L2525M22-2 | GBL/R43150 ~ 230 GBL/R43075R ~ 100R |
| TGTTR/L2525M22-3 | GBL/R43250 ~ 450 GBL/R43125R ~ 200R |

### SPARE PARTS

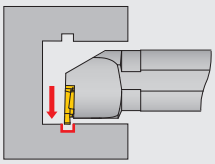


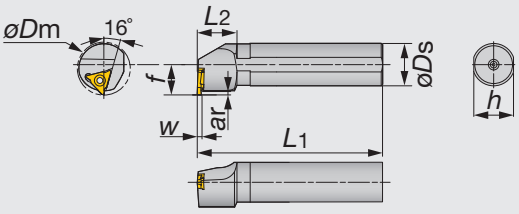


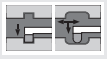
| Designation | Clamp | Clamping screw | Wrench |
|---|---|---|---|
| TGTTR/L*****16 | CP900 | MCS520-2.5 | P-2.5 |
| TGTTR/L*****22... | CP910 | MCS520-2.5 | P-2.5 |

## S-SGTR/L

Toolholders for internal grooving





Right hand (R) shown.

| Designation | W | øDm | ar | øDs | f | L1 | L2 | h | Insert |
|---|---|---|---|---|---|---|---|---|---|
| S25R-SGTR/L16 | 0.33 - 2.5 | 35 | 2 | 25 | 17.5 | 200 | 30 | 23 | GBL/R32... |
| S32S-SGTR/L22 | 1.25 - 4.5 | 40 | 2.5 | 32 | 23 | 250 | 30 | 30 | GBL/R43... |

• When using a right or left hand insert, the right hand insert (GBR) is used for the left hand toolholders (SGTL) , and the left hand insert (GBL) is used for the right hand toolholders (SGTR).

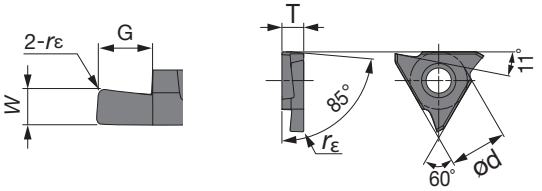
### SPARE PARTS




| Designation | Clamping screw | Wrench |
|---|---|---|
| S25R-SGTR/L16 | CSTB-4S | T-15F |
| S32S-SGTR/L22 | CSTB-5S | T-20F |

## APPLICABLE INSERT

### GBR/L32

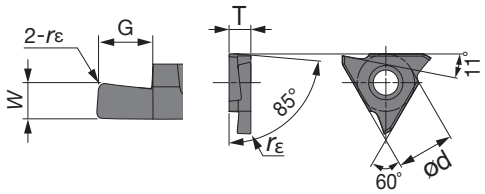



Right hand (R) shown.

| Designation | W±0.025 | rε | Coating AH710 | | Cermet NS9530 | | Uncoated KS05F | | G | ød | T |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | R | L | R | L | R | L | | | |
| GBR/L32033 | 0.33 | 0.03 | ● | ● | ● | | ● | | 0.8 | 9.525 | 3.18 |
| GBR/L32050 | 0.5 | 0.05 | ● | ● | ● | | ● | | 1.2 | 9.525 | 3.18 |
| GBR/L32075 | 0.75 | 0.05 | ● | ● | ● | ● | ● | | 2 | 9.525 | 3.18 |
| GBR/L32095 | 0.95 | 0.05 | ● | ● | ● | ● | ● | | 2 | 9.525 | 3.18 |
| GBR/L32100 | 1 | 0.05 | ● | ● | ● | ● | ● | | 2 | 9.525 | 3.18 |
| GBR/L32125 | 1.25 | 0.2 | ● | ● | ● | ● | ● | | 2 | 9.525 | 3.18 |
| GBR/L32145 | 1.45 | 0.2 | ● | ● | ● | | ● | | 2 | 9.525 | 3.18 |
| GBR/L32150 | 1.5 | 0.2 | ● | ● | ● | | ● | | 2 | 9.525 | 3.18 |
| GBR/L32200 | 2 | 0.2 | ● | ● | ● | | ● | | 2.5 | 9.525 | 3.18 |
| GBR/L32250 | 2.5 | 0.2 | ● | ● | ● | | ● | | 2.5 | 9.525 | 3.18 |

● : Line-up

### GBR/L43



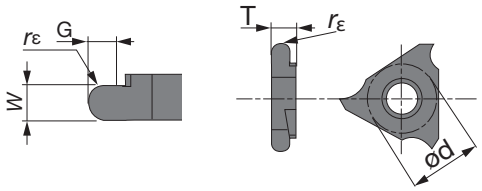

Right hand (R) shown.

| Designation | W±0.025 | rε | Coating AH710 | | Cermet NS9530 | | Uncoated KS05F | | G | ød | T |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | R | L | R | L | R | L | | | |
| GBR/L43125 | 1.25 | 0.2 | ● | ● | ● | | ● | | 2 | 12.7 | 4.76 |
| GBR/L43145 | 1.45 | 0.2 | ● | ● | ● | | ● | | 2 | 12.7 | 4.76 |
| GBR/L43150 | 1.5 | 0.2 | ● | ● | ● | ● | ● | | 3.5 | 12.7 | 4.76 |
| GBR/L43175 | 1.75 | 0.2 | ● | ● | ● | ● | ● | | 3.5 | 12.7 | 4.76 |
| GBR/L43185 | 1.85 | 0.2 | ● | ● | ● | ● | ● | | 3.5 | 12.7 | 4.76 |
| GBR/L43200 | 2 | 0.2 | ● | ● | ● | ● | ● | | 3.5 | 12.7 | 4.76 |
| GBR/L43230 | 2.3 | 0.2 | ● | ● | ● | ● | ● | | 3.5 | 12.7 | 4.76 |
| GBR/L43250 | 2.5 | 0.3 | ● | ● | ● | | ● | | 5 | 12.7 | 4.76 |
| GBR/L43265 | 2.65 | 0.3 | ● | ● | ● | | ● | | 5 | 12.7 | 4.76 |
| GBR/L43280 | 2.8 | 0.3 | ● | ● | ● | | ● | | 5 | 12.7 | 4.76 |
| GBR/L43300 | 3 | 0.3 | ● | ● | ● | | ● | | 5 | 12.7 | 4.76 |
| GBR/L43330 | 3.3 | 0.3 | ● | ● | ● | | ● | | 5 | 12.7 | 4.76 |
| GBR/L43350 | 3.5 | 0.3 | ● | ● | ● | | ● | | 5 | 12.7 | 4.76 |
| GBR/L43400 | 4 | 0.4 | ● | ● | ● | | ● | | 5 | 12.7 | 4.76 |
| GBR/L43430 | 4.3 | 0.4 | ● | ● | ● | | ● | | 5 | 12.7 | 4.76 |
| GBR/L43450 | 4.5 | 0.4 | ● | ● | ● | | ● | | 5 | 12.7 | 4.76 |

● : Line-up

## APPLICABLE INSERT

### GBR/L43-R (Radius)




Right hand (R) shown.

| Designation | W±0.025 | rε | Coating AH710 R | Coating AH710 L | Cermet NS9530 R | Cermet NS9530 L | Uncoated KS05F R | Uncoated KS05F L | G | ød | T |
|---|---|---|---|---|---|---|---|---|---|---|---|
| GBR/L43050R | 1 | 0.5 | ● | ● | ● | | ● | ● | 2 | 12.7 | 4.76 |
| GBR/L43075R | 1.5 | 0.75 | ● | ● | ● | | ● | ● | 3.5 | 12.7 | 4.76 |
| GBR/L43100R | 2 | 1 | ● | ● | ● | | ● | ● | 3.5 | 12.7 | 4.76 |
| GBR/L43125R | 2.5 | 1.25 | ● | ● | ● | | ● | ● | 5 | 12.7 | 4.76 |
| GBR/L43150R | 3 | 1.5 | ● | ● | ● | | ● | ● | 5 | 12.7 | 4.76 |
| GBR/L43200R | 4 | 2 | ● | ● | ● | | ● | ● | 5 | 12.7 | 4.76 |

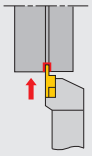
● : Line-up

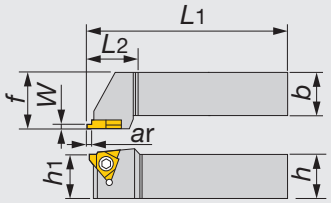
## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Hardness | Grade | Cutting speed Vc (m/min) | Feed f (mm/rev) |
|---|---|---|---|---|---|
| P | Carbon steels, Alloy steels C45, 18CrMo4, etc. | 150 - 240HB | NS9530 | 100 - 200 | 0.02 - 0.25 |
| | | 150 - 240HB | AH710 | 60 - 150 | 0.05 - 0.25 |
| M | Stainless steels X5CrNi18-9, etc. | ≤ 240HB | AH710 | 60 - 150 | 0.05 - 0.15 |
| K | Cast irons 250, etc. | Tensile strength ≤ 350 N/mm$^2$ | AH710 | 60 - 150 | 0.05 - 0.15 |
| N | Non-ferrous metals Aluminium, etc. | - | KS05F | 200 - 300 | 0.05 - 0.15 |

## SGTR/L

External toolholders for grooving, with triple corner inserts






Right hand (R) shown.

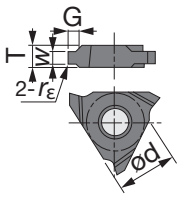
| Designation | W | ar | h | b | L1 | L2 | h1 | f | Insert |
|---|---|---|---|---|---|---|---|---|---|
| SGTR1616-3 | 1.15 - 2.7 | 1.5 - 3 | 16 | 16 | 100 | 20 | 16 | 20 | GLR/L3... |
| SGTR/L2020-3 | 1.15 - 2.7 | 1.5 - 3 | 20 | 20 | 125 | 20 | 20 | 25 | GLR/L3... |
| SGTR/L2525-3 | 1.15 - 2.7 | 1.5 - 3 | 25 | 25 | 150 | 20 | 25 | 32 | GLR/L3... |
| SGTR/L2020-4 | 1.15 - 4.2 | 1.5 - 4 | 20 | 20 | 125 | 30 | 20 | 25 | GLR/L4...,GOR/L4... |
| SGTR/L2525-4 | 1.15 - 4.2 | 1.5 - 4 | 25 | 25 | 150 | 30 | 25 | 32 | GLR/L4...,GOR/L4... |

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| SGTR/L****-3 | CSTB-4 | T-15F |
| SGTR/L****-4 | CSTB-5 | T-20F |

## APPLICABLE INSERT

### GOR/L (O-ring)

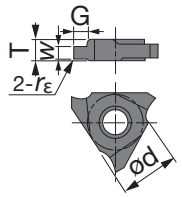



Right hand (R) shown.

| Designation | $W^{+0.1}_{+0.05}$ | rε | Cermet NS9530 | | Uncoated UX30 | | G | ød | T |
|---|---|---|---|---|---|---|---|---|---|
| | | | R | L | R | L | | | |
| GOR/L4190 | 2.5 | 0.4 | ● | | ● | | 1.5 | 12.7 | 4.76 |
| GOR/L4240 | 3.2 | 0.4 | ● | | ● | | 2 | 12.7 | 4.76 |
| GOR/L4310 | 4.1 | 0.7 | ● | | ● | | 2.5 | 12.7 | 4.76 |

● : Line-up

### GLR/L (Lock-ring)




Right hand (R) shown.

| Designation | $W^{+0.1}_{+0.05}$ | rε | Cermet NS9530 | | Uncoated UX30 | | G | ød | T |
|---|---|---|---|---|---|---|---|---|---|
| | | | R | L | R | L | | | |
| GLR/L3115 | 1.15 | 0.1 | ● | ● | ● | ● | 1.5 | 9.525 | 3.18 |
| GLR/L3135 | 1.35 | 0.1 | ● | ● | ● | | 1.5 | 9.525 | 3.18 |
| GLR/L3165 | 1.65 | 0.1 | ● | ● | ● | | 2 | 9.525 | 3.18 |
| GLR/L3175 | 1.75 | 0.1 | ● | ● | ● | ● | 2 | 9.525 | 3.18 |
| GLR/L3195 | 1.95 | 0.1 | ● | ● | ● | ● | 2.5 | 9.525 | 3.18 |
| GLR/L3220 | 2.2 | 0.1 | ● | | ● | ● | 3 | 9.525 | 3.18 |
| GLR/L3270 | 2.7 | 0.1 | ● | | ● | ● | 3 | 9.525 | 3.18 |
| GLR/L4115 | 1.15 | 0.1 | ● | | ● | | 1.5 | 12.7 | 4.76 |
| GLR/L4135 | 1.35 | 0.1 | ● | | ● | | 1.5 | 12.7 | 4.76 |
| GLR/L4165 | 1.65 | 0.1 | ● | | ● | | 2 | 12.7 | 4.76 |
| GLR/L4175 | 1.75 | 0.1 | ● | | ● | | 2 | 12.7 | 4.76 |
| GLR/L4190 | 1.9 | 0.1 | ● | | | | 2.5 | 12.7 | 4.76 |
| GLR/L4195 | 1.95 | 0.1 | ● | | ● | | 2.5 | 12.7 | 4.76 |
| GLR/L4220 | 2.2 | 0.1 | ● | | ● | ● | 3.5 | 12.7 | 4.76 |
| GLR/L4270 | 2.7 | 0.1 | ● | | ● | | 3.5 | 12.7 | 4.76 |
| GLR/L4320 | 3.2 | 0.1 | ● | | ● | ● | 4 | 12.7 | 4.76 |
| GLR/L4420 | 4.2 | 0.1 | ● | | ● | ● | 4 | 12.7 | 4.76 |

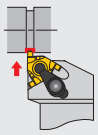
● : Line-up

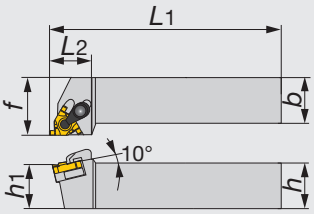
## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Grade | Cutting speed Vc (m/min) | Feed f (mm/rev) | | |
|---|---|---|---|---|---|---|
| | | | | W < 2 mm | W = 2 ~ 4 mm | W > 4 mm |
| P | Carbon steels | NS9530 | 80 - 200 | 0.05 - 0.1 | 0.08 - 0.2 | 0.08 - 0.25 |
| | | UX30 | 60 - 150 | 0.05 - 0.1 | 0.08 - 0.2 | 0.08 - 0.25 |

## CER/L

External grooving toolholders, alternative clamping of screw-on or clamp-on(DT type only)






Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | Insert |
|---|---|---|---|---|---|---|---|
| CER/L1212H16DT | 12 | 12 | 100 | 24 | 12 | 16 | GTGN16... |
| CER/L1616H16DT | 16 | 16 | 100 | 24 | 16 | 20 | GTGN16... |
| CER/L2020K16DT | 20 | 20 | 125 | 24 | 20 | 25 | GTGN16... |
| CER/L2525M16DT | 25 | 25 | 150 | 28 | 25 | 32 | GTGN16... |
| CER3232P16T | 32 | 32 | 170 | 32 | 32 | 40 | GTGN16... |

• A clamp set for CER/L type consists of a clamp and a clamping screw. • A shim set for CER/L type consists of a shim and a shim screw.
• Standard shims for CER/L type can be used for both left hand and right hand toolholders. Use either of the sides depending on the hand.
• When using the GTGN insert, the exclusive shim must be used. Exclusive shim should be ordered separately.

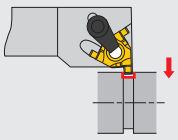
### SPARE PARTS

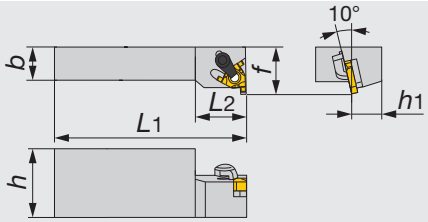
| Designation | Clamp set | Clamping screw | Shim screw | Shim * | Wrench | Wrench 1 |
|---|---|---|---|---|---|---|
| CER*****16DT | CSP16 | CSTB-3.5ST | DTS5-3.5 | G16ER/IL-DT | P-3.5 | T-15F |
| CEL*****16DT | CSP16 | CSTB-3.5ST | DTS5-3.5 | G16EL/IR-DT | P-3.5 | T-15F |
| CER3232P16T | CSP16 | - | - | G16ER/IR-S | - | T-15F |

* Option: Shim for Grooving

## B-S/CER/L

External threading toolholders for swiss lathes






Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | Insert |
|---|---|---|---|---|---|---|---|
| B-CER/L16M16 | 32 | 16 | 150 | 24 | 16 | 22 | GTGN16... |

• When using the GTGN insert, the exclusive shim must be used. Exclusive shim should be ordered separately.

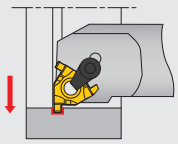
### SPARE PARTS

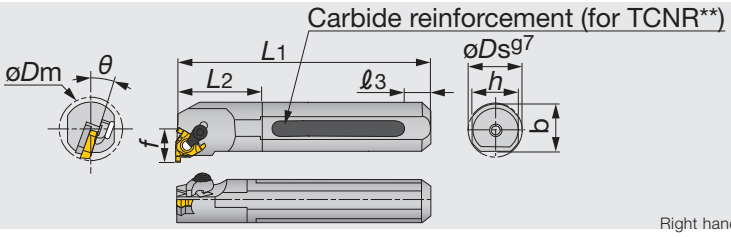
| Designation | Clamp set | Clamping screw | Wrench | Shim * |
|---|---|---|---|---|
| B-CER16M16 | CSP16 | - | T-15F | G16ER/IL-S |
| B-CEL16M16 | CSP16 | - | T-15F | G16EL/IR-S |

* Option: Shim for Grooving

## CNR/L

Internal grooving bars, alternative clamping of screw-on or clamp-on (DT type only)






Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | ℓ3 | h | b | θ° | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TCNR0020R16DT | TSUPPARI | 24 | 20 | 14 | 200 | 30 | 49 | 18 | - | 15 | GTGN-16... |
| TCNR0025S16DT | TSUPPARI | 29 | 25 | 16.5 | 250 | 38 | 64 | 23 | - | 15 | GTGN-16... |
| CNR/L0020P16 | STEEL | 24 | 20 | 14 | 170 | 30 | - | 18 | 19 | 15 | GTGN-16... |
| CNR/L0025R16 | STEEL | 29 | 25 | 16.5 | 200 | 38 | - | 23 | 24 | 15 | GTGN-16... |
| CNR/L0032S16 | STEEL | 37 | 32 | 20.1 | 250 | 48 | - | 30 | 31 | 15 | GTGN-16... |

- shim is used for both right and left hand foolholders.
- A clamp set for CNR/L type toolholders consists of a clamp and a clamping screw. • A shim set for CNR/L type toolholders consists of a shim and a shim fixing screw.
- Standard shims for CNR/L type toolholders are commonly used for right and left hand toolholders.
- When using the GTGN insert, the exclusive shim must be used. Exclusive shim should be ordered separately.

### SPARE PARTS

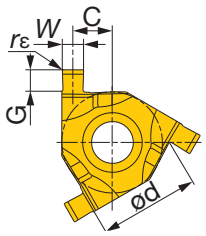
| Designation | Clamp set | Clamping screw | Shim screw | Shim * | Wrench | Wrench 1 |
|---|---|---|---|---|---|---|
| TCNR002**16DT | CSP16 | CSTB-3.5ST | DTS5-3.5 | G16EL/IR-DT | P-3.5 | T-15F |
| CNR00***16 | CSP16 | - | - | G16EL/IR-S | - | T-15F |
| CNL00***16 | CSP16 | - | - | G16ER/IL-S | - | T-15F |

* Option: Shim for Grooving



## INSERT

### GTGN16




Right hand (R) shown.

| Designation | W±0.03 | rε | SH730 | Insert size | ød | G | C | Shim: Dual method clamp type; Screw-on/ Clamp-on | Shim: Clamp-on type |
|---|---|---|---|---|---|---|---|---|---|
| GTGN-16ER/IL100 | 1 | 0.1 | ● | 16 | 9.525 | 1.25 | 4.22 | G16ER/IL-DT | G16ER/IL-S |
| GTGN-16ER/IL120 | 1.2 | 0.1 | ● | 16 | 9.525 | 1.3 | 4.12 | G16ER/IL-DT | G16ER/IL-S |
| GTGN-16ER/IL140 | 1.4 | 0.1 | ● | 16 | 9.525 | 1.5 | 4.02 | G16ER/IL-DT | G16ER/IL-S |
| GTGN-16ER/IL170 | 1.7 | 0.1 | ● | 16 | 9.525 | 1.7 | 3.87 | G16ER/IL-DT | G16ER/IL-S |
| GTGN-16ER/IL195 | 1.95 | 0.1 | ● | 16 | 9.525 | 1.7 | 3.75 | G16ER/IL-DT | G16ER/IL-S |
| GTGN-16ER/IL225 | 2.25 | 0.1 | ● | 16 | 9.525 | 1.8 | 3.6 | G16ER/IL-DT | G16ER/IL-S |
| GTGN-16EL/IR100 | 1 | 0.1 | ● | 16 | 9.525 | 1.25 | 4.22 | G16EL/IR-DT | G16EL/IR-S |
| GTGN-16EL/IR120 | 1.2 | 0.1 | ● | 16 | 9.525 | 1.3 | 4.12 | G16EL/IR-DT | G16EL/IR-S |
| GTGN-16EL/IR140 | 1.4 | 0.1 | ● | 16 | 9.525 | 1.5 | 4.02 | G16EL/IR-DT | G16EL/IR-S |
| GTGN-16EL/IR170 | 1.7 | 0.1 | ● | 16 | 9.525 | 1.7 | 3.87 | G16EL/IR-DT | G16EL/IR-S |
| GTGN-16EL/IR195 | 1.95 | 0.1 | ● | 16 | 9.525 | 1.7 | 3.75 | G16EL/IR-DT | G16EL/IR-S |
| GTGN-16EL/IR225 | 2.25 | 0.1 | ● | 16 | 9.525 | 1.8 | 3.6 | G16EL/IR-DT | G16EL/IR-S |

Note:
GTGN insert is applicable for both external and internal grooving, but the hand of tool is opposite in external and internal machining.
Shim for GTGN is exclusive to each type of toolholders

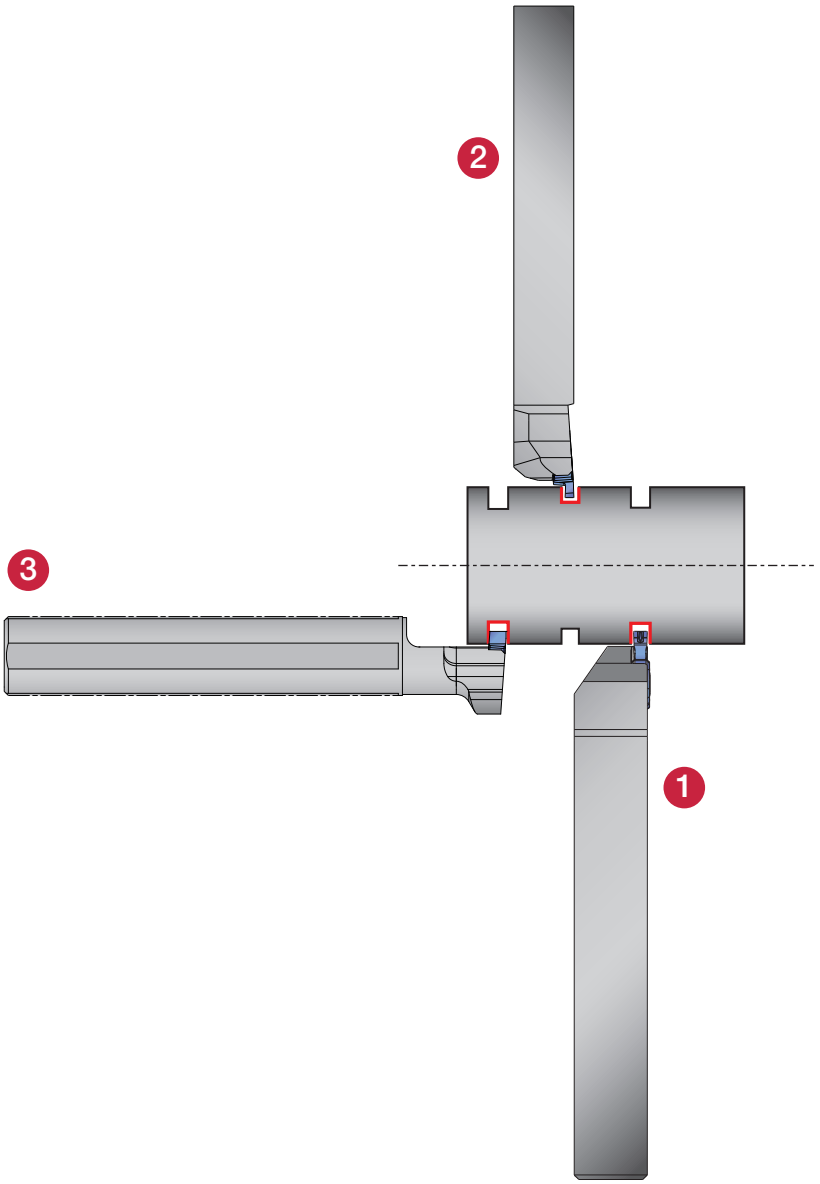
Package quantity = 10 pcs

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Grade | Cutting speed *Vc* (m/min) | Feed *f* (mm/rev) |
|---|---|---|---|---|
| P | Steels<br>C45, 42CrMo4, etc. | SH730 | 50 - 150 | 0.05 - 0.1 |
| M | Stainless steels<br>X5CrNi18-9, X5CrNiMo17-12-2, etc. | SH730 | 30 - 150 | 0.05 - 0.1 |
| S | Heat-resistant alloys, Titanium alloys etc.<br>Ti-6Al-4V, etc. | SH730 | 30 - 100 | 0.05 - 0.1 |

# **Multi-purpose grooving** line with economical insert containing **4 cutting edges**






**1 STCR/L -27**
*W* = 0.5 - 3.18 mm
*ar* = 1.6 - 6.4 mm
Shank size:
10 - 25 mm
C042

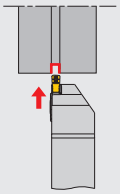
**2 STCR/L -18**
*W* = 0.33 - 3 mm
*ar* = 0.8 - 2.5 mm
Shank size:
10 - 25 mm
C049

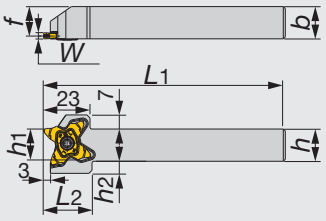
**3 JS-STCL18**
*W* = 0.33 - 3 mm
*ar* = 0.8 - 2.5 mm
Shank size:
ø14 - ø25.4 mm
C050

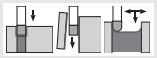
**STCR/L -27-CHP**
*W* = 0.5 - 3.18 mm
*ar* = 1.6 - 6.4 mm
Shank size:
25 mm
C042

## STCR/L-27

Precision external grooving tools with uniquely shaped insert with 4 cutting edges





Right hand (R) shown.

| Designation | W | h1 | b | h | L1 | f | h2 | L2 | Insert |
|---|---|---|---|---|---|---|---|---|---|
| STCR/L1010-27 | 0.5 - 3.18 | 10 | 10 | 10 | 120 | 8.5 | 9.5 | 24 | TC*27... |
| STCR/L1212-27 | 0.5 - 3.18 | 12 | 12 | 12 | 120 | 10.5 | 8 | 24 | TC*27... |
| STCR/L1616-27 | 0.5 - 3.18 | 16 | 16 | 16 | 120 | 14.5 | 6 | 24 | TC*27... |
| STCR/L2020-27 | 0.5 - 3.18 | 20 | 20 | 20 | 120 | 18.5 | 2 | 24 | TC*27... |
| STCR/L2525-27 | 0.5 - 3.18 | 25 | 25 | 25 | 135 | 23.5 | - | - | TC*27... |

### SPARE PARTS

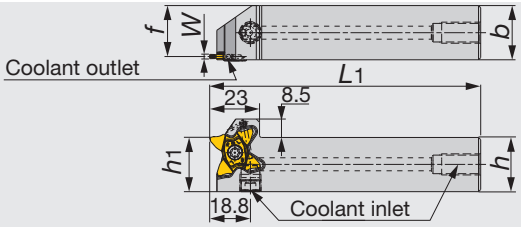


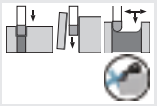


| Designation | Screw | Wrench |
|---|---|---|
| STCR****-27 | SR16-212-01397L | T-2010/5 |
| STCL****-27 | SR16-212-01397 | T-2010/5 |

## STCR/L-CHP

Precision external grooving tools with uniquely shaped insert, with channels for high pressure coolant.



Right hand (R) shown.

| Designation | W | h1 | b | h | L1 | f | Insert |
|---|---|---|---|---|---|---|---|
| STCR/L2525-27-CHP | 0.5 - 3.18 | 25 | 25 | 25 | 125 | 23.5 | TC*27... |

### SPARE PARTS





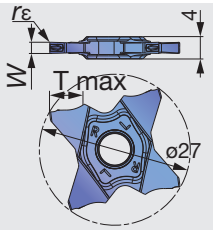
| Designation | Screw | Wrench |
|---|---|---|
| STCR****-27-CHP | SR16-212-01397L | T-2010/5 |
| STCL****-27-CHP | SR16-212-01397 | T-2010/5 |

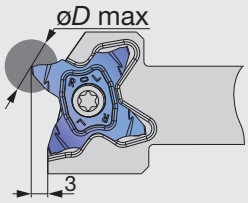
## STANDARD CUTTING CONDITIONS

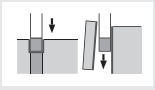
| ISO | Workpiece material | Grade | Cutting speed Vc (m/min) | Feed: f (mm/rev) | | | | | Depth of cut for profiling (with full radius insert) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Grooving, parting off | | Parting off (with hand) | Profiling (with full radius insert) | | |
| | | | | TCS | TCM | TCS | TCS | TCM | |
| P | Carbon steel C45, etc. | AH725 | 100 - 200 | 0.05 - 0.15 | 0.05 - 0.25 | 0.04 - 0.12 | 0.05 - 0.1 | 0.05 - 0.15 | 0.5 |
| | Alloy steel 34CrMo4, etc. | AH725 | 50 -180 | 0.05 - 0.15 | 0.05 - 0.25 | 0.04 - 0.12 | 0.05 - 0.1 | 0.05 - 0.15 | 0.5 |
| M | Stainless steel X5CrNi18-9, etc. | AH725 | 100 - 150 | 0.05 - 0.15 | 0.05 - 0.2 | 0.04 - 0.12 | 0.05 - 0.1 | 0.05 - 0.15 | 0.5 |
| K | Grey cast iron 250, etc. | AH725 | 50 - 180 | 0.05 - 0.15 | 0.05 - 0.25 | 0.04 - 0.12 | 0.05 - 0.1 | 0.05 - 0.15 | 0.5 |
| | Ductile cast iron 400-15, etc. | AH725 | 50 - 120 | 0.05 - 0.15 | 0.05 - 0.2 | 0.04 - 0.12 | 0.05 - 0.1 | 0.05 - 0.15 | 0.5 |
| S | Titanium alloys Ti-6Al-4V, etc. | AH725 | 30 - 60 | 0.05 - 0.15 | 0.05 - 0.15 | 0.04 - 0.12 | 0.05 - 0.1 | 0.05 - 0.1 | 0.5 |

# INSERT - FOR GROOVING AND PARTING OFF

## TCS27



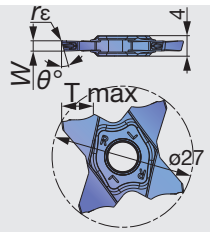
| Designation | W ± 0.02 | rε | AH725 | T max | øD max | Relation of groove depth (T) and Max. diameter (øD max) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | T≤1 | T≤2 | T≤3 | T≤3.5 | T≤4 | T≤4.5 | T≤5 | T≤5.5 | T≤5.7 | T≤6 | T≤6.2 | T≤6.4 |
| TCS27-050-000 | 0.5 | 0 | ● | 1 | 2 | ∞ | - | - | - | - | - | - | - | - | - | - | - |
| TCS27-050-004 | 0.5 | 0.04 | ● | 2.5 | 5 | ∞ | ∞ | - | - | - | - | - | - | - | - | - | - |
| TCS27-075-010 | 0.75 | 0.1 | ● | 2.5 | 5 | ∞ | ∞ | - | - | - | - | - | - | - | - | - | - |
| TCS27-080-000 | 0.8 | 0 | ● | 1.6 | 3.2 | ∞ | - | - | - | - | - | - | - | - | - | - | - |
| TCS27-100-006 | 1 | 0.06 | ● | 3.5 | 7 | ∞ | ∞ | ∞ | 600 | - | - | - | - | - | - | - | - |
| TCS27-100-010 | 1 | 0.1 | ● | 3.5 | 7 | ∞ | ∞ | ∞ | 600 | - | - | - | - | - | - | - | - |
| TCS27-104-000 | 1.04 | 0 | ● | 2 | 4 | ∞ | ∞ | - | - | - | - | - | - | - | - | - | - |
| TCS27-120-000 | 1.2 | 0 | ● | 2 | 4 | ∞ | ∞ | - | - | - | - | - | - | - | - | - | - |
| TCS27-125-010 | 1.25 | 0.1 | ● | 3.5 | 7 | ∞ | ∞ | ∞ | 600 | - | - | - | - | - | - | - | - |
| TCS27-125-020 | 1.25 | 0.2 | ● | 3.5 | 7 | ∞ | ∞ | ∞ | 600 | - | - | - | - | - | - | - | - |
| TCS27-140-000 | 1.4 | 0 | ● | 2 | 4 | ∞ | ∞ | - | - | - | - | - | - | - | - | - | - |
| TCS27-147-000 | 1.47 | 0 | ● | 2.5 | 5 | ∞ | ∞ | - | - | - | - | - | - | - | - | - | - |
| TCS27-150-010 | 1.5 | 0.1 | ● | 5.7 | 11.4 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 130 | 50 | 35 | - | - | - |
| TCS27-150-020 | 1.5 | 0.2 | ● | 5.7 | 11.4 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 130 | 50 | 35 | - | - | - |
| TCS27-157-015 | 1.57 | 0.15 | ● | 3 | 6 | ∞ | ∞ | ∞ | - | - | - | - | - | - | - | - | - |
| TCS27-170-010 | 1.7 | 0.1 | ● | 3 | 6 | ∞ | ∞ | ∞ | - | - | - | - | - | - | - | - | - |
| TCS27-175-010 | 1.75 | 0.1 | ● | 3 | 6 | ∞ | ∞ | ∞ | - | - | - | - | - | - | - | - | - |
| TCS27-175-020 | 1.75 | 0.2 | ● | 3 | 6 | ∞ | ∞ | ∞ | - | - | - | - | - | - | - | - | - |
| TCS27-178-018 | 1.78 | 0.18 | ● | 3 | 6 | ∞ | ∞ | ∞ | - | - | - | - | - | - | - | - | - |
| TCS27-185-020 | 1.85 | 0.2 | ● | 3 | 6 | ∞ | ∞ | ∞ | - | - | - | - | - | - | - | - | - |
| TCS27-196-015 | 1.96 | 0.15 | ● | 3 | 6 | ∞ | ∞ | ∞ | - | - | - | - | - | - | - | - | - |
| TCS27-200-010 | 2 | 0.1 | ● | 6.4 | 12.8 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 130 | 105 | 85 | 60 | 50 | 30 |
| TCS27-200-020 | 2 | 0.2 | ● | 6.4 | 12.8 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 130 | 105 | 85 | 60 | 50 | 30 |
| TCS27-222-015 | 2.22 | 0.15 | ● | 3.5 | 7 | ∞ | ∞ | ∞ | 600 | - | - | - | - | - | - | - | - |
| TCS27-230-020 | 2.3 | 0.2 | ● | 3.5 | 7. | ∞ | ∞ | ∞ | 600 | - | - | - | - | - | - | - | - |
| TCS27-239-015 | 2.39 | 0.15 | ● | 5.7 | 11.4 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 130 | 50 | 35 | - | - | - |
| TCS27-247-020 | 2.47 | 0.2 | ● | 5.7 | 11.4 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 130 | 50 | 35 | - | - | - |
| TCS27-250-010 | 2.5 | 0.1 | ● | 5.7 | 11.4 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 130 | 50 | 35 | - | - | - |
| TCS27-250-030 | 2.5 | 0.3 | ● | 5.7 | 11.4 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 130 | 50 | 35 | - | - | - |
| TCS27-270-010 | 2.7 | 0.1 | ● | 6.2 | 12.4 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 135 | 105 | 95 | 85 | 78 | - |
| TCS27-287-020 | 2.87 | 0.2 | ● | 6.2 | 12.4 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 135 | 105 | 95 | 85 | 78 | - |
| TCS27-300-000 | 3 | 0 | ● | 6.4 | 12.8 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 135 | 105 | 95 | 85 | 78 | 55 |
| TCS27-300-020 | 3 | 0.2 | ● | 6.4 | 12.8 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 135 | 105 | 95 | 85 | 78 | 55 |
| TCS27-300-030 | 3 | 0.3 | ● | 6.4 | 12.8 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 135 | 105 | 95 | 85 | 78 | 55 |
| TCS27-300-040 | 3 | 0.4 | ● | 6.4 | 12.8 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 135 | 105 | 95 | 85 | 78 | 55 |
| TCS27-315-015 | 3.15 | 0.15 | ● | 6.4 | 12.8 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 135 | 105 | 95 | 85 | 78 | 68 |
| TCS27-318-020 | 3.18 | 0.2 | ● | 6.4 | 12.8 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 135 | 105 | 95 | 85 | 78 | 68 |

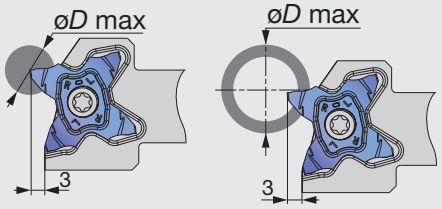
Package Quantity = 5 pcs.

● : Line-up

# INSERT - FOR PARTING OFF

## TCS27-R/L





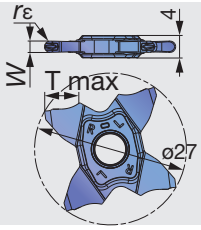

Right hand (R) shown.

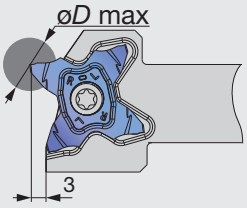
| Designation | W ± 0.02 | rε | AH725 | | T max | θ° | Max. parting off dia. øD max | |
|---|---|---|---|---|---|---|---|---|
| | | | R | L | | | Solid bar | Tube |
| TCS27-100-15R/L | 1 | 0.06 | ● | ● | 3.5 | 15 | 7 | 600 |
| TCS27-150-6R/L | 1.5 | 0.06 | ● | ● | 5.7 | 6 | 11.4 | 35 |
| TCS27-150-15R/L | 1.5 | 0.06 | ● | ● | 5.7 | 15 | 11.4 | 35 |
| TCS27-200-6R/L | 2 | 0.1 | ● | ● | 6.4 | 6 | 12.8 | 30 |
| TCS27-200-15R/L | 2 | 0.1 | ● | ● | 6.4 | 15 | 12.8 | 30 |

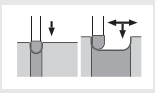
Package Quantity = 5 pcs.
● : Line-up

# INSERT - FOR GROOVING AND PROFILING

## TCS27-Full R



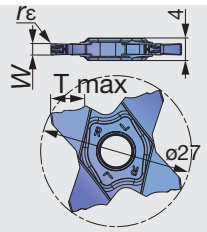
| Designation | W ± 0.02 | rε | AH725 | T max | Relation of groove depth (T) and Max. diameter (øD max) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | T≤1 | T≤2 | T≤3 | T≤3.5 | T≤4 | T≤4.5 | T≤5 | T≤5.5 | T≤5.7 | T≤6 | T≤6.2 | T≤6.4 |
| TCS27-157-079 | 1.57 | 0.79 | ● | 3 | ∞ | ∞ | ∞ | - | - | - | - | - | - | - | - | - |
| TCS27-200-100 | 2 | 1 | ● | 3 | ∞ | ∞ | ∞ | - | - | - | - | - | - | - | - | - |
| TCS27-239-120 | 2.39 | 1.2 | ● | 5.7 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 130 | 50 | 35 | - | - | - |
| TCS27-300-150 | 3 | 1.5 | ● | 6.4 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 135 | 105 | 95 | 85 | 78 | 55 |

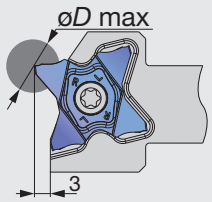
Package Quantity = 5 pcs.

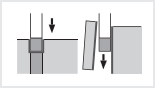
● : Line-up

# INSERT - FOR GROOVING AND PARTING OFF

## TCM27



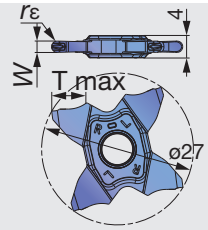
| Designation | W ± 0.02 | rε | AH725 | T max | øD max | Relation of groove depth (T) and Max. diameter (øD max) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | T≤1 | T≤2 | T≤3 | T≤3.5 | T≤4 | T≤4.5 | T≤5 | T≤5.5 | T≤5.7 | T≤6 | T≤6.2 | T≤6.4 |
| TCM27-150-010 | 1.5 | 0.1 | ● | 5.7 | 11.4 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 130 | 50 | 35 | - | - | - |
| TCM27-150-020 | 1.5 | 0.2 | ● | 5.7 | 11.4 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 130 | 50 | 35 | - | - | - |
| TCM27-157-015 | 1.57 | 0.15 | ● | 3 | 6 | ∞ | ∞ | ∞ | - | - | - | - | - | - | - | - | - |
| TCM27-170-010 | 1.7 | 0.1 | ● | 3 | 6 | ∞ | ∞ | ∞ | - | - | - | - | - | - | - | - | - |
| TCM27-175-010 | 1.75 | 0.1 | ● | 3 | 6 | ∞ | ∞ | ∞ | - | - | - | - | - | - | - | - | - |
| TCM27-175-020 | 1.75 | 0.2 | ● | 3 | 6 | ∞ | ∞ | ∞ | - | - | - | - | - | - | - | - | - |
| TCM27-178-018 | 1.78 | 0.18 | ● | 3 | 6 | ∞ | ∞ | ∞ | - | - | - | - | - | - | - | - | - |
| TCM27-185-020 | 1.85 | 0.2 | ● | 3 | 6 | ∞ | ∞ | ∞ | - | - | - | - | - | - | - | - | - |
| TCM27-196-015 | 1.96 | 0.15 | ● | 3 | 6 | ∞ | ∞ | ∞ | - | - | - | - | - | - | - | - | - |
| TCM27-200-010 | 2 | 0.1 | ● | 6.4 | 12.8 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 130 | 105 | 85 | 60 | 50 | 30 |
| TCM27-200-020 | 2 | 0.2 | ● | 6.4 | 12.8 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 130 | 105 | 85 | 60 | 50 | 30 |
| TCM27-222-015 | 2.22 | 0.15 | ● | 3.5 | 7 | ∞ | ∞ | ∞ | 600 | - | - | - | - | - | - | - | - |
| TCM27-230-020 | 2.3 | 0.2 | ● | 3.5 | 7 | ∞ | ∞ | ∞ | 600 | - | - | - | - | - | - | - | - |
| TCM27-239-015 | 2.39 | 0.15 | ● | 5.7 | 11.4 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 130 | 50 | 35 | - | - | - |
| TCM27-247-020 | 2.47 | 0.2 | ● | 5.7 | 11.4 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 130 | 50 | 35 | - | - | - |
| TCM27-250-010 | 2.5 | 0.1 | ● | 5.7 | 11.4 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 130 | 50 | 35 | - | - | - |
| TCM27-250-030 | 2.5 | 0.3 | ● | 5.7 | 11.4 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 130 | 50 | 35 | - | - | - |
| TCM27-270-010 | 2.7 | 0.1 | ● | 6.2 | 12.4 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 135 | 105 | 95 | 85 | 78 | - |
| TCM27-287-020 | 2.87 | 0.2 | ● | 6.2 | 12.4 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 135 | 105 | 95 | 85 | 78 | - |
| TCM27-300-000 | 3 | 0 | ● | 6.4 | 12.8 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 135 | 105 | 95 | 85 | 78 | 55 |
| TCM27-300-020 | 3 | 0.2 | ● | 6.4 | 12.8 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 135 | 105 | 95 | 85 | 78 | 55 |
| TCM27-300-030 | 3 | 0.3 | ● | 6.4 | 12.8 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 135 | 105 | 95 | 85 | 78 | 55 |
| TCM27-300-040 | 3 | 0.4 | ● | 6.4 | 12.8 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 135 | 105 | 95 | 85 | 78 | 55 |
| TCM27-315-015 | 3.15 | 0.15 | ● | 6.4 | 12.8 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 135 | 105 | 95 | 85 | 78 | 68 |
| TCM27-318-020 | 3.18 | 0.2 | ● | 6.4 | 12.8 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 135 | 105 | 95 | 85 | 78 | 68 |

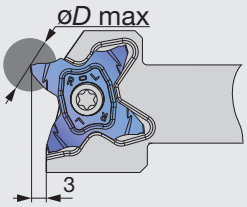
Package Quantity = 5 pcs.

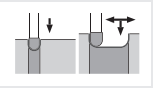
● : Line-up

## INSERT - FOR GROOVING AND PROFILING

### TCM27-Full R



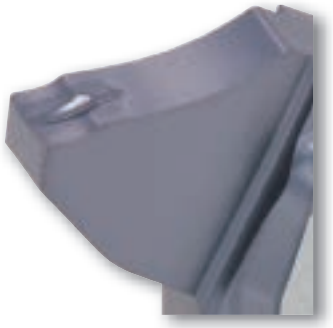



| Designation | W ± 0.02 | rε | AH725 | T max | Relation of groove depth (T) and Max. diameter (øD max) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | T≤1 | T≤2 | T≤3 | T≤3.5 | T≤4 | T≤4.5 | T≤5 | T≤5.5 | T≤5.7 | T≤6 | T≤6.2 | T≤6.4 |
| TCM27-157-079 | 1.57 | 0.79 | ● | 3 | ∞ | ∞ | ∞ | - | - | - | - | - | - | - | - | - |
| TCM27-200-100 | 2 | 1 | ● | 3.5 | ∞ | ∞ | ∞ | 600 | - | - | - | - | - | - | - | - |
| TCM27-239-120 | 2.39 | 1.2 | ● | 5.7 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 130 | 50 | 35 | - | - | - |
| TCM27-300-150 | 3 | 1.5 | ● | 6.4 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 135 | 105 | 95 | 85 | 78 | 55 |

Package Quantity = 5 pcs.
● : Line-up

## CHIPBREAKER

### TCS27



*W* = 0.5 mm – 3.18 mm
For general machining
Lower cutting force and superior sharpness

### TCM27



*W* = 1.5 mm – 3.18 mm
For high feed machining
Well-designed edge with high strength

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Grade | Cutting speed *Vc* (m/min) | Feed: *f* (mm/rev) | | | | | Depth of cut for profiling (with full radius insert) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Grooving, parting-off | | Parting-off (with hand) | Profiling (with full radius insert) | | |
| | | | | TCS | TCM | TCS | TCS | TCM | |
| P | Carbon steel C45, etc. | AH725 | 100 - 200 | 0.05 - 0.15 | 0.05 - 0.25 | 0.04 - 0.12 | 0.05 - 0.1 | 0.05 - 0.15 | 0.5 |
| P | Alloy steel 34CrMo4, etc. | AH725 | 50 -180 | 0.05 - 0.15 | 0.05 - 0.25 | 0.04 - 0.12 | 0.05 - 0.1 | 0.05 - 0.15 | 0.5 |
| M | Stainless steel X5CrNi18-9, etc. | AH725 | 100 - 150 | 0.05 - 0.15 | 0.05 - 0.2 | 0.04 - 0.12 | 0.05 - 0.1 | 0.05 - 0.15 | 0.5 |
| K | Grey cast iron 250, etc. | AH725 | 50 - 180 | 0.05 - 0.15 | 0.05 - 0.25 | 0.04 - 0.12 | 0.05 - 0.1 | 0.05 - 0.15 | 0.5 |
| K | Ductile cast iron 400-15, etc. | AH725 | 50 - 120 | 0.05 - 0.15 | 0.05 - 0.2 | 0.04 - 0.12 | 0.05 - 0.1 | 0.05 - 0.15 | 0.5 |
| S | Titanium alloys Ti-6Al-4V, etc. | AH725 | 30 - 60 | 0.05 - 0.15 | 0.05 - 0.15 | 0.04 - 0.12 | 0.05 - 0.1 | 0.05 - 0.1 | 0.5 |



## PARTS FOR COOLANT HOSE

### Connecting hose

Fig. 1

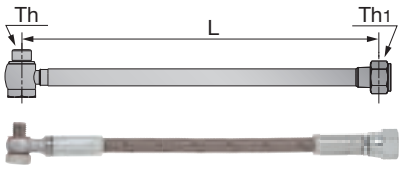
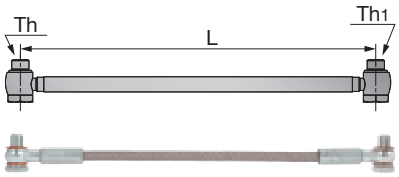
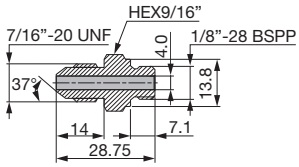



Fig. 2




| Designation | Length L | Threading size Th | Threading size Th1 | Max. pressure (MPa) | Fig. |
|---|---|---|---|---|---|
| CHP-HOSE-G1/8-7/16-200BS | 200 | G1/8"-28 BSPP | 7/16"-20 UNF | 26 | 1 |
| CHP-HOSE-G1/8-7/16-250BS | 250 | G1/8"-28 BSPP | 7/16"-20 UNF | 26 | 1 |
| CHP-HOSE-G1/8-G1/8-200BB | 200 | G1/8"-28 BSPP | G1/8"-28 BSPP | 26 | 2 |
| CHP-HOSE-G1/8-G1/8-250BB | 250 | G1/8"-28 BSPP | G1/8"-28 BSPP | 26 | 2 |

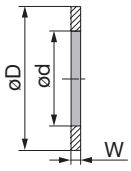
### Connector






| Designation |
|---|
| CHP-NIPPLE-G1/8-7/16UNF |

### Seal washer

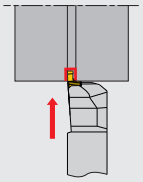


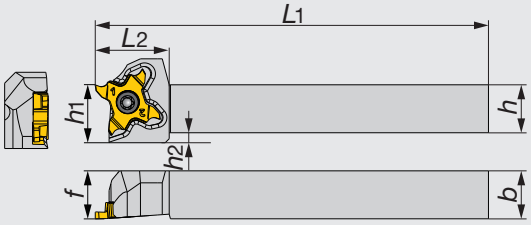


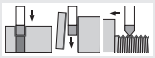

| Designation | øD | ød | W |
|---|---|---|---|
| CHP-COPPER-SEAL1/8 | 15 | 10 | 1 |

# STCR/L-18

Precision external grooving and threading tools with uniquely shaped insert for swiss lathes





Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *h*2 | Insert |
|---|---|---|---|---|---|---|---|---|
| STCR/L1010X18 | 10 | 10 | 120 | 18.5 | 10 | 10 | 4.5 | TC*18... |
| STCR/L1212F18 | 12 | 12 | 85 | 18.5 | 12 | 12 | 2.5 | TC*18... |
| STCR/L1212X18 | 12 | 12 | 120 | 18.5 | 12 | 12 | 2.5 | TC*18... |
| STCR/L1616X18 | 16 | 16 | 120 | 18.5 | 16 | 16 | - | TC*18... |
| STCR/L2020H18 | 20 | 20 | 100 | 18.5 | 20 | 20 | - | TC*18... |
| STCR/L2020X18 | 20 | 20 | 120 | 23 | 20 | 25 | - | TC*18... |
| STCR/L2525Z18 | 25 | 25 | 135 | 23 | 25 | 30 | - | TC*18... |

• The right hand insert (TC*18R***) is used for the right hand toolholders (STCR***), and the left hand insert (TC*18L***) is used for the left hand toolholders (STCL***).

## SPARE PARTS

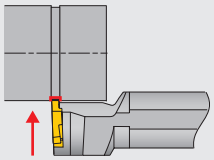


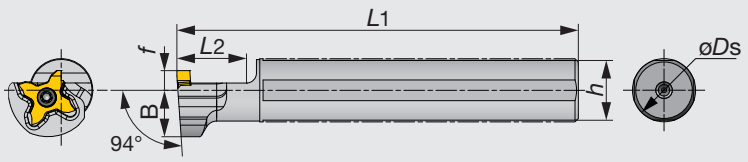


| Designation | Clamping screw | Wrench |
|---|---|---|
| STCR*****18 | CSTC-4L100DL | T-1008/5 |
| STCL*****18 | CSTC-4L100DR | T-1008/5 |

# JS-STCL18

Precision grooving tools with uniquely shaped insert for swiss lathes






Left hand (L) shown.

| Designation | øDs | L1 | L2 | h | B | f | Insert |
|---|---|---|---|---|---|---|---|
| JS14H-STCL18 | 14 | 100 | 20 | 13 | 14 | 6 | TC*18... |
| JS159F-STCL18 | 15.875 | 85 | 20 | 15 | 14 | 6 | TC*18... |
| JS16F-STCL18 | 16 | 85 | 20 | 15 | 14 | 6 | TC*18... |
| JS19G-STCL18 | 19.05 | 90 | 20 | 18 | 14 | 6 | TC*18... |
| JS19X-STCL18 | 19.05 | 120 | 20 | 18 | 14 | 6 | TC*18... |
| JS20G-STCL18 | 20 | 90 | 20 | 19 | 14 | 6 | TC*18... |
| JS20X-STCL18 | 20 | 120 | 20 | 19 | 14 | 6 | TC*18... |
| JS22X-STCL18 | 22 | 120 | 20 | 21 | 12.25 | 10 | TC*18... |
| JS25H-STCL18 | 25 | 100 | 20 | 24 | 12.25 | 10 | TC*18... |
| JS254X-STCL18 | 25.4 | 120 | 20 | 24 | 12.25 | 10 | TC*18... |

• The right hand insert (TC*18R***) is used for the left hand toolholders (STCL***).

## SPARE PARTS





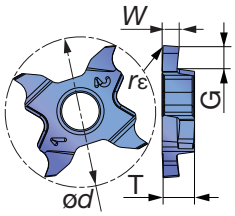
| Designation | Clamping screw | Wrench |
|---|---|---|
| JS****-STCL18 | CSTC-4L100DL | T-1008/5 |

Grooving Tool

## INSERT

### TCP18R/L-F (sharp edge)



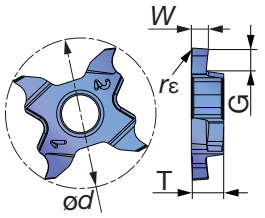



| Designation | W±0.02 | rε | SH725 R | SH725 L | G | T | ød |
|---|---|---|---|---|---|---|---|
| TCP18R/L033F-005 | 0.33 | 0.05 | ● | ● | 0.8 | 4 | 18 |
| TCP18R/L043F-005 | 0.43 | 0.05 | ● | ● | 1.2 | 4 | 18 |
| TCP18R/L050F-005 | 0.5 | 0.05 | ● | ● | 1.2 | 4 | 18 |
| TCP18R/L075F-005 | 0.75 | 0.05 | ● | ● | 2 | 4 | 18 |
| TCP18R/L095F-005 | 0.95 | 0.05 | ● | ● | 2 | 4 | 18 |
| TCP18R/L100F-010 | 1 | 0.1 | ● | ● | 2 | 4 | 18 |
| TCP18R/L120F-010 | 1.2 | 0.1 | ● | ● | 2 | 4 | 18 |
| TCP18R/L125F-010 | 1.25 | 0.1 | ● | ● | 2 | 4 | 18 |
| TCP18R/L145F-010 | 1.45 | 0.1 | ● | ● | 2 | 4 | 18 |
| TCP18R/L150F-010 | 1.5 | 0.1 | ● | ● | 2 | 4 | 18 |
| TCP18R/L175F-010 | 1.75 | 0.1 | ● | ● | 2 | 4 | 18 |
| TCP18R/L200F-010 | 2 | 0.1 | ● | ● | 2.5 | 4 | 18 |
| TCP18R/L250F-010 | 2.5 | 0.1 | ● | ● | 2.5 | 4 | 18 |
| TCP18R/L300F-010 | 3 | 0.1 | ● | ● | 2.5 | 4 | 18 |

● : Line-up

## TCP18R/L(honed edge)






| Designation | W±0.02 | rε | AH725 | | G | T | ød |
|---|---|---|---|---|---|---|---|
| | | | R | L | | | |
| TCP18R/L033-005 | 0.33 | 0.05 | ● | ● | 0.8 | 4 | 18 |
| TCP18R/L043-005 | 0.43 | 0.05 | ● | ● | 1.2 | 4 | 18 |
| TCP18R/L050-005 | 0.5 | 0.05 | ● | ● | 1.2 | 4 | 18 |
| TCP18R/L075-005 | 0.75 | 0.05 | ● | ● | 2 | 4 | 18 |
| TCP18R/L095-005 | 0.95 | 0.05 | ● | ● | 2 | 4 | 18 |
| TCP18R/L100-010 | 1 | 0.1 | ● | ● | 2 | 4 | 18 |
| TCP18R/L120-010 | 1.2 | 0.1 | ● | ● | 2 | 4 | 18 |
| TCP18R/L125-010 | 1.25 | 0.1 | ● | ● | 2 | 4 | 18 |
| TCP18R/L145-010 | 1.45 | 0.1 | ● | ● | 2 | 4 | 18 |
| TCP18R/L150-010 | 1.5 | 0.1 | ● | ● | 2 | 4 | 18 |
| TCP18R/L175-010 | 1.75 | 0.1 | ● | ● | 2 | 4 | 18 |
| TCP18R/L200-010 | 2 | 0.1 | ● | ● | 2.5 | 4 | 18 |
| TCP18R/L250-010 | 2.5 | 0.1 | ● | ● | 2.5 | 4 | 18 |
| TCP18R/L300-010 | 3 | 0.1 | ● | ● | 2.5 | 4 | 18 |

● : Line-up

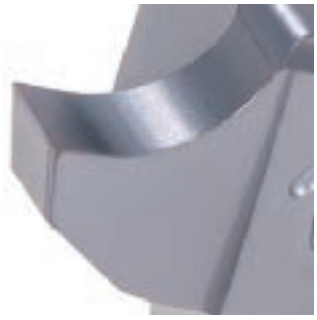


## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Priority | Grade | Cutting speed Vc (m/min) | Feed f (mm/rev) |
|---|---|---|---|---|---|
| P | Low carbon steels (C15, C20 etc.) | First choice | SH725 | 80 - 180 | 0.03 - 0.1 |
| | | Toughness | AH725 | 80 - 180 | 0.03 - 0.1 |
| | Carbon steels, Alloy steels (C55, 42CrMoS4 etc.) | First choice | SH725 | 80 - 180 | 0.03 - 0.1 |
| | | Toughness | AH725 | 80 - 180 | 0.03 - 0.1 |
| | Prehardened steels (NAK80, PX5 etc.) | First choice | SH725 | 80 - 180 | 0.03 - 0.1 |
| | | Toughness | AH725 | 80 - 180 | 0.03 - 0.1 |
| M | Stainless steels (X5CrNi18-9, X5CrNiMo17-12-2 etc) | First choice | SH725 | 50 - 120 | 0.03 - 0.1 |
| | | Toughness | AH725 | 50 - 120 | 0.03 - 0.1 |
| K | Grey cast irons (250, 300 etc.) | First choice | AH725 | 50 - 180 | 0.03 - 0.1 |
| | | Sharpness | SH725 | 50 - 180 | 0.03 - 0.1 |
| | Ductile cast irons (400-15, 600-3 etc.) | First choice | AH725 | 50 - 180 | 0.03 - 0.1 |
| | | Sharpness | SH725 | 50 - 180 | 0.03 - 0.1 |
| S | Titanium alloys (Ti-6Al-4V, etc.) | First choice | SH725 | 20 - 80 | 0.03 - 0.1 |
| | | Toughness | AH725 | 20 - 80 | 0.03 - 0.1 |
| | Superalloys (Inconel718, etc.) | First choice | SH725 | 20 - 80 | 0.03 - 0.1 |
| | | Toughness | AH725 | 20 - 80 | 0.03 - 0.1 |

## CHIPBREAKER

# TCP18

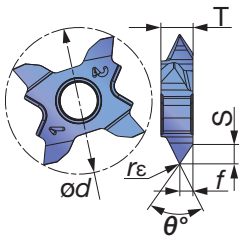


*W* = 0.33 mm – 3 mm
Suitable for small parts on swiss lathe
Low cutting force with large rake angle

## INSERT

### TCT18R/L (For Threading)






| Designation | rε | AH725 | | pitch min | pitch max | f | S | θ° | T | ød |
|---|---|---|---|---|---|---|---|---|---|---|
| | | R | L | | | | | | | |
| TCT18R/L-60N-010 | 0.1 | ● | ● | 0.8 | 3 | 1.6 | 2.67 | 60 | 4 | 18 |
| TCT18R/L-60N-020 | 0.2 | ● | ● | 1.5 | 3 | 1.6 | 2.57 | 60 | 4 | 18 |

● : Line-up

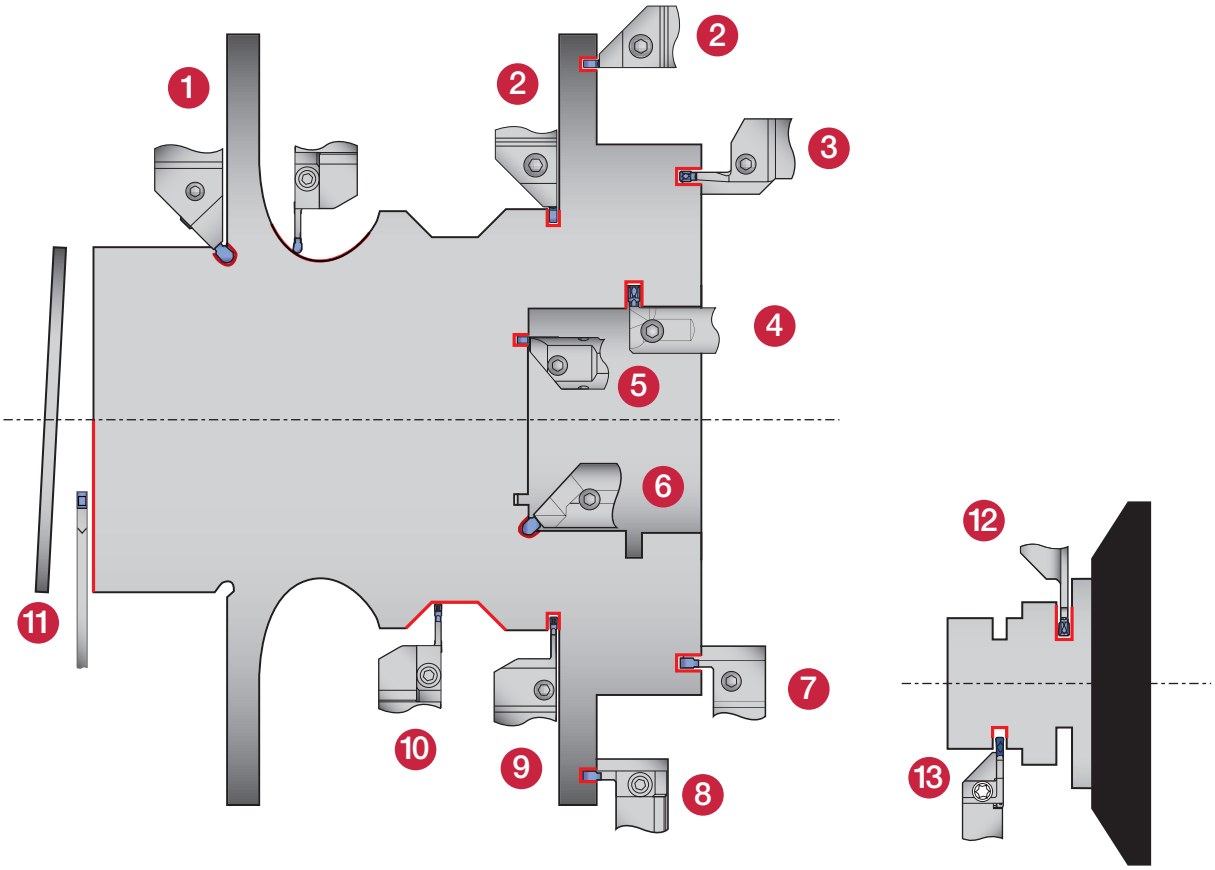


## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Grade | Cutting speed Vc (m/min) | Pitch (mm) | TPI |
|---|---|---|---|---|---|
| P | Low carbon steels (C15, C20 etc.) | AH725 | 60 - 150 | 0.8 - 3 | 32 - 8 |
| P | Carbon steels, Alloy steels (C55, 42CrMoS4 etc.) | AH725 | 60 - 150 | 0.8 - 3 | 32 - 8 |
| P | Prehardened steels (NAK80, PX5 etc.) | AH725 | 60 - 150 | 0.8 - 3 | 32 - 8 |
| M | Stainless steels (X5CrNi18-9, X5CrNiMo17-12-2 etc) | AH725 | 50 - 80 | 0.8 - 3 | 32 - 8 |
| K | Grey cast irons (250, 300 etc.) | AH725 | 50 - 100 | 0.8 - 3 | 32 - 8 |
| K | Ductile cast irons (400-15, 600-3 etc.) | AH725 | 50 - 100 | 0.8 - 3 | 32 - 8 |
| S | Titanium alloys (Ti-6Al-4V, etc.) | AH725 | 30 - 100 | 0.8 - 3 | 32 - 8 |
| S | Superalloys (Inconel718, etc.) | AH725 | 30 - 100 | 0.8 - 3 | 32 - 8 |

# **Multi-functional tool** reduces tool cost and shortens set-up time






### 1 CGEUR/L
Monoblock type
*W* = 3 - 6 mm
*ar* = 2.8 - 3.4 mm
Shank size:
16 - 25 mm
C063

### 2 CTEFR/L
Monoblock type
*W* = 2 - 6 mm
*ar* = 4.8 mm
Shank size:
20 - 25 mm
C057

### 3 CTFR/L
Monoblock type
*W* = 3 - 6 mm
*ar* = 10 - 25 mm
Shank size:
25 mm
C066

### 4 CTIR/L
Monoblock type
*W* = 2 - 8 mm
*ar* = 4 - 10 mm
Shank size:
ø16 - ø40 mm
C064

### 5 CTIFR/L
Monoblock type
*W* = 3 - 6 mm
*ar* = 5.5 mm
Shank size:
ø25 - ø32 mm
C071

### 6 CGIUR/L
Monoblock type
*W* = 3 - 6 mm
*ar* = 2.8 mm
Shank size:
ø20 - ø25 mm
C065

### 7 CTFVR/L
Monoblock type
*W* = 3 - 6 mm
*ar* = 10 - 20 mm
Shank size:
25 mm
C067

### 8 CAFR/L
Adaptor type
*W* = 3 - 6 mm
*ar* = 12 - 25 mm
Shank size:
20 - 32 mm
C068

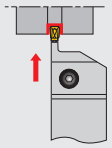
### 9 CTER/L
Monoblock type
*W* = 2 - 8 mm
*ar* = 8 - 36 mm
Shank size:
16 - 32 mm
C054

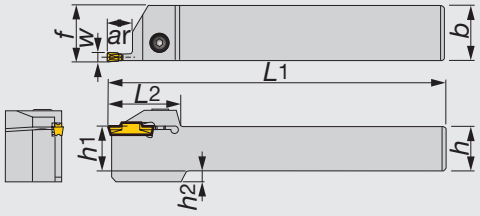
### 10 CAER/L
Adaptor type
*W* = 3 - 6 mm
*ar* = 16 - 20 mm
Shank size:
20 - 32 mm
C058

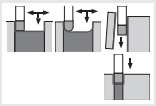
### 11 CGP
Blade type
*W* = 1.4 - 8 mm
Max. parting Dia.:
ø120 mm
Shank size:
ø20 - ø25 mm
C061

### 12 CGER/L
Monoblock type
*W* = 1.4 - 4 mm
*ar* = 10 - 16 mm
Shank size:
12 - 20 mm
C057

### 13 JCTER/L
Monoblock type
*W* = 1.4 - 3 mm
*ar* = 10 - 16 mm
Shank size:
10 - 20 mm
C056





Insert:
DGM, SGM, DGS, SGS, DGG, DTX, DTE, DTR, DTA, SGN

Right hand (R) shown.

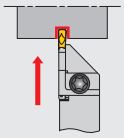
| Designation | W | Seat size | ar | h | b | $L_1$ | $L_2$ | $h_1$ | f(1) | $h_2$ |
|---|---|---|---|---|---|---|---|---|---|---|
| CTER/L1616-2T08 | 2 | 2 | 8 | 16 | 16 | 110 | 33 | 16 | 16.1 | 4 |
| CTER/L2020-2T08 | 2 | 2 | 8 | 20 | 20 | 125 | 33 | 20 | 20.1 | - |
| CTER/L2525-2T08 | 2 | 2 | 8 | 25 | 25 | 150 | 33 | 25 | 25.1 | - |
| CTER/L1616-2T12 | 2 | 2 | 12 | 16 | 16 | 110 | 32 | 16 | 16.1 | 4 |
| CTER/L2020-2T12 | 2 | 2 | 12 | 20 | 20 | 125 | 32 | 20 | 20.1 | - |
| CTER/L2525-2T12 | 2 | 2 | 12 | 25 | 25 | 150 | 32 | 25 | 25.1 | - |
| CTER/L1616-2T17 | 2 | 2 | 17 | 16 | 16 | 110 | 37 | 16 | 16.1 | 4 |
| CTER/L2020-2T17 | 2 | 2 | 17 | 20 | 20 | 125 | 37 | 20 | 20.1 | - |
| CTER/L2525-2T17 | 2 | 2 | 17 | 25 | 25 | 150 | 37 | 25 | 25.1 | - |
| CTER/L1616-3T09 | 3 | 3 | 9 | 16 | 16 | 110 | 32 | 16 | 16.3 | 4 |
| CTER/L2020-3T09 | 3 | 3 | 9 | 20 | 20 | 125 | 32 | 20 | 20.3 | - |
| CTER/L2525-3T09 | 3 | 3 | 9 | 25 | 25 | 150 | 32 | 25 | 25.3 | - |
| CTER/L2020-3T12 | 3 | 3 | 12 | 20 | 20 | 125 | 32 | 20 | 20.3 | - |
| CTER/L2525-3T12 | 3 | 3 | 12 | 25 | 25 | 150 | 32 | 25 | 25.3 | - |
| CTER/L1616-3T20 | 3 | 3 | 20 | 16 | 16 | 110 | 38.5 | 16 | 16.3 | 4 |
| CTER/L2020-3T20 | 3 | 3 | 20 | 20 | 20 | 125 | 38.5 | 20 | 20.3 | - |
| CTER/L2525-3T20 | 3 | 3 | 20 | 25 | 25 | 150 | 38.5 | 25 | 25.3 | - |
| CTER/L2525-3T25 | 3 | 3 | 25 | 25 | 25 | 150 | 44.5 | 25 | 25.3 | - |
| CTER/L1616-4T10 | 4 | 4 | 10 | 16 | 16 | 110 | 32 | 16 | 16.5 | 4 |
| CTER/L2020-4T10 | 4 | 4 | 10 | 20 | 20 | 125 | 32 | 20 | 20.5 | - |
| CTER/L2525-4T10 | 4 | 4 | 10 | 25 | 25 | 150 | 32 | 25 | 25.5 | - |
| CTER/L2020-4T15 | 4 | 4 | 15 | 20 | 20 | 125 | 33 | 20 | 20.5 | - |
| CTER/L2525-4T15 | 4 | 4 | 15 | 25 | 25 | 150 | 33 | 25 | 25.5 | - |
| CTER/L1616-4T25 | 4 | 4 | 25 | 16 | 16 | 110 | 45 | 16 | 16.5 | 4 |
| CTER/L2020-4T25 | 4 | 4 | 25 | 20 | 20 | 125 | 45 | 20 | 20.5 | - |
| CTER/L2525-4T25 | 4 | 4 | 25 | 25 | 25 | 150 | 45 | 25 | 25.5 | - |
| CTER/L3232-4T25 | 4 | 4 | 25 | 32 | 32 | 170 | 45 | 32 | 32.5 | - |
| CTER/L2020-5T12 | 5 | 5 | 12 | 20 | 20 | 125 | 37 | 20 | 20.6 | - |
| CTER/L2525-5T12 | 5 | 5 | 12 | 25 | 25 | 150 | 37 | 25 | 25.6 | - |
| CTER/L2525-5T20 | 5 | 5 | 20 | 25 | 25 | 150 | 37 | 25 | 25.6 | - |
| CTER/L2525-5T32 | 5 | 5 | 32 | 25 | 25 | 150 | 56 | 25 | 25.6 | - |
| CTER/L3232-5T32 | 5 | 5 | 32 | 32 | 32 | 170 | 56 | 32 | 32.6 | - |
| CTER/L2020-6T12 | 6 | 6 | 12 | 20 | 20 | 125 | 37 | 20 | 20.6 | - |
| CTER/L2525-6T12 | 6 | 6 | 12 | 25 | 25 | 150 | 37 | 25 | 25.6 | 7 |
| CTER/L2525-6T20 | 6 | 6 | 20 | 25 | 25 | 150 | 41 | 25 | 25.6 | - |
| CTER/L2525-6T32 | 6 | 6 | 32 | 25 | 25 | 150 | 56 | 25 | 25.6 | 7 |
| CTER/L3232-6T32 | 6 | 6 | 32 | 32 | 32 | 170 | 56 | 32 | 32.6 | - |
| CTER/L2525-8T16 | 8 | 8 | 16 | 25 | 25 | 150 | 47 | 25 | 26.1 | 7 |
| CTER/L2525-8T25 | 8 | 8 | 25 | 25 | 25 | 150 | 47 | 25 | 26.1 | 7 |
| CTER/L3232-8T25 | 8 | 8 | 25 | 32 | 32 | 170 | 47 | 32 | 33.1 | - |
| CTER/L2525-8T36 | 8 | 8 | 36 | 25 | 25 | 150 | 60 | 25 | 26.1 | 7 |
| CTER/L3232-8T36 | 8 | 8 | 36 | 32 | 32 | 170 | 60 | 32 | 33.1 | - |

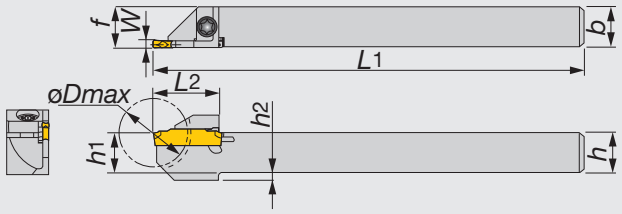
• When depth is deeper than (insert length - 1.5 mm), 1 corner type is recommended.
(1) "*f*" value is calculated with groove width "*W*" shown in the table.
• For Applicable insert, see page C073 - C085.

## SPARE PARTS




| Designation | Clamping screw | Wrench |
|---|---|---|
| CTER/L1616-2T08 | CM5X0.8X16-A | P-4 |
| CTER/L2020-2T08 | CM5X0.8X20-A | P-4 |
| CTELR/L2525-2T08 | CM5X0.8X25-A | P-4 |
| CTER/L1616-2T12 | CM5X0.8X16-A | P-4 |
| CTER/L2020-2T12 | CM5X0.8X20-A | P-4 |
| CTER/L2525-2T12 | CM5X0.8X25-A | P-4 |
| CTER/L1616-2T17 | CM5X0.8X16-A | P-4 |
| CTER/L2020-2T17 | CM5X0.8X20-A | P-4 |
| CTER/L2525-2T17 | CM5X0.8X25-A | P-4 |
| CTER/L1616-3T09 | CM5X0.8X16-A | P-4 |
| CTER/L2020-3T09 | CM5X0.8X20-A | P-4 |
| CTER/L2525-3T09 | CM5X0.8X25-A | P-4 |
| CTER/L2020-3T12 | CM5X0.8X20-A | P-4 |
| CTER/L2525-3T12 | CM5X0.8X25-A | P-4 |
| CTER/L1616-3T20 | CM5X0.8X16-A | P-4 |
| CTER/L2020-3T20 | CM5X0.8X20-A | P-4 |
| CTER/L2525-3T20.25 | CM5X0.8X25-A | P-4 |
| CTER/L1616-4T10 | CM6X1X16-A | P-5 |
| CTER/L2020-4T10 | CM6X1X20-A | P-5 |
| CTER/L2525-4T10 | CM6X1X25-A | P-5 |
| CTER/L2020-4T15 | CM6X1X20-A | P-5 |
| CTER/L2525-4T15 | CM6X1X25-A | P-5 |
| CTER/L1616-4T25 | CM6X1X16-A | P-5 |
| CTER/L2020-4T25 | CM6X1X20-A | P-5 |
| CTER/L2525-4T25 | CM6X1X25-A | P-5 |
| CTER/L3232-4T25 | CM6X1X25-A | P-5 |
| CTER/L2020-5T12 | CM6X1X20-A | P-5 |
| CTER/L2525-5T20 | CM6X1X25-A | P-5 |
| CTER/L2525, 3232-5T32 | CM6X1X25-A | P-5 |
| CTER/L2020-6T12 | CM8X1.25X20-A | P-6 |
| CTER/L2525-6T12 | CM8X1.25X25-A | P-6 |
| CTER/L2525-6T20 | CM8X1.25X25-A | P-6 |
| CTER/L2525, 3232-6T32 | CM8X1.25X25-A | P-6 |
| CTER/L2525-8T16 | CM8X1.25X25-A | P-6 |
| CTER/L2525, 3232-8T25 | CM8X1.25X25-A | P-6 |
| CTER/L2525, 3232-8T36 | CM8X1.25X25-A | P-6 |








Insert:
Seat size 1 = DGS1.4-016
Seat size 2, 3, = DGM, SGM, DGS, SGS, DGE, DTE, DGG

Right hand (R) shown.

| Designation | *W* | Seat size | *øDmax* | *h* | *b* | *L1* | *L2* | *h1* | *f*(1) | *h2* |
|---|---|---|---|---|---|---|---|---|---|---|
| JCTER/L1010X1.4T10 | 1.4 | 1 | 20 | 10 | 10 | 120 | 18 | 10 | 10.2 | - |
| JCTER/L1010-1.4T10 | 1.4 | 1 | 20 | 10 | 10 | 125 | 18 | 10 | 10.2 | - |
| JCTER/L1212F1.4T12 | 1.4 | 1 | 24 | 12 | 12 | 85 | 19.5 | 12 | 12.2 | - |
| JCTER/L1212X1.4T12 | 1.4 | 1 | 24 | 12 | 12 | 120 | 19.5 | 12 | 12.2 | - |
| JCTER/L1212-1.4T12 | 1.4 | 1 | 24 | 12 | 12 | 125 | 19.5 | 12 | 12.2 | - |
| JCTER/L1414-1.4T12 | 1.4 | 1 | 24 | 14 | 14 | 125 | 19.5 | 14 | 14.2 | - |
| JCTER/L1616X1.4T16 | 1.4 | 1 | 32 | 16 | 16 | 120 | 24 | 16 | 16.2 | - |
| JCTER/L1616-1.4T16 | 1.4 | 1 | 32 | 16 | 16 | 125 | 24 | 16. | 16.2 | - |
| JCTER/L1010X2T10 | 2 | 2 | 20 | 10 | 10 | 120 | 19 | 10 | 10.1 | 2 |
| JCTER/L1010-2T10 | 2 | 2 | 20 | 10 | 10 | 125 | 19 | 10 | 10.1 | 2 |
| JCTER/L1212F2T12 | 2 | 2 | 24 | 12 | 12 | 85 | 19 | 12 | 12.1 | 2 |
| JCTER/L1212X2T12 | 2 | 2 | 24 | 12 | 12 | 120 | 19 | 12 | 12.1 | 2 |
| JCTER/L1212-2T12 | 2 | 2 | 24 | 12 | 12 | 125 | 19 | 12 | 12.1 | 2 |
| JCTER/L1414-2T12 | 2 | 2 | 24 | 14 | 14 | 125 | 19 | 14 | 14.1 | - |
| JCTER/L1616X2T16 | 2 | 2 | 32 | 16 | 16 | 120 | 24 | 16 | 16.1 | - |
| JCTER/L1616-2T16 | 2 | 2 | 32 | 16 | 16 | 125 | 24 | 16 | 16.1 | - |
| JCTER/L1212F3T12 | 3 | 3 | 24 | 12 | 12 | 85 | 19 | 12 | 12.3 | 2 |
| JCTER/L1212X3T12 | 3 | 3 | 24 | 12 | 12 | 120 | 19 | 12 | 12.3 | 2 |
| JCTER/L1212-3T12 | 3 | 3 | 24 | 12 | 12 | 125 | 19 | 12 | 12.3 | 2 |
| JCTER/L1616X3T16 | 3 | 3 | 32 | 16 | 16 | 120 | 24 | 16 | 16.3 | - |
| JCTER/L1616-3T16 | 3 | 3 | 32 | 16 | 16 | 125 | 24 | 16 | 16.3 | - |
| JCTER/L2020H3T16 | 3 | 3 | 32 | 20 | 20 | 100 | 24 | 20 | 20.3 | - |
| JCTER/L2020-3T16 | 3 | 3 | 32 | 20 | 20 | 125 | 24 | 20 | 20.3 | - |

(1) "*f*" value is calculated with groove width "*W*" shown in the table. • *øD*max: Max. parting off dia.
• For Applicable insert, see page C073 - C085.

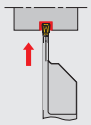
## SPARE PARTS

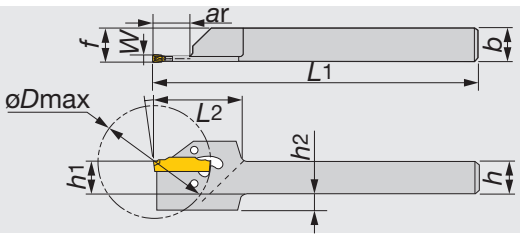




| Designation | Clamping screw | Wrench |
|---|---|---|
| JCTER/L... | CSHB-4-A | T-15F |

# TUNGCUT
## CGER/L
External deep grooving & parting toolholders for swiss lathes








Insert:
Seat size 1 = DGS1.4-016
Seat size 2, 3, 4, = DGM, SGM, DGS, SGS, SGN, DGG

Right hand (R) shown.

| Designation | W | Seat size | øDmax(1) | ar | h | b | L1 | L2 | h1 | f(2) | h2 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CGER/L2020-1.4T14 | 1.4 | 1 | 29/29 | 9.7 | 20 | 20 | 125 | 30 | 20 | 20.2 | - |
| CGER/L1212-2T17 | 2 | 2 | 35/35 | 11.8 | 12 | 12 | 150 | 30 | 12 | 12.1 | 6 |
| CGER/L1616-2T17 | 2 | 2 | 35/35 | 11.8 | 16 | 16 | 150 | 30 | 16 | 16.1 | 2 |
| CGER/L2020-2T17 | 2 | 2 | 35/35 | 9.8 | 20 | 20 | 125 | 30 | 20 | 20.1 | - |
| CGER/L1212-3T19 | 3 | 3 | 38/40 | 12 | 12 | 12 | 150 | 30 | 12 | 12.3 | 6 |
| CGER/L1616-3T19 | 3 | 3 | 38/45 | 14.9 | 16 | 16 | 150 | 30 | 16 | 16.3 | 2 |
| CGER/L2020-3T19 | 3 | 3 | 38/45 | 13.2 | 20 | 20 | 125 | 30 | 20 | 20.3 | - |
| CGER/L2020-4T19 | 4 | 4 | 38/55 | 20.3 | 20 | 20 | 125 | 32 | 20 | 20.4 | - |

• Wrench, CRW**, should be ordered separately. Insert is clamped by the elastic deformation of upper jaw. (1) DG*/SG* Maximum diameter of parting off Dmax defer by using the inserts. (2) "f" value is calculated with groove width "W" shown in the table. • øDmax: Max. parting off dia. • For Applicable insert, see page C073 - C085.

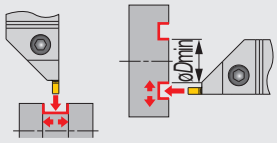
### SPARE PARTS

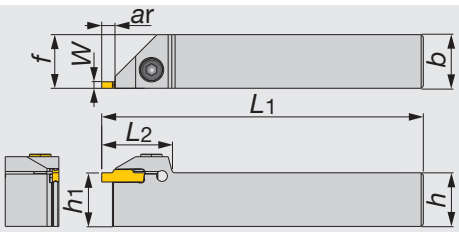


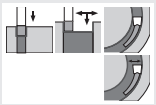
| Designation | Wrench |
|---|---|
| CGER/L2020-1.4T14 | CRW23 |
| CGER/L****-2T17 - 4T19 | CRW33 |



# TUNGCUT
## CTEFR/L
Toolholders for External / Face grooving & turning



Insert:
DGM, SGM, DGS, SGS, DTE, DGG, DTX, DTR, DTF, SGN

Right hand (R) shown.

| Designation | W | Seat size | ar | h1 | b | h | L1 | f1 | L2 |
|---|---|---|---|---|---|---|---|---|---|
| CTEFR/L2020-4T04 | 4 | 2, 3, 4 | 4.8 | 20 | 20 | 20 | 125 | 20.5 | 33 |
| CTEFR/L2525-4T04 | 4 | 2, 3, 4 | 4.8 | 25 | 25 | 25 | 150 | 25.5 | 33 |
| CTEFR/L2020-6T04 | 6 | 5, 6 | 4.8 | 20 | 20 | 20 | 125 | 20.6 | 37 |
| CTEFR/L2525-6T04 | 6 | 5, 6 | 4.8 | 25 | 25 | 25 | 150 | 25.6 | 37 |

(1) "f" value is calculated with groove width "W" shown in the table. • For Applicable insert, see page C073 - C085.

### SPARE PARTS





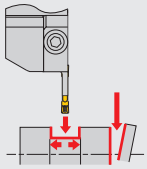
| Designation | Clamping screw | Wrench |
|---|---|---|
| CTEFR/L2020-4T04 | CM6X1X20-A | P-5 |
| CTEFR/L2525-4T04 | CM6X1X25-A | P-5 |
| CTEFR/L2020-6T04 | CM6X1X20-A | P-5 |
| CTEFR/L2525-6T04 | CM6X1X25-A | P-5 |

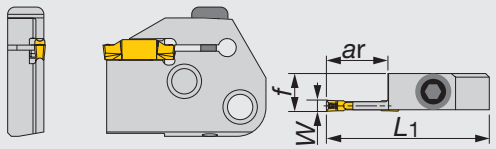
| Insert | Groove width W | Min. dia. for face grooving øDmin |
|---|---|---|
| DGM / DGS / SGN | 2 | 295 |
| DGM / DGS / SGN | 3 | 92 |
| DGM / DGS / SGN | 4 | 37 |
| DGM / DGS | 5 | 60 |
| DGM / DGS | 6 | 57 |
| DTE / DGG | 3 | 62 |
| DTE / DGG | 4 | 42 |
| DTE / DGG | 5 | 64 |
| DTE / DGG | 6 | 61 |

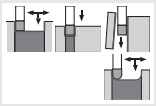
| Insert | Groove width W | Min. dia. for face grooving øDmin |
|---|---|---|
| DTR | 3 | 44 |
| DTR | 4 | 32 |
| DTR | 5 | 48 |
| DTR | 6 | 48 |
| DTX | 3 | 19 |
| DTX | 4 | 20 |
| DTX | 5 | 20 |
| DTX | 6 | 23 |
| DTF | 3 | 19 |
| DTF | 4 | 20 |

## CAER/L

Blades for external grooving & turning





Insert:
DGS, SGS, DGM,
SGM, DTX, DTE,
DGG, DTR, SGN

Right hand (R) shown.

| Designation | W | Seat size | ar | $L_1$ | f | Shank |
|---|---|---|---|---|---|---|
| CAER/L-3T16 | 3 | 3 | 16 | 45 | 10.4 | CHFVL/R...,CHSR/L... |
| CAER/L-4T16 | 4 | 4 | 16 | 45 | 10.5 | CHFVL/R...,CHSR/L... |
| CAER/L-5T20 | 5 | 5 | 20 | 49 | 10.5 | CHFVL/R...,CHSR/L... |
| CAER/L-6T20 | 6 | 6 | 20 | 49 | 10.5 | CHFVL/R...,CHSR/L... |

• For Applicable insert, see page C073 - C085.

### SPARE PARTS

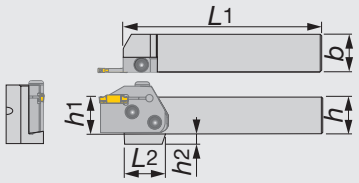
| Designation | Clamping screw | Wrench |
|---|---|---|
| CAER/L... | BHM6-20-A | P-4 |





## CHSR/L

Shank of toolholders for CAER/L & CAFR/L blades




Right hand (R) shown.

| Designation | h | b | $L_1$ | $L_2$ | $h_1$ | $h_2$ | Blade |
|---|---|---|---|---|---|---|---|
| CHSR/L2020 | 20 | 20 | 133 | 35 | 20 | 12 | CAER/L...,CAFL/R... |
| CHSR/L2525 | 25 | 25 | 133 | 28 | 25 | 7 | CAER/L...,CAFL/R... |
| CHSR/L3232 | 32 | 32 | 153 | 28 | 32 | - | CAER/L...,CAFL/R... |

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| CHSR/L... | CSHB-6-A | P-4 |

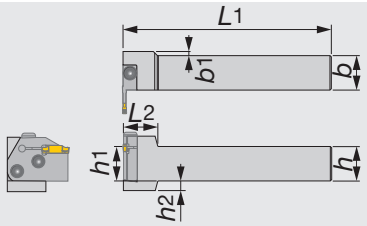
### Combination of blade and toolholder

| Toolholders | Blade | | | |
|---|---|---|---|---|
| | CAER... | CAEL... | CAFR... | CAFL... |
| CHSR... | ● | | | ● |
| CHSL... | | ● | ● | |

● : Correspondence

# CHFVR/L

Shank of perpendicular toolholders for CAER/L & CAFR/L blades




Right hand (R) shown.

| Designation | *h* | *b* | $L_1$ | $L_2$ | $h_1$ | $h_2$ | $b_1$ | Blade |
|---|---|---|---|---|---|---|---|---|
| CHFVR/L2020 | 20 | 20 | 150 | 25 | 20 | 12 | 8 | CAEL/R...,CAFR/L... |
| CHFVR/L2525 | 25 | 25 | 150 | 25 | 25 | 7 | 3 | CAEL/R...,CAFR/L... |
| CHFVR/L3232 | 32 | 32 | 170 | 25 | 32 | - | - | CAEL/R...,CAFR/L... |

## SPARE PARTS




| Designation | Clamping screw | Wrench |
|---|---|---|
| CHFVR/L... | CSHB-6-A | P-4 |

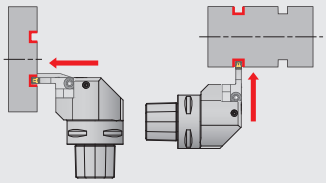
## Combination of blade and toolholder

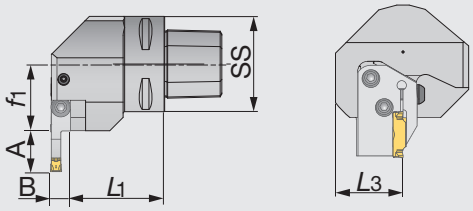
| Toolholders | Blade | | | |
|---|---|---|---|---|
| | CAER... | CAEL... | CAFR... | CAFL... |
| CHFVR... | | ● | ● | |
| CHFVL... | ● | | | ● |

● : Correspondence

## C-CHFVR/L

TungCut shank of perpendicular toolholders for CAER/L & CAFR/L blades






Right hand (R) shown.

| Designation | SS | $L_1$ | $L_3$ | $f_1$ |
|---|---|---|---|---|
| C4CHFVR/L27050N | 40 | 42.5 | 36 | 27 |
| C5CHFVR/L35060N | 50 | 49.5 | 36 | 35 |
| C6CHFVR/L45065 | 63 | 54.5 | 41 | 45 |
| C6CHFVR/L45065N | 63 | 54.5 | 41 | 45 |

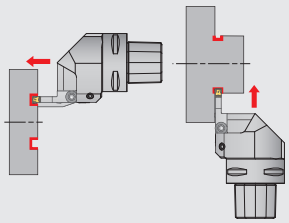
• The last character of designation is "N": Capable for 7 Mpa coolant pressure.

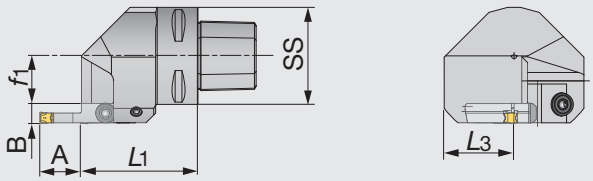
### SPARE PARTS

| Designation | Coolant parts | Coolant parts 1 | Plug | Clamping screw | Wrench |
|---|---|---|---|---|---|
| C4CHFVR/L27050N | SATZ-M8X1-M3 | - | SSHM4-4 | CSHB-6-A | P-4 |
| C5CHFVR/L35060N | SATZ-M10X1-M5 | - | SSHM4-4 | CSHB-6-A | P-4 |
| C6CHFVR/L45065 | CNZ125 | PNZ5 | - | CSHB-6-A | P-4 |
| C6CHFVR/L45065N | SATZ-M10X1-M5 | - | SSHM4-4 | CSHB-6-A | P-4 |

## C-CHSR/L

TungCut shank of toolholders for CAER/L & CAFR/L blades






Right hand (R) shown.

| Designation | SS | $L_1$ | $L_3$ | $f_1$ |
|---|---|---|---|---|
| C4CHSR/L27050N | 40 | 50 | 36 | 16.5 |
| C5CHSR/L35060 | 50 | 60 | 36 | 24.5 |
| C5CHSR/L35060N | 50 | 60 | 36 | 24.5 |
| C6CHSR/L45065N | 63 | 65 | 41 | 34.5 |

• The last character of designation is "N": Capable for 7 Mpa coolant pressure.

### SPARE PARTS

| Designation | Coolant parts | Coolant parts 1 | Plug | Clamping screw | Wrench |
|---|---|---|---|---|---|
| C4CHSR/L27050N | SATZ-M8X1-M3 | - | SSHM4-4 | CSHB-6-A | P-4 |
| C5CHSR/L35060 | CNZ125 | PNZ5 | - | CSHB-6-A | P-4 |
| C5CHSR/L35060N | SATZ-M10X1-M5 | - | SSHM4-4 | CSHB-6-A | P-4 |
| C6CHSR/L45065N | SATE-M10X1-M5 | - | SSHM4-4 | CSHB-6-A | P-4 |

### Combination of blade and toolholder

| Toolholders | Blade | | | |
|---|---|---|---|---|
| | CAER... | CAEL... | CAFR... | CAFL... |
| C*CHFVR... | | ● | ● | |
| C*CHFVL... | ● | | | ● |
| C*CHSR... | ● | | | ● |
| C*CHSL... | | ● | ● | |

● : Correspondence

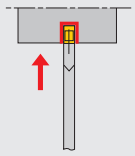


Fig.1

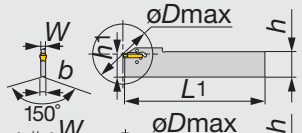



Fig.2

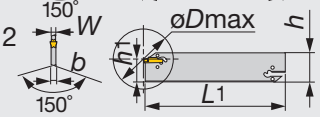
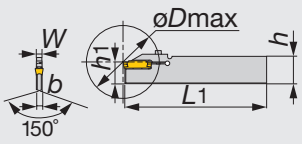



Fig.3






Insert:
Seat size 1:DGS1.4-016
Seat size 2-6:SGM, SGS, DGM, DGS, DTX, DGG
Seat size 8:DGM8, 040

| Designation | *W* | Seat size | ø*D*max | *h*1 | *b* | *h* | *L*1 | Fig |
|---|---|---|---|---|---|---|---|---|
| CGP26-1.4S | 1.4 | 1 | 26 | 21.4 | 1 | 26 | 150 | 1 |
| CGP32-1.4D | 1.4 | 1 | 26 | 24.8 | 1 | 32 | 150 | 2 |
| CGP26-2S | 2 | 2 | 40 | 21.4 | 1.8 | 26 | 150 | 1 |
| CGP32-2D | 2 | 2 | 50 | 24.8 | 1.8 | 32 | 150 | 2 |
| CGP26-3S | 3 | 3 | 50 | 21.4 | 2.4 | 26 | 150 | 1 |
| CGP32-3D | 3 | 3 | 100 | 24.8 | 2.4 | 32 | 150 | 2 |
| CGP26-4S | 4 | 4 | 80 | 21.4 | 3.2 | 26 | 150 | 1 |
| CGP32-4D | 4 | 4 | 100 | 24.9 | 3.2 | 32 | 150 | 2 |
| CGP45-4D | 4 | 4 | 120 | 38.1 | 3.2 | 45 | 150 | 2 |
| CGP32-5D | 5 | 5 | 120 | 24.9 | 4 | 32 | 150 | 2 |
| CGP32-6D | 6 | 6 | 120 | 24.9 | 5.2 | 32 | 150 | 2 |
| CGP32-8S-CL | 8 | 8 | 80 | 24.9 | 6.2 | 32 | 150 | 3 |

- When depth is deeper than (insert length - 1.5 mm), 1 corner type is recommended. • Wrench (CRW**) should be ordered separately.
- Max groove depth is 28.5 mm.
- ø*D*max: Max. parting off dia.
- For Applicable insert, see page C073 - C085.

**SPARE PARTS**



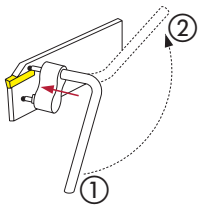


| Designation | Clamping screw | Wrench |
|---|---|---|
| CGP**-1.4* | - | CRW23 |
| CGP**-2/3/4/5/6 | - | CRW33 |
| CGP32-8S-CL | CM4X0.7X20-M0-A | P-3 |

## Caution

### Newly developed wrench

Insert is clamped by the elastic deformation of upper jaw.
Low clamping stress increases the stability and tool life.



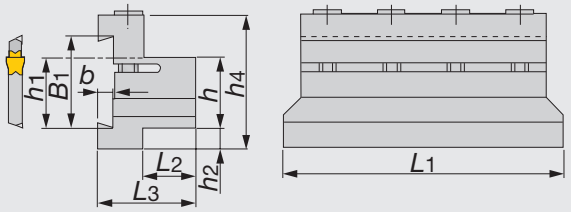



①→②: unclamp
②→①: clamp

TUNGCUT

## CTBF

Tool block for CGP blades(fixed clamp)




Right hand (R) shown.

| Designation | *h* | $B_1$ | $L_2$ | $L_1$ | *b* | $h_1$ | $h_2$ | $h_4$ | $L_3$ | Blade |
|---|---|---|---|---|---|---|---|---|---|---|
| CTBF25-45 | 25 | 45 | 22 | 110 | 5.5 | 38.1 | 25 | 66 | 40 | CGP45... |
| CTBF32-45 | 32 | 45 | 28 | 120 | 5.5 | 38.1 | 18 | 66 | 45 | CGP45... |

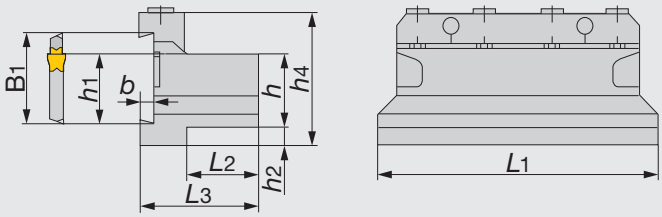
### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| CTBF... | CM6X1.0X40-A | P-5 |

TUNGCUT

## CTBU

Tool block for CGP and EGP blades




Right hand (R) shown.

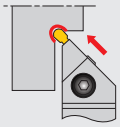
| Designation | $h_1$ | *b* | $B_1$ | $L_1$ | *h* | $h_2$ | $h_4$ | $L_2$ | $L_3$ | Blade |
|---|---|---|---|---|---|---|---|---|---|---|
| CTBU20-26 | 21.4 | 4 | 26 | 86 | 20 | 9 | 43 | 21 | 38 | CGP26... |
| CTBU25-26 | 21.4 | 4 | 26 | 110 | 25 | 5 | 45 | 23 | 42 | CGP26... |
| CTBU20-32 | 24.8 | 5.3 | 32 | 100 | 20 | 13 | 50 | 19 | 38 | CGP32... |
| CTBU25-32 | 24.8 | 5.3 | 32 | 110 | 25 | 8 | 50 | 23 | 42 | CGP32... |
| CTBU32-32 | 24.8 | 5.3 | 32 | 110 | 32 | 5 | 54 | 29 | 48 | CGP32... |

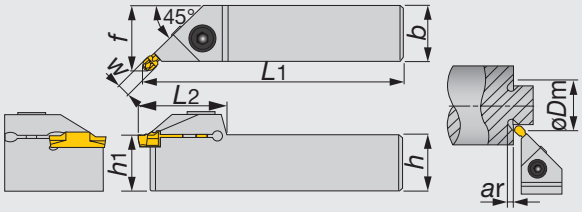
### SPARE PARTS

| Designation | Clamp | Clamping screw | Wrench |
|---|---|---|---|
| CTBU20-26 | CT-86 | CM6X30-S | P-5 |
| CTBU25-26 | CT-105 | CM6X30-S | P-5 |
| CTBU20-32 | CT-100 | CM6X30-S | P-5 |
| CTBU25-32 | CT-110 | CM6X30-S | P-5 |
| CTBU32-32 | CT-110 | CM6X30-S | P-5 |

# CGEUR/L

## External 45° toolholders for undercutting






Right hand (R) shown.

| Designation | W | øDm | Seat size | ar | h | b | L1 | L2 | h1 | f (1) | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CGEUR/L1616-3T02 | 3 | 32 | 3 | 2.8 | 16 | 16 | 110 | 30 | 16 | 19.3 | DTIU... |
| CGEUR/L2020-3T02 | 3 | 32 | 3 | 2.8 | 20 | 20 | 125 | 30 | 20 | 23.3 | DTIU... |
| CGEUR/L2525-3T02 | 3 | 32 | 3 | 2.8 | 25 | 25 | 150 | 30 | 25 | 28.3 | DTIU... |
| CGEUR/L1616-4T02 | 4 | 32 | 4 | 2.8 | 16 | 16 | 110 | 31 | 16 | 19.5 | DTIU... |
| CGEUR/L2020-4T02 | 4 | 32 | 4 | 2.8 | 20 | 20 | 125 | 31 | 20 | 23.5 | DTIU... |
| CGEUR/L2525-4T02 | 4 | 32 | 4 | 2.8 | 25 | 25 | 150 | 31 | 25 | 28.5 | DTIU... |
| CGEUR/L2525-6T03 | 6 | 34 | 5, 6 | 3.4 | 25 | 25 | 150 | 35 | 25 | 28.9 | DTIU... |

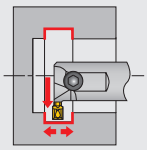
(1) "*f*" value is calculated with groove width "*W*" shown in the table.
• For Applicable insert, see page C073 - C085.

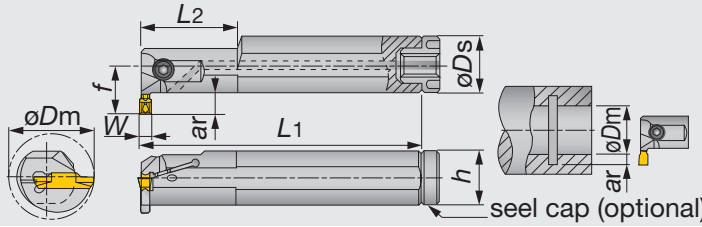
### SPARE PARTS





| Designation | Clamping screw | Wrench |
|---|---|---|
| CGEUR/L****-3T02 | CM5X0.8X16-A | P-4 |
| CGEUR/L1616-4T02 | CM6X1X16-A | P-5 |
| CGEUR/L2020-4T02 | CM6X1X20-A | P-5 |
| CGEUR/L2525-4T02/6T03 | CM6X1X25-A | P-5 |






Insert:
Seat size 2:DGIM, DGIS
Seat size 3-8:DTI, DTX

Right hand (R) shown.

| Designation | *W* | *ø$D_m$* | Seat size | *ar* | *ø$D_s$* | *f* | *$L_1$* | *$L_2$* | *h* | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| CTIR/L16-2T08-D250 | 2 | 25 | 2 | 8 | 16 | 16.5 | 125 | - | 14 | DGIM..., DGIS... |
| CTIR/L20-2T06-D250 | 2 | 25 | 2 | 6 | 20 | 15.8 | 160 | - | 18 | DGIM..., DGIS... |
| CTIR/L20-3T06-D250 | 3 | 25 | 3 | 6 | 20 | 15.8 | 160 | 40 | 18 | DTI..., DTX... |
| CTIR/L25-3T05-D250 | 3 | 25 | 3 | 5.1 | 25 | 17.5 | 200 | 40 | 23 | DTI..., DTX... |
| CTIR/L25-3T08-D320 | 3 | 32 | 3 | 8 | 25 | 21.5 | 200 | 40 | 23 | DTI..., DTX... |
| CTIR/L32-3T10-D400 | 3 | 40 | 3 | 10 | 32 | 27 | 250 | 60 | 30 | DTI..., DTX... |
| CTIR/L20-4T06-D250 | 4 | 25 | 4 | 6 | 20 | 15.8 | 160 | 40 | 18 | DTI..., DTX... |
| CTIR/L25-4T08-D320 | 4 | 32 | 4 | 8 | 25 | 21.5 | 200 | 40 | 23 | DTI..., DTX... |
| CTIR/L32-4T04-D310 | 4 | 31 | 4 | 4 | 32 | 20.8 | 250 | 60 | 30 | DTI..., DTX... |
| CTIR/L32-4T10-D400 | 4 | 40 | 4 | 10 | 32 | 27 | 250 | 60 | 30 | DTI..., DTX... |
| CTIR/L25-5T05-D310 | 5 | 31 | 5 | 5 | 25 | 17.3 | 200 | 60 | 23 | DTI..., DTX... |
| CTIR/L32-5T10-D400 | 5 | 40 | 5 | 10 | 32 | 27 | 250 | 60 | 30 | DTI..., DTX... |
| CTIR/L32-6T04-D310 | 6 | 31 | 6 | 4 | 32 | 20.8 | 250 | 60 | 30 | DTI..., DTX... |
| CTIR/L32-6T10-D400 | 6 | 40 | 6 | 10 | 32 | 27 | 250 | 60 | 30 | DTI..., DTX... |
| CTIR/L32-8T05-D370 | 8 | 37 | 8 | 5 | 32 | 21.3 | 250 | 60 | 30 | DTI..., DTX... |
| CTIR/L40-8T05-D420 | 8 | 42 | 8 | 5.8 | 40 | 25.8 | 300 | 65 | 38 | DTI..., DTX... |

(1) "*L*1" value is calculated with groove width "*W*" shown in the table.
• For applicable Insert, see page C073 - C085.

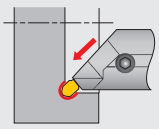
## SPARE PARTS

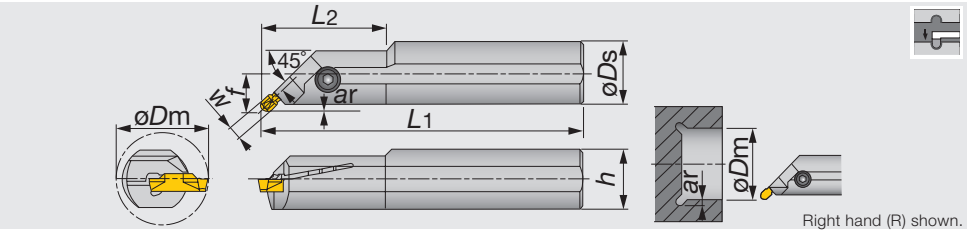


| Designation | Clamping screw | Wrench | Seal cap | Thread type tor connection |
|---|---|---|---|---|
| CTIR/L16-2T08-D250 | CM5X0.8X10-A | P-4 | CA-16 | M6 |
| CTIR/L20-2T06-D250 | CM5X0.8X12-A | P-4 | CA-20 | M6 |
| CTIR/L20-3T06-D250 | CM5X0.8X12-A | P-4 | CA-20 | M6 |
| CTIR/L25-3T05-D250 | CM5X0.8X16-A | P-4 | CA-25 | R1/8" |
| CTIR/L25-3T08-D320 | CM5X0.8X16-A | P-4 | CA-25 | R1/8" |
| CTIR/L32-3T10-D400 | CM5X0.8X16-A | P-4 | CA-32 | R1/8" |
| CTIR/L20-4T06-D250 | CM5X0.8X12-A | P-4 | CA-20 | M6 |
| CTIR/L25-4T08-D320 | CM5X0.8X16-A | P-4 | CA-25 | R1/8" |
| CTIR/L32-4T04-D310 | CM5X0.8X16-A | P-4 | CA-32 | R1/8" |
| CTIR/L32-4T10-D400 | CM5X0.8X16-A | P-4 | CA-32 | R1/8" |
| CTIR/L25-5T05-D310 | CM6X1X16-A | P-5 | CA-25 | R1/8" |
| CTIR/L32-5T10-D400 | CM6X1X20-A | P-5 | CA-32 | R1/8" |
| CTIR/L32-6T04-D310 | CM6X1X20-A | P-5 | CA-32 | R1/8" |
| CTIR/L32-6T10-D400 | CM6X1X20-A | P-5 | CA-32 | R1/8" |
| CTIR/L32-8T05-D370 | CM6X1X25-A | P-5 | CA-32 | R1/8" |
| CTIR/L40-8T05-D420 | CM6X1X25-A | P-5 | CA-40 | R1/8" |

# CGIUR/L

## Boring bars for internal undercutting






Right hand (R) shown.

| Designation | W | øDm | Seat size | ar | øDs | f (1) | L1 | L2 | h | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| CGIUR/L20-3T02-D380 | 3 | 38 | 3 | 2.8 | 20 | 12.8 | 160 | - | 19 | DTIU... |
| CGIUR/L25-3T02-D380 | 3 | 38 | 3 | 2.8 | 25 | 14.8 | 200 | 40 | 23 | DTIU... |
| CGIUR/L20-4T02-D380 | 4 | 38 | 4 | 2.8 | 20 | 12.9 | 160 | - | 19 | DTIU... |
| CGIUR/L25-4T02-D460 | 4 | 46 | 4 | 2.8 | 25 | 14.9 | 200 | 40 | 23 | DTIU... |
| CGIUR/L25-6T02-D460 | 6 | 46 | 5, 6 | 2.8 | 25 | 15.2 | 200 | - | 23 | DTIU... |

(1) "*f*" value is calculated with groove width "*W*" shown in the table.

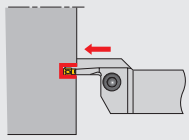
• For applicable Insert, see page C073 - C085.

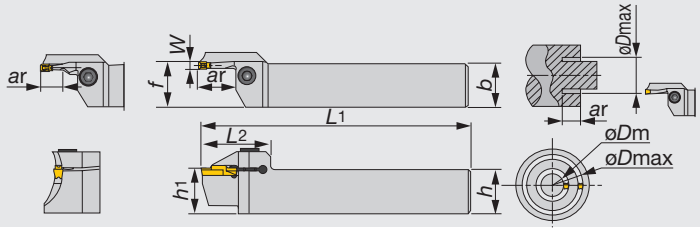
### SPARE PARTS





| Designation | Clamping screw | Wrench |
|---|---|---|
| CGIUR/L20-3T02-D380 | CM5X0.8X12-A | P-4 |
| CGIUR/L25-3T02-D380 | CM5X0.8X16-A | P-4 |
| CGIUR/L**-4T02-D... | CM5X0.8X16-A | P-4 |
| CGIUR/L25-6T02-D460 | CM6X1X25-A | P-5 |






Right hand (R) shown.

| Designation | *W* | ø*D*m | ø*D*max | Seat size | *ar* | *h* | *b* | *L*1 | *L*2 | *h*1 | *f*(1) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CTFR/L2525-3T10-024035 | 3 | 24 | 35 | 3 | 10 | 25 | 25 | 150 | 38 | 25 | 25.5 |
| CTFR/L2525-3T10-029040 | 3 | 29 | 40 | 3 | 10 | 25 | 25 | 150 | 38 | 25 | 25.5 |
| CTFR/L2525-3T10-034050 | 3 | 34 | 50 | 3 | 10 | 25 | 25 | 150 | 38 | 25 | 25.5 |
| CTFR/L2525-3T15-044070 | 3 | 44 | 70 | 3 | 15 | 25 | 25 | 150 | 38 | 25 | 25.5 |
| CTFR/L2525-3T15-064100 | 3 | 64 | 100 | 3 | 15 | 25 | 25 | 150 | 38 | 25 | 25.5 |
| CTFR/L2525-4T10-022036 | 4 | 22 | 36 | 4 | 10 | 25 | 25 | 150 | 39 | 25 | 25.6 |
| CTFR/L2525-4T20-028042 | 4 | 28 | 42 | 4 | 20 | 25 | 25 | 150 | 39 | 25 | 25.6 |
| CTFR/L2525-4T20-034050 | 4 | 34 | 50 | 4 | 20 | 25 | 25 | 150 | 39 | 25 | 25.6 |
| CTFR/L2525-4T20-042070 | 4 | 42 | 70 | 4 | 20 | 25 | 25 | 150 | 39 | 25 | 25.6 |
| CTFR/L2525-4T20-062120 | 4 | 62 | 120 | 4 | 20 | 25 | 25 | 150 | 39 | 25 | 25.6 |
| CTFR/L2525-4T20-112200 | 4 | 112 | 200 | 4 | 20 | 25 | 25 | 150 | 39 | 25 | 25.6 |
| CTFR/L2525-5T25-050080 | 5 | 50 | 80 | 5 | 25 | 25 | 25 | 150 | 49 | 25 | 25.6 |
| CTFR/L2525-5T25-070110 | 5 | 70 | 110 | 5 | 25 | 25 | 25 | 150 | 49 | 25 | 25.6 |
| CTFR/L2525-5T25-100150 | 5 | 100 | 150 | 5 | 25 | 25 | 25 | 150 | 49 | 25 | 25.6 |
| CTFR/L2525-5T25-140200 | 5 | 140 | 200 | 5 | 25 | 25 | 25 | 150 | 49 | 25 | 25.6 |
| CTFR/L2525-6T25-048070 | 6 | 48 | 70 | 6 | 25 | 25 | 25 | 150 | 49 | 25 | 25.6 |
| CTFR/L2525-6T25-058100 | 6 | 58 | 100 | 6 | 25 | 25 | 25 | 150 | 49 | 25 | 25.6 |
| CTFR/L2525-6T25-088180 | 6 | 88 | 180 | 6 | 25 | 25 | 25 | 150 | 49 | 25 | 25.6 |
| CTFR/L2525-6T25-168400 | 6 | 168 | 400 | 6 | 25 | 25 | 25 | 150 | 49 | 25 | 25.6 |

• When depth is deeper than (insert length - 1.5 mm), 1 corner type is recommended.
(1) "*f*" value is calculated with groove width "*W*" shown in the table.
• When DTF insert is installed, Max "ar" should be 15 mm.
• For applicable Insert, see page C073 - C085.

## SPARE PARTS



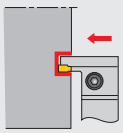

| Designation | Clamping screw | Wrench |
|---|---|---|
| CTFR/L2525-3T - 4T... | CM6X1X25-A | P-5 |
| CTFR/L2525-5T - 6T... | CM8X1.25X25-A | P-6 |

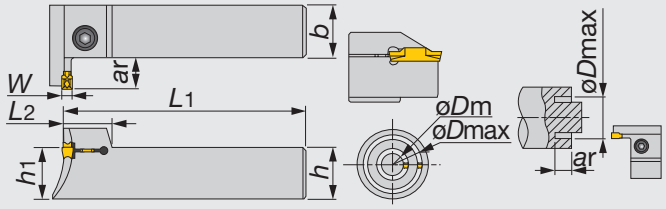
## INSERT

| Designation | Insert seat size | Insert |
|---|---|---|
| CTFR/L2525-3T10-024035 | 3 | DTF, DTX |
| CTFR/L2525-3T10-029040 | 3 | DTF, DTX |
| CTFR/L2525-3T10-034050 | 3 | DTF, DTX |
| CTFR/L2525-3T15-044070 | 3 | DTF, DTX, DTE, DTR |
| CTFR/L2525-3T15-064100 | 3 | DTF, DTX, DTE, DGG, DGM, DGS, DTR |
| CTFR/L2525-4T10-022036 | 4 | DTF, DTX |
| CTFR/L2525-4T20-028042 | 4 | DTF, DTX |
| CTFR/L2525-4T20-034050 | 4 | DTF, DTX |
| CTFR/L2525-4T20-042070 | 4 | DTF, DTX, DTE, DGG, DGM, DGS, DTR |
| CTFR/L2525-4T20-062120 | 4 | DTF, DTX, DTE, DGG, DGM, DGS, DTR |
| CTFR/L2525-4T20-112200 | 4 | DTF, DTX, DTE, DGG, DGM, DGS, DTR |
| CTFR/L2525-5T25-... | 5 | DTX, DTE, DGG, DGM, DGS, DTR |
| CTFR/L2525-6T25-... | 6 | DTX, DTE, DGG, DGM, DGS, DTR |

# CTFVR/L

## Perpendicular toolholders for face grooving and turning






Right hand (R) shown.

| Designation | W | øDm | øDmax | Seat size | ar | h | b | L1 | L2 | h1 |
|---|---|---|---|---|---|---|---|---|---|---|
| CTFVR/L2525-3T10-024035 | 3 | 24 | 35 | 3 | 10 | 25 | 25 | 150 | 18 | 25 |
| CTFVR/L2525-3T10-029040 | 3 | 29 | 40 | 3 | 10 | 25 | 25 | 150 | 18 | 25 |
| CTFVR/L2525-3T10-034050 | 3 | 34 | 50 | 3 | 10 | 25 | 25 | 150 | 18 | 25 |
| CTFVR/L2525-3T15-044060 | 3 | 44 | 60 | 3 | 15 | 25 | 25 | 150 | 18 | 25 |
| CTFVR/L2525-3T15-054085 | 3 | 54 | 85 | 3 | 15 | 25 | 25 | 150 | 18 | 25 |
| CTFVR/L2525-4T12-022040 | 4 | 22 | 40 | 4 | 12 | 25 | 25 | 150 | 18.5 | 25 |
| CTFVR/L2525-4T15-032050 | 4 | 32 | 50 | 4 | 15 | 25 | 25 | 150 | 18.5 | 25 |
| CTFVR/L2525-4T15-042060 | 4 | 42 | 60 | 4 | 15 | 25 | 25 | 150 | 18.5 | 25 |
| CTFVR/L2525-4T15-052085 | 4 | 52 | 85 | 4 | 15 | 25 | 25 | 150 | 18.5 | 25 |
| CTFVR/L2525-5T20-050080 | 5 | 50 | 80 | 5 | 20 | 25 | 25 | 150 | 22 | 25 |
| CTFVR/L2525-5T20-070110 | 5 | 70 | 110 | 5 | 20 | 25 | 25 | 150 | 22 | 25 |
| CTFVR/L2525-5T20-100150 | 5 | 100 | 150 | 5 | 20 | 25 | 25 | 150 | 22 | 25 |
| CTFVR/L2525-5T20-140200 | 5 | 140 | 200 | 5 | 20 | 25 | 25 | 150 | 22 | 25 |
| CTFVR/L2525-6T20-048085 | 6 | 48 | 85 | 6 | 20 | 25 | 25 | 150 | 22 | 25 |
| CTFVR/L2525-6T20-073150 | 6 | 73 | 150 | 6 | 20 | 25. | 25 | 150 | 22 | 25 |
| CTFVR/L2525-6T20-138250 | 6 | 138 | 250 | 6 | 20 | 25 | 25 | 150 | 22 | 25 |

- When depth is deeper than (insert length - 1.5 mm), 1 corner type is recommended.
- For applicable Insert, see page C073 - C085.

### SPARE PARTS





| Designation | Clamping screw | Wrench |
|---|---|---|
| CTFVR/L2525-3T... | CM5X0.8X25-A | P-4 |
| CTFVR/L2525-4T... | CM6X1X25-A | P-5 |
| CTFVR/L2525-5T..., 6T... | CM8X1.25X25-A | P-6 |

### INSERT

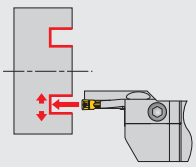
| Designation | Insert seat size | Insert |
|---|---|---|
| CTFVR/L2525-3T10-024035 | 3 | DTF, DTX |
| CTFVR/L2525-3T10-029040 | 3 | DTF, DTX |
| CTFVR/L2525-3T10-034050 | 3 | DTF, DTX, DTR |
| CTFVR/L2525-3T15-044060 | 3 | DTF, DTX, DTE, DTR |
| CTFVR/L2525-3T15-054085 | 3 | DTF, DTX, DTE, DGG, DGM, DGS, DTR |
| CTFVR/L2525-4T12-022040 | 4 | DTF, DTX |
| CTFVR/L2525-4T15-032050 | 4 | DTF, DTX |
| CTFVR/L2525-4T15-042060 | 4 | DTF, DTX, DTE, DGG, DGM, DGS, DTR |
| CTFVR/L2525-4T15-052085 | 4 | DTF, DTX, DTE, DGG, DGM, DGS, DTR |
| CTFVR/L2525-5T20-... | 5 | DTX, DTE, DGG, DGM, DGS, DTR |
| CTFVR/L2525-6T20-... | 6 | DTX, DTE, DGG, DGM, DGS, DTR |

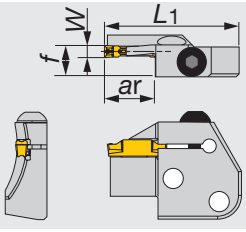
(1) Min. diameter ø*D*m of DTE, DGS and DGM insert

| Insert | øDm | Note |
|---|---|---|
| DTE3 / DGS3 / DGM3 | ø92 | When diameter is smaller than ø*D*m, DTF or DTX type insert is recommended. |
| DTE4 / DGS4 / DGM4 | ø42 | |

# CAFR/L

## Blades for face grooving & turning








Insert:
CAFR/L-3T12-040055:DTF
Seat size 3(2)-6:DTF(3), DTE, DGG, DTX, DGS, DGM, DTR
Shank:
CHFVR/L, CHSR/L
Right hand (R) shown.

| Designation | *W* | ø*D*m | ø*D*max | Seat size | *ar* | *L*1 | *f*(1) |
|---|---|---|---|---|---|---|---|
| CAFR/L-3T12-040055 | 3 | 40 | 55 | 3 | 12 | 45 | 10.4 |
| CAFR/L-3T12-055075 | 3 | 55 | 75 | 3 | 12 | 45 | 10.4 |
| CAFR/L-3T12-075100 | 3 | 75 | 100 | 3 | 12 | 45 | 10.4 |
| CAFR/L-3T12-100140 | 3 | 100 | 140 | 3 | 12 | 45 | 10.4 |
| CAFR/L-3T12-140200 | 3 | 140 | 200 | 3 | 12 | 45 | 10.4 |
| CAFR/L-4T16-050070 | 4 | 50 | 70 | 4 | 16 | 45 | 10.5 |
| CAFR/L-4T16-070100 | 4 | 70 | 100 | 4 | 16 | 45 | 10.5 |
| CAFR/L-4T16-100150 | 4 | 100 | 150 | 4 | 16 | 45 | 10.5 |
| CAFR/L-4T16-150250 | 4 | 150 | 250 | 4 | 16 | 45 | 10.5 |
| CAFR/L-5T20-055080 | 5 | 55 | 80 | 5 | 20 | 49 | 10.5 |
| CAFR/L-5T20-080120 | 5 | 80 | 120 | 5 | 20 | 49 | 10.5 |
| CAFR/L-5T20-120180 | 5 | 120 | 180 | 5 | 20 | 49 | 10.5 |
| CAFR/L-5T20-180300 | 5 | 180 | 300 | 5 | 20 | 49 | 10.5 |
| CAFR/L-5T20-300000 | 5 | 300 | ∞ | 5 | 20 | 49 | 10.5 |
| CAFR/L-6T25-060090 | 6 | 60 | 90 | 6 | 25 | 55 | 10.5 |
| CAFR/L-6T25-090150 | 6 | 90 | 150 | 6 | 25 | 55 | 10.5 |
| CAFR/L-6T25-150250 | 6 | 150 | 250 | 6 | 25 | 55 | 10.5 |
| CAFR/L-6T25-250400 | 6 | 250 | 400 | 6 | 25 | 55 | 10.5 |

• When depth is deeper than (insert length - 1.5 mm), 1 corner type is recommended.
(1) "*f*" value is calculated with groove width "*W*" shown in the table.
(2) Not applicable for CAFR/L-3T12-040055
(3) Seat sizes of DTF are Only 3 and 4
• For applicable Insert, see page C073 - C085.

### SPARE PARTS





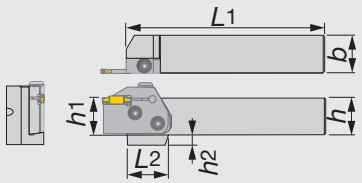
| Designation | Clamping screw | Wrench |
|---|---|---|
| CAFR/L... | BHM6-20-A | P-4 |

### Min. diameter ø*D*m of DTE, DGS and DGM insert

| Insert | ø*D*m | Note |
|---|---|---|
| DTE 3 / DGS 3 / DGM 3 | ø92 | When diameter is smaller than ø*D*m, DTF or DTX type insert is recommended. |
| DTE 4 / DGS 4 / DGM 4 | ø42 | |
| DTE 5 / DGS 5 / DGM 5 | ø64 | |
| DTE 6 / DGS 6 / DGM 6 | ø61 | |

## TUNGCUT CHSR/L

Shank of toolholders for CAER/L & CAFR/L blades




Right hand (R) shown.

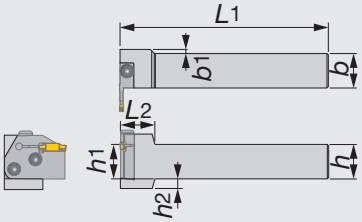
| Designation | h | b | $L_1$ | $L_2$ | $h_1$ | $h_2$ | Blade |
|---|---|---|---|---|---|---|---|
| CHSR/L2020 | 20 | 20 | 133 | 35 | 20 | 12 | CAER/L...,CAFL/R... |
| CHSR/L2525 | 25 | 25 | 133 | 28 | 25 | 7 | CAER/L...,CAFL/R... |
| CHSR/L3232 | 32 | 32 | 153 | 28 | 32 | - | CAER/L...,CAFL/R... |

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| CHSR/L... | CSHB-6-A | P-4 |

## TUNGCUT CHFVR/L

Shank of perpendicular toolholders for CAER/L & CAFR/L blades




Right hand (R) shown.

| Designation | h | b | $L_1$ | $L_2$ | $h_1$ | $h_2$ | $b_1$ | Blade |
|---|---|---|---|---|---|---|---|---|
| CHFVR/L2020 | 20 | 20 | 150 | 25 | 20 | 12 | 8 | CAEL/R...,CAFR/L... |
| CHFVR/L2525 | 25 | 25 | 150 | 25 | 25 | 7 | 3 | CAEL/R...,CAFR/L... |
| CHFVR/L3232 | 32 | 32 | 170 | 25 | 32 | - | - | CAEL/R...,CAFR/L... |

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| CHFVR/L... | CSHB-6-A | P-4 |

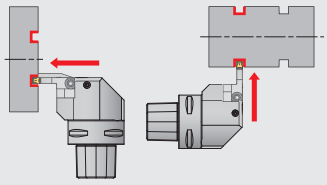
### Combination of blade and toolholder

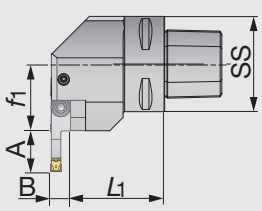
| Toolholders | Blade | | | |
|---|---|---|---|---|
| | CAER... | CAEL... | CAFR... | CAFL... |
| CHSR... | ● | | | ● |
| CHSL... | | ● | ● | |
| CHFVR... | | ● | ● | |
| CHFVL... | ● | | | ● |

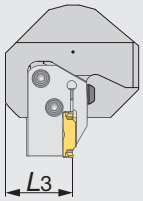
● : Correspondence

## C-CHFVR/L

TungCut shank of perpendicular toolholders for CAER/L & CAFR/L blades






Right hand (R) shown.

| Designation | SS | $L_1$ | $L_3$ | $f_1$ | Blade |
|---|---|---|---|---|---|
| C4CHFVR/L27050N | 40 | 42.5 | 36 | 27 | CAEL/R..., CAFR/L... |
| C5CHFVR/L35060N | 50 | 49.5 | 36 | 35 | CAEL/R..., CAFR/L... |
| C6CHFVR/L45065 | 63 | 54.5 | 41 | 45 | CAEL/R..., CAFR/L... |
| C6CHFVR/L45065N | 63 | 54.5 | 41 | 45 | CAEL/R..., CAFR/L... |

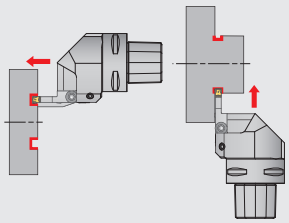
• The last character of designation is "N":Capable for 7Mpa, coolant pressure.

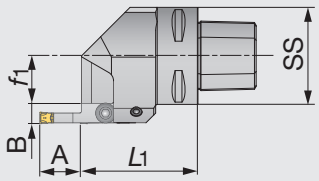
### SPARE PARTS

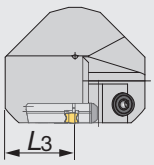
| Designation | Coolant parts | Coolant parts 1 | Clamping screw | Wrench |
|---|---|---|---|---|
| C4CHFVR/L27050N | SATZ-M8X1-M3 | - | CSHB-6-A | P-4 |
| C5CHFVR/L35060N | SATZ-M10X1-M5 | - | CSHB-6-A | P-4 |
| C6CHFVR/L45065 | CNZ125 | PNZ5 | CSHB-6-A | P-4 |
| C6CHFVR/L45065N | SATZ-M10X1-M5 | - | CSHB-6-A | P-4 |

## C-CHSR/L

TungCut shank of toolholders for CAER/L & CAFR/L blades






Right hand (R) shown.

| Designation | SS | $L_1$ | $L_3$ | $f_1$ | Blade |
|---|---|---|---|---|---|
| C4CHSR/L27050N | 40 | 50 | 36 | 16.5 | CAER/L..., CAFL/R... |
| C5CHSR/L35060 | 50 | 60 | 36 | 24.5 | CAER/L..., CAFL/R... |
| C5CHSR/L35060N | 50 | 60 | 36 | 24.5 | CAER/L..., CAFL/R... |
| C6CHSR/L45065N | 63 | 65 | 41 | 34.5 | CAER/L..., CAFL/R... |

• The last character of designation is "N":Capable for 7Mpa, coolant pressure.

### SPARE PARTS

| Designation | Coolant parts | Coolant parts 1 | Clamping screw | Wrench |
|---|---|---|---|---|
| C4CHSR/L27050N | SATZ-M8X1-M3 | - | CSHB-6-A | P-4 |
| C5CHSR/L35060 | CNZ125 | PNZ5 | CSHB-6-A | P-4 |
| C5CHSR/L3506N | SATZ-M10X1-M5 | - | CSHB-6-A | P-4 |
| C6CHSR/L45065N | SATZ-M10X1-M5 | - | CSHB-6-A | P-4 |

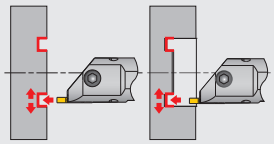
### Combination of blade and toolholder

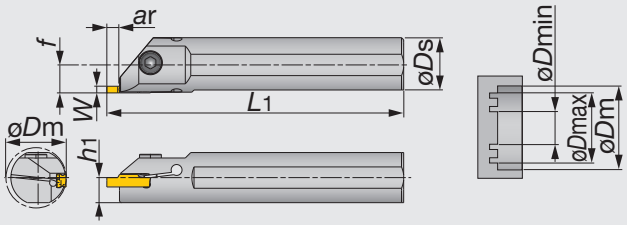
| Toolholders | Blade | | | |
|---|---|---|---|---|
| | CAER... | CAEL... | CAFR... | CAFL... |
| C*CHFVR... | ● | | | ● |
| C*CHFVL... | | ● | ● | |
| C*CHSR... | | ● | ● | |
| C*CHSL... | ● | | | ● |

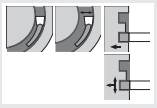
● : Correspondence

## CTIFR/L

Toolholders for face / internal face grooving & turning





Insert:
DGM, DGS,
DGG, DTE,
DTF, DTX, DTR

Right hand (R) shown.

| Designation | W | Seat size | ar | øDs | h1 | L1(1) | f |
|---|---|---|---|---|---|---|---|
| CTIFR/L25-4T05-D270 | 4 | 3, 4 | 5.5 | 25 | 11.5 | 200 | 13.3 |
| CTIFR/L32-4T05-D340 | 4 | 3, 4 | 5.5 | 32 | 15 | 250 | 16.8 |
| CTIFR/L25-5T05-D270 | 6 | 5, 6 | 5.5 | 25 | 11.5 | 200 | 13.3 |
| CTIFR/L32-5T05-D340 | 6 | 5, 6 | 5.5 | 32 | 15 | 250 | 16.8 |

(1) "f" value is calculated with groove width "W" shown in the table.**
• For applicable Insert, see page C073 - C085.

### SPARE PARTS





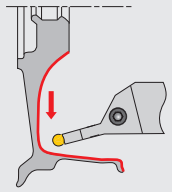
| Designation | Clamping screw | Wrench |
|---|---|---|
| CTIFR/L25-4T05-D270 | CM6X1X16-A | P-5 |
| CTIFR/L32-4T05-D340 | CM6X1X20-A | P-5 |
| CTIFR/L25-5T05-D270 | CM6X1X16-A | P-5 |
| CTIFR/L32-5T05-D340 | CM6X1X20-A | P-5 |

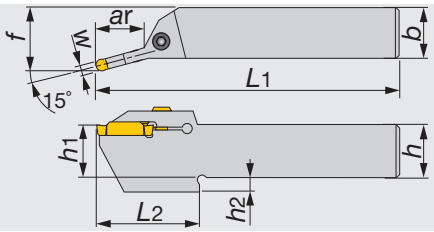
| Insert seat size | Min. bore dia. øDm | |
|---|---|---|
| | øDs = 25 mm | øDs = 32 mm |
| 3 | 26.3 | 33.3 |
| 4 | 26.8 | 33.8 |
| 5 | 26.3 | 33.3 |
| 6 | 26.8 | 33.8 |

| Insert seat size | øDmin | | | | øDmax |
|---|---|---|---|---|---|
| | DGM, DGS, DGG | DTE | DTF / DTX | DTR | |
| 3 | 92 | 62 | 19 | 44 | ∞ |
| 4 | 37 | 42 | 20 | 32 | ∞ |
| 5 | 60 | 64 | 20 | 48 | ∞ |
| 6 | 57 | 61 | 23 | 48 | ∞ |

# TUNGCUT
## CTER/L-15A

Toolholders for machining aluminum wheel, square shank






Right hand (R) shown.

| Designation | W | Seat size | ar | h | b | L1 | f | L2 | h1 | h2 | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CTER/L2525-6T25-15A | 6 | 6 | 25 | 25 | 25 | 150 | 32.2 | 50.5 | 25 | 7 | DTA... |
| CTER/L2525-8T30-15A | 8 | 8 | 30 | 25 | 25 | 150 | 32.9 | 55 | 25 | 7 | DTA... |

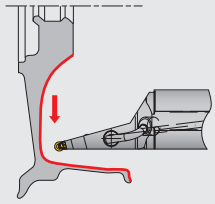
• For applicable Insert, see page C073 - C085.

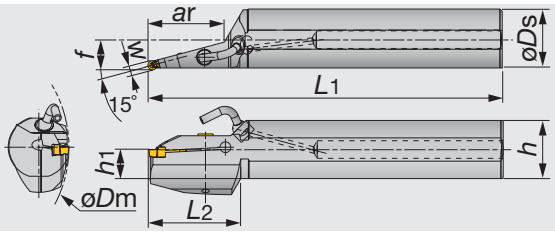
### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| CTER/L2525-****-15A | CM6X1X25-A | P-5 |

# TUNGCUT
## CGIUR/L-15A

Boring bars for machining aluminum wheel






Right hand (R) shown.

| Designation | W | øDm | Seat size | ar | øDs | f | L1 | L2 | h | h1 | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CGIUR/L40-6T50-D160-15A | 6 | 160 | 6 | 50 | 40 | 19.7 | 320 | 60 | 38.5 | 19 | DTA... |
| CGIUR/L40-8T83-D160-15A | 8 | 160 | 8 | 83 | 40 | 20.5 | 320 | 85 | 38.5 | 19 | DTA... |
| CGIUR/L50-6T85-D200-15A | 6 | 200 | 6 | 85 | 50 | 25.2 | 350 | 85 | 48.5 | 23.5 | DTA... |
| CGIUR/L50-8T85-D200-15A | 8 | 200 | 8 | 85 | 50 | 25.9 | 350 | 85 | 48.5 | 23.5 | DTA... |

• For applicable Insert, see page C073 - C085.

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| CGIUR/L**-15A | CM6X1X25-A | P-5 |

### Nozzle parts

| Coolant pipe | Coolant nozzle |
|---|---|
| PNZ5 | CNZ125 |

## External grooving and parting

### DGM type (2 corners) SGM type (1 corner)



C077

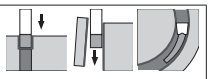
**1st choice for external grooving and parting off**

Smooth chip evacuation

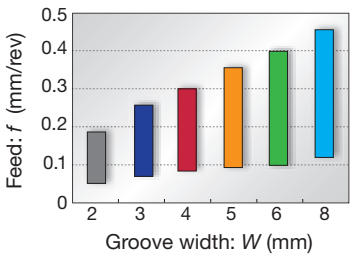
Well-designed edge with high strength

Handed insert available

*W* = 2 - 8 mm



■ Standard feed




### DGS type (2 corners) SGS type (1 corner)



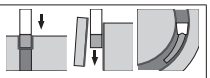
C078, C079

**Lower cutting force and superior sharpness**

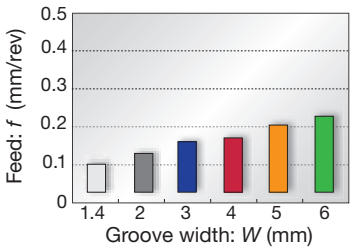
Unique-designed edge and chipbreaker

Handed insert available

*W* = 1.4 - 6 mm



■ Standard feed




Grooving Tool

## External and face grooving, and turning

### DTE type (2 corners)



C080, C081

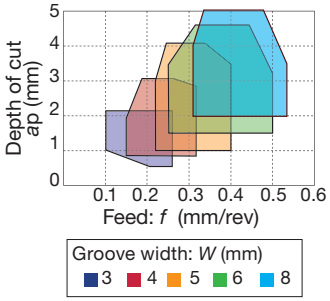
**For general purpose**

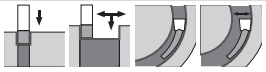
Unique chipbreaker makes chips shorter

Molded and ground insert available

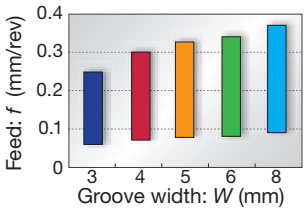
*W* = 3 - 8 mm

■ Standard feed and DoC



■ Standard feed




## External and face grooving

### DGG type (2 corners)



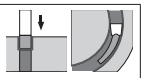
C081

**For non-ferrous materials and titanium**

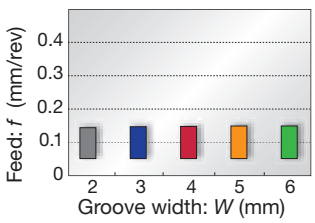
Chipbreaker with low cutting force

Sharp cutting edge that prevents vibration and delivers fine surface finish

*W* = 2 - 6 mm



■ Standard feed



## External, internal and face grooving, and turning

### DTX type (2 corners)



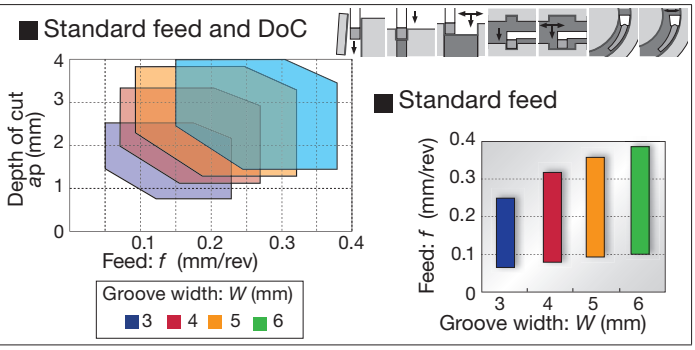
C081

**Multi-functional type**

Well balanced sharpness and strength

Multi functional insert

*W* = 3 - 6 mm




## External grooving

### DGE type (2 corners)

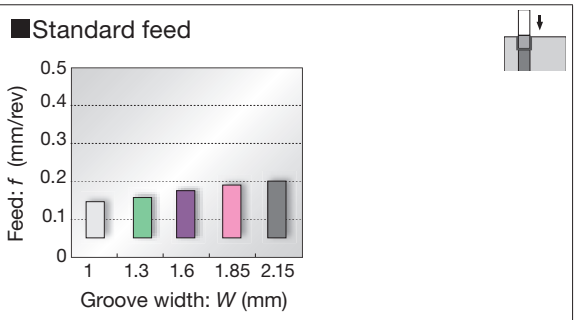


C080

**For high accurate and shallow groove**

Excellent chip control

*W* = 1 - 2.15 mm




## Profiling and undercutting

### DTR type (2 corners)

Molded



Ground



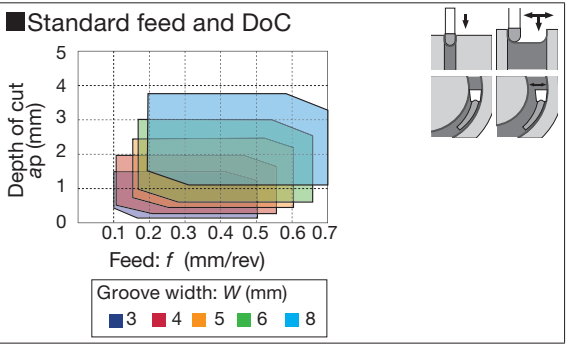
C083, C084

**Full radius type**

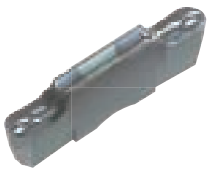
Excellent chip control

Molded and ground insert available

*W* = 3 - 8 mm




### DTIU type (2 corners)



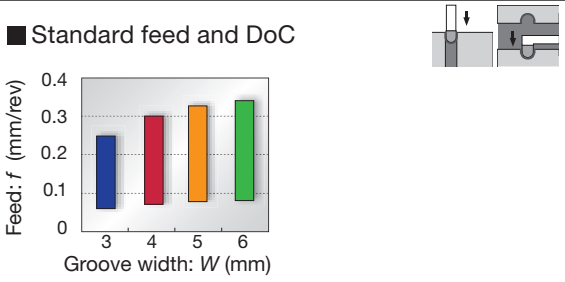
C084

**Full radius type**

Excellent chip control

For undercutting

*W* = 3 - 6 mm




Grooving Tool

## Internal grooving and turning

### DTI type (2 corners)



C082

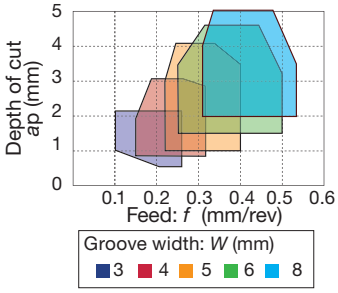
**1st choice for internal grooving**

Unique chipbreaker makes chips shorter

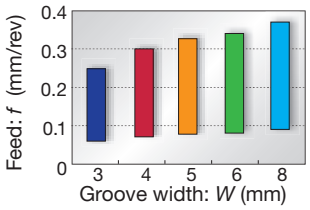
Molded and ground insert available

*W* = 3 - 8 mm

■ Standard feed and DoC




■ Standard feed




## Small diameter internal grooving

### DGIM type (2 corners)



C083

**2 mm insert width only** (For general purpose)

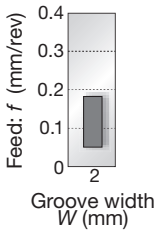
Unique chipbreaker for excellent chip control

Excellent fracture resistance due to optimum land on the cutting edge

For general applications on steels & stainless steels

*W* = 2 mm

■ Standard feed




### DGIS type (2 corners)



C083

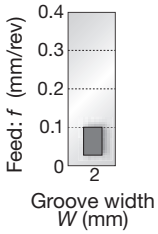
**2 mm insert width only** (Lower cutting force)

Low cutting force due to a unique land geometry

Applicable for low carbon steels & stainless steels

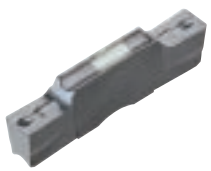
*W* = 2 mm

■ Standard feed




## Face grooving and turning

### DTF type (2 corners)



C082

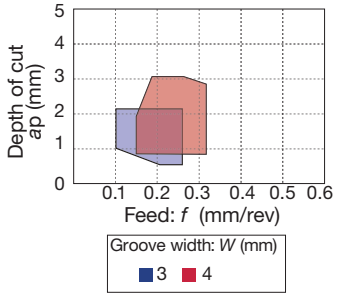
**1st choice for face grooving**

Unique chipbreaker makes chips shorter

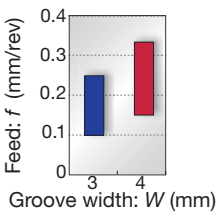
Handed insert

*W* = 3 - 4 mm

■ Standard feed and DoC




■ Standard feed



## Aluminium wheel machining

**DTA type (2 corners)**



C084

**Full radius type**

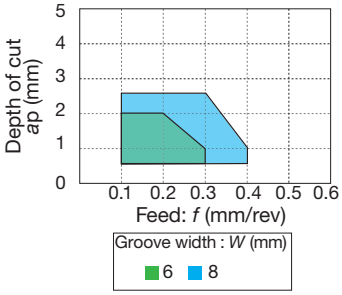
Excellent chip control

For aluminium wheel profiling

Ground insert

W = 6 - 8 mm

■ Standard feed and DoC






## External grooving of hardened steels

**SGN-CBN type (1 corner)**



C085

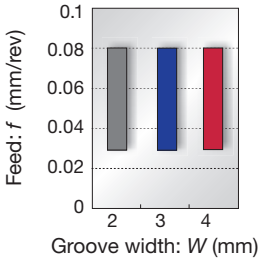
**For hardened steel cutting**

Optimum cutting edge shape for grooving of hardened steels

High tolerance width for finishing (*W* = ±0.025 mm)

*W* = 2 - 4 mm

■ Standard feed

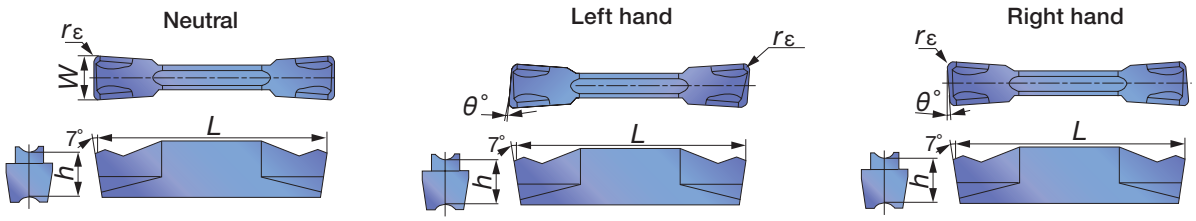





Grooving Tool

## DGM

External grooving and parting off, 2 corner

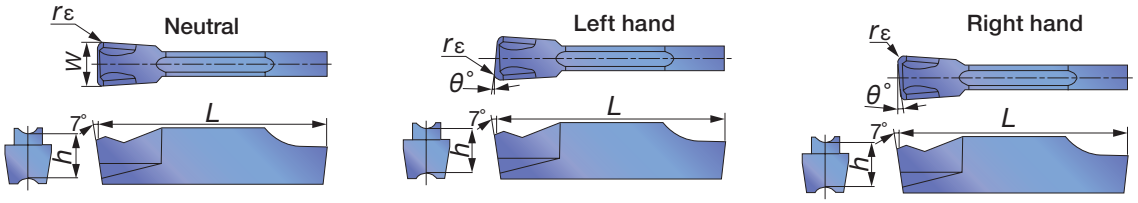



| Designation | Insert seat size | W±0.05 | rε | Coating | | | | | | | | | | Cermet | | L | h | θ° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9125 | | AH7025 | | AH725 | | AH905 | | GH130 | | NS9530 | | | | |
| | | | | R | L | R | L | R | L | R | L | R | L | R | L | | | |
| DGM2-020 | 2 | 2 | 0.2 | ● | | ● | | ● | | | | ● | | ● | | 20 | 5 | 0 |
| DGM2-020-6R/L | 2 | 2 | 0.2 | | | | | ● | ● | | | ● | ● | | | 19.8 | 5 | 6 |
| DGM2-020-8R/L | 2 | 2 | 0.2 | | | | | ● | ● | | | ● | ● | | | 19.8 | 5 | 8 |
| DGM2-020-15R/L | 2 | 2 | 0.2 | | | | | ● | ● | | | ● | ● | | | 19.8 | 5 | 15 |
| DGM2-002-15R/L | 2 | 2 | 0.02 | | | | | ● | ● | | | ● | ● | | | 19.35 | 5 | 15 |
| DGM3-020 | 3 | 3 | 0.2 | ● | | ● | | ● | | ● | | ● | | ● | | 20 | 5 | 0 |
| DGM3-020-6R/L | 3 | 3 | 0.2 | | | | | ● | ● | | | ● | ● | | | 19.9 | 5 | 6 |
| DGM3-002-6R/L | 3 | 3 | 0.02 | | | | | ● | ● | | | ● | ● | | | 19.45 | 5 | 6 |
| DGM3-020-15R/L | 3 | 3 | 0.2 | | | | | ● | ● | | | ● | ● | | | 19.9 | 5 | 15 |
| DGM4-030 | 4 | 4 | 0.3 | ● | | ● | | ● | | ● | | ● | | ● | | 20 | 5 | 0 |
| DGM4-030-4R/L | 4 | 4 | 0.3 | | | | | ● | ● | | | ● | ● | | | 19.8 | 5 | 4 |
| DGM4-030-15R/L | 4 | 4 | 0.3 | | | | | ● | ● | | | ● | ● | | | 19.8 | 5 | 15 |
| DGM5-030 | 5 | 5 | 0.3 | ● | | ● | | ● | | ● | | ● | | ● | | 25 | 5.5 | 0 |
| DGM5-030-4R | 5 | 5 | 0.3 | | | | | ● | | | | ● | | | | 24.9 | 5.5 | 4 |
| DGM6-030 | 6 | 6 | 0.3 | ● | | ● | | ● | | ● | | ● | | | | 25 | 5.5 | 0 |
| DGM8-040 | 8 | 8 | 0.4 | ● | | | | ● | | | | ● | | | | 30 | 6.7 | 0 |

● : Line-up

## SGM

External deep grooving and parting off, 1 corner

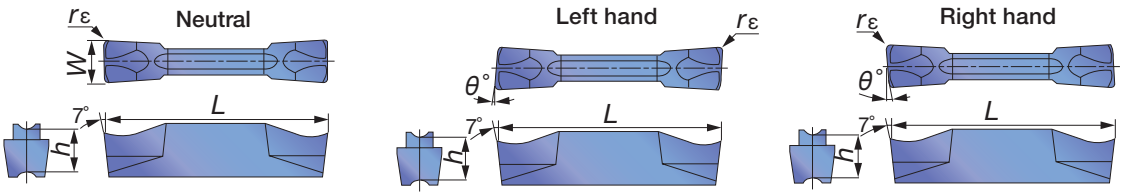



| Designation | Insert seat size | W±0.05 | rε | Coating | | | | L | h | θ° |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | AH725 | | GH130 | | | | |
| | | | | R | L | R | L | | | |
| SGM2-020 | 2 | 2 | 0.2 | | ● | | ● | 20 | 5 | 0 |
| SGM2-020-6R/L | 2 | 2 | 0.2 | ● | ● | ● | ● | 19.8 | 5 | 6 |
| SGM3-020 | 3 | 3 | 0.2 | | ● | | ● | 20 | 5 | 0 |
| SGM3-020-6R/L | 3 | 3 | 0.2 | ● | ● | ● | ● | 19.6 | 5 | 6 |
| SGM3-020-15R/L | 3 | 3 | 0.2 | ● | ● | ● | ● | 19.6 | 5 | 15 |
| SGM4-030 | 4 | 4 | 0.3 | | ● | | ● | 20 | 5 | 0 |
| SGM4-030-4R/L | 4 | 4 | 0.3 | ● | ● | ● | ● | 19.65 | 5 | 4 |
| SGM5-030 | 5 | 5 | 0.3 | | ● | | ● | 25 | 5.5 | 0 |
| SGM6-030 | 6 | 6 | 0.3 | | ● | | ● | 25 | 5.5 | 0 |

● : Line-up

## DGS

External grooving and parting off, 2 corner




| Designation | Insert seat size | W±0.05 | rε | Coating | | | | | | | | Cermet | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9125 | | AH7025 | | AH725 | | GH130 | | NS9530 | | | | |
| | | | | R | L | R | L | R | L | R | L | R | L | L | h | θ° |
| DGS1.4-016 | 1 | 1.4 | 0.16 | | | | | ● | | ● | | | | 16 | 4.3 | 0 |
| DGS2-020 | 2 | 2 | 0.2 | ● | | ● | | ● | | ● | | ● | | 20 | 5 | 0 |
| DGS2-020-6R/L | 2 | 2 | 0.2 | | | | | ● | ● | ● | ● | | | 19.95 | 5 | 6 |
| DGS2-002-6R/L | 2 | 2 | 0.02 | | | | | ● | ● | ● | ● | | | 19.8 | 5 | 6 |
| DGS2-020-15R/L | 2 | 2 | 0.2 | | | | | ● | ● | ● | ● | | | 19.95 | 5 | 15 |
| DGS2-002-15R/L | 2 | 2 | 0.02 | | | | | ● | ● | ● | ● | | | 19.8 | 5 | 15 |
| DGS3-020 | 3 | 3 | 0.2 | ● | | ● | | ● | | ● | | ● | | 20 | 5 | 0 |
| DGS3-020-6R/L | 3 | 3 | 0.2 | | | | | ● | ● | ● | ● | | | 19.9 | 5 | 6 |
| DGS3-002-6R/L | 3 | 3 | 0.02 | | | | | ● | ● | ● | ● | | | 19.6 | 5 | 6 |
| DGS3-020-15R/L | 3 | 3 | 0.2 | | | | | ● | ● | ● | ● | | | 19.9 | 5 | 15 |
| DGS3-002-15R/L | 3 | 3 | 0.02 | | | | | ● | ● | ● | ● | | | 19.45 | 5 | 15 |
| DGS4-030 | 4 | 4 | 0.3 | ● | | ● | | ● | | ● | | ● | | 20 | 5 | 0 |
| DGS4-030-4R/L | 4 | 4 | 0.3 | | | | | ● | ● | ● | ● | | | 19.8 | 5 | 4 |
| DGS5-030 | 5 | 5 | 0.3 | ● | | | | ● | | ● | | ● | | 25 | 5.5 | 0 |
| DGS6-030 | 6 | 6 | 0.3 | ● | | | | ● | | ● | | | | 25 | 5.5 | 0 |

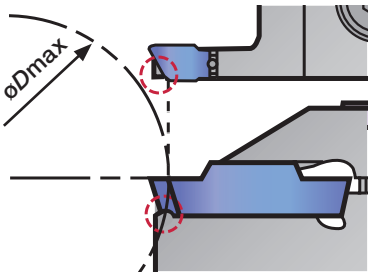
● : Line-up

## Caution

| Designation | øDmax (mm) |
|---|---|
| DGM2-002-15R/L | 28 |
| DGM3-002-15R/L | 29 |
| DGM4-030-15R/L | 30 |
| SGM3-020-15R/L | 103 |

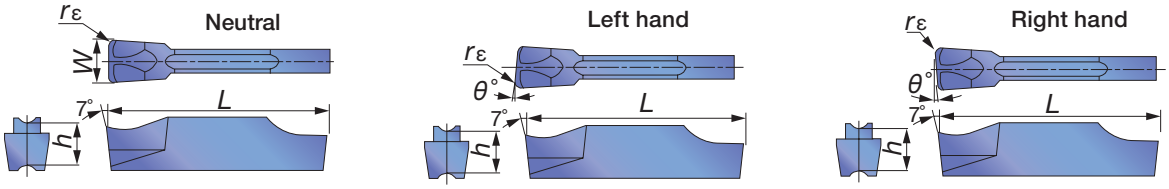
| Designation | øDmax (mm) |
|---|---|
| DGS2-002-15R/L | 28 |
| DGS3-002-15R/L | 29 |
| SGS3-020-15R/L | 103 |
| SGS3-002-15R/L | 34 |

The tool will interfere with the workpiece when grooving larger diameter than øDmax.



## SGS

External deep grooving and parting off, 1 corner

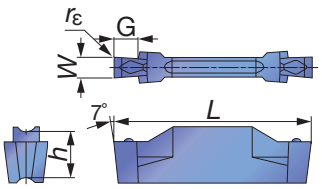



| Designation | Insert seat size | W±0.05 | rε | Coating | | | | L | h | θ° |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | AH725 | | GH130 | | | | |
| | | | | R | L | R | L | | | |
| SGS2-020 | 2 | 2 | 0.2 | | ● | | ● | 20 | 5 | 0 |
| SGS2-020-6R/L | 2 | 2 | 0.2 | ● | ● | ● | ● | 19.8 | 5 | 6 |
| SGS2-020-15R/L | 2 | 2 | 0.2 | ● | ● | ● | ● | 19.8 | 5 | 15 |
| SGS3-020 | 3 | 3 | 0.2 | | ● | | ● | 20 | 5 | 0 |
| SGS3-020-6R/L | 3 | 3 | 0.2 | ● | ● | ● | ● | 19.64 | 5 | 6 |
| SGS3-002-6R/L | 3 | 3 | 0.02 | ● | ● | ● | ● | 19.8 | 5 | 6 |
| SGS3-020-15R/L | 3 | 3 | 0.2 | ● | ● | ● | ● | 19.64 | 5 | 15 |
| SGS3-002-15R/L | 3 | 3 | 0.02 | ● | ● | ● | ● | 19.8 | 5 | 15 |
| SGS4-030 | 4 | 4 | 0.3 | | ● | | ● | 20 | 5 | 0 |
| SGS5-030 | 5 | 5 | 0.3 | | ● | | ● | 25 | 5.5 | 0 |
| SGS6-030 | 6 | 6 | 0.3 | | ● | | ● | 25 | 5.5 | 0 |

● : Line-up

## DGE

External grooving




| Designation | Insert seat size | W±0.02 | rε | Coating | | Cermet | G | L | h |
|---|---|---|---|---|---|---|---|---|---|
| | | | | AH725 | GH130 | NS9530 | | | |
| DGE100-000 | 2 | 1 | 0 | ● | ● | ● | 2.5 | 20 | 5 |
| DGE130-000 | 2 | 1.3 | 0 | ● | ● | ● | 2.5 | 20 | 5 |
| DGE160-010 | 2 | 1.6 | 0.1 | ● | ● | ● | 2.5 | 20 | 5 |
| DGE185-010 | 2 | 1.85 | 0.1 | ● | ● | ● | 3.5 | 20 | 5 |
| DGE215-015 | 2 | 2.15 | 0.15 | ● | ● | ● | 3.5 | 20 | 5 |

● : Line-up

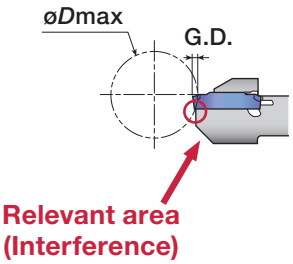


### Caution

*ø*Dmax is limited as shown in the picture to the right according to the groove depth, G.D. Please refer to the following table.

G.D = Groove depth

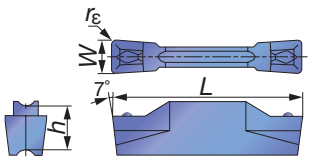
| Designation | Max. groove depth (mm) | *ø*Dmax (mm) | | | | |
|---|---|---|---|---|---|---|
| | | G.D. = 1 | G.D. = 1.5 | G.D. = 2 | G.D. = 2.5 | G.D. = 3 |
| DGE100-000 | 2 | ∞ | 18.6 | 11.5 | - | - |
| DGE130-000 | | | | | | |
| DGE160-010 | | | | | | |
| DGE185-010 | 3 | | | | 8.8 | 7 |
| DGE215-015 | | | | | | |




## DTE

External, grooving and turning

Ground

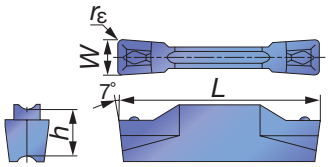



| Designation | Insert seat size | W±0.02 | rε | Coating | | | | Cermet | L | h |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9125 | AH7025 | AH725 | GH130 | NS9530 | | |
| DTE265-015 | 3 | 2.65 | 0.15 | ● | ● | ● | ● | ● | 20 | 5 |
| DTE300-020 | 3 | 3 | 0.2 | ● | ● | ● | ● | ● | 20 | 5 |
| DTE300-040 | 3 | 3 | 0.4 | ● | | ● | ● | ● | 20 | 5 |
| DTE315-015 | 3 | 3.15 | 0.15 | ● | | ● | ● | ● | 20 | 5 |
| DTE400-040 | 4 | 4 | 0.4 | ● | | ● | ● | ● | 20 | 5 |
| DTE400-080 | 4 | 4 | 0.8 | ● | ● | ● | ● | ● | 20 | 5 |
| DTE415-015 | 4 | 4.15 | 0.15 | ● | | ● | ● | ● | 20 | 5 |
| DTE478-055 | 5 | 4.78 | 0.55 | ● | | ● | ● | ● | 25 | 5.5 |
| DTE500-040 | 5 | 5 | 0.4 | ● | | ● | ● | ● | 25 | 5.5 |
| DTE500-080 | 5 | 5 | 0.8 | ● | ● | ● | ● | ● | 25 | 5.5 |
| DTE515-015 | 5 | 5.15 | 0.15 | ● | | ● | ● | | 25 | 5.5 |
| DTE600-080 | 6 | 6 | 0.8 | ● | ● | ● | ● | | 25 | 5.5 |
| DTE600-120 | 6 | 6 | 1.2 | ● | | ● | ● | | 25 | 5.5 |
| DTE800-080 | 8 | 8 | 0.8 | ● | | ● | ● | | 30 | 6.7 |
| DTE800-120 | 8 | 8 | 1.2 | ● | | ● | ● | | 30 | 6.7 |

● : Line-up

## DTE

External, grooving and turning
Molded

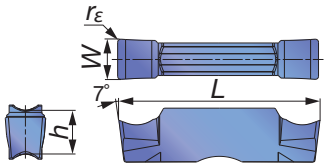



| Designation | Insert seat size | W±0.05 | rε | Coating | | | | Cermet | L | h |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9125 | AH7025 | AH725 | GH130 | NS9530 | | |
| DTE3-040 | 3 | 3 | 0.4 | ● | ● | ● | ● | ● | 20 | 5 |
| DTE4-040 | 4 | 4 | 0.4 | ● | ● | ● | ● | ● | 20 | 5 |

● : Line-up

## DGG

External and face grooving

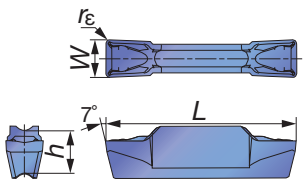



| Designation | Insert seat size | W±0.02 | rε | Cermet | Uncoated | L | h |
|---|---|---|---|---|---|---|---|
| | | | | NS9530 | KS05F | | |
| DGG200-020 | 2 | 2 | 0.2 | ● | ● | 20 | 5 |
| DGG300-020 | 3 | 3 | 0.2 | ● | ● | 20 | 5 |
| DGG400-040 | 4 | 4 | 0.4 | ● | ● | 20 | 5 |
| DGG500-040 | 5 | 5 | 0.4 | ● | ● | 25 | 5.5 |
| DGG600-040 | 6 | 6 | 0.4 | ● | ● | 25 | 5.5 |

● : Line-up

## DTX

External, internal, face grooving and turning

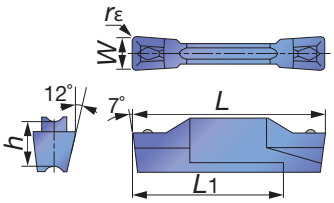



| Designation | Insert seat size | W±0.05 | rε | Coating | | | | Cermet | L | h |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9125 | AH7025 | AH725 | GH130 | NS9530 | | |
| DTX3-030 | 3 | 3 | 0.3 | ● | ● | ● | ● | ● | 20 | 5 |
| DTX4-040 | 4 | 4 | 0.4 | ● | ● | ● | ● | ● | 20 | 5 |
| DTX5-040 | 5 | 5 | 0.4 | ● | ● | ● | ● | ● | 25 | 5.5 |
| DTX6-080 | 6 | 6 | 0.8 | | | ● | ● | | 25 | 5.5 |

● : Line-up

## DTF

Face grooving and turning



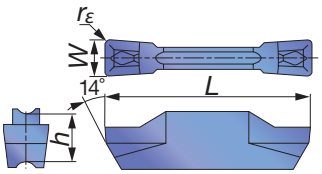

| Designation | Insert seat size | W±0.05 | rε | Coating | | | | | | Cermet | | L | h | L1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9125 | | AH725 | | GH130 | | NS9530 | | | | |
| | | | | R | L | R | L | R | L | R | L | | | |
| DTF3-040-R/L | 3 | 3 | 0.4 | ● | ● | ● | ● | ● | ● | ● | ● | 20 | 5 | 16 |
| DTF4-040-R/L | 4 | 4 | 0.4 | ● | ● | ● | ● | ● | ● | ● | ● | 20 | 5 | 16 |

● : Line-up

Grooving Tool

## DTI

Internal grooving and turning
Ground

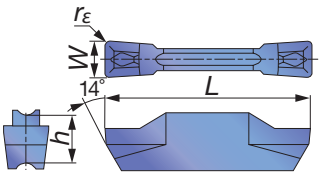



| Designation | Insert seat size | W±0.02 | rε | Coating | | | Cermet | L | h |
|---|---|---|---|---|---|---|---|---|---|
| | | | | T9125 | AH725 | GH130 | NS9530 | | |
| DTI300-040 | 3 | 3 | 0.4 | ● | ● | ● | ● | 20 | 5 |
| DTI400-040 | 4 | 4 | 0.4 | ● | ● | ● | ● | 20 | 5 |
| DTI400-080 | 4 | 4 | 0.8 | ● | ● | ● | ● | 20 | 5 |
| DTI500-040 | 5 | 5 | 0.4 | ● | ● | ● | ● | 25 | 5.5 |
| DTI500-080 | 5 | 5 | 0.8 | ● | ● | ● | ● | 25 | 5.5 |
| DTI600-080 | 6 | 6 | 0.8 | ● | ● | ● | | 25 | 5.5 |
| DTI600-120 | 6 | 6 | 1.2 | ● | ● | ● | | 25 | 5.5 |
| DTI800-080 | 8 | 8 | 0.8 | ● | ● | ● | | 30 | 6.7 |
| DTI800-120 | 8 | 8 | 1.2 | ● | ● | ● | | 30 | 6.7 |

● : Line-up

## DTI

Internal grooving and turning
Molded

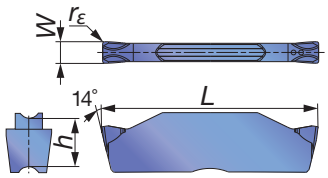



| Designation | Insert seat size | W±0.05 | rε | Coating | | | | Cermet | L | h |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9125 | AH7025 | AH725 | GH130 | NS9530 | | |
| DTI3-040 | 3 | 3 | 0.4 | ● | ● | ● | ● | ● | 20 | 5 |
| DTI4-040 | 4 | 4 | 0.4 | ● | | ● | ● | ● | 20 | 5 |

● : Line-up

## DGIM

Small diameter internal grooving

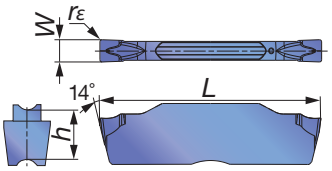



| Designation | Insert seat size | W±0.05 | rε | Coating | | | Cermet | L | h |
|---|---|---|---|---|---|---|---|---|---|
| | | | | T9125 | AH725 | GH130 | NS9530 | | |
| DGIM2-020 | 2 | 2 | 0.2 | ● | ● | ● | ● | 20 | 5 |

● : Line-up

## DGIS

Small diameter internal grooving

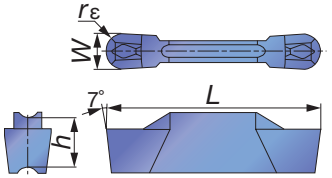



| Designation | Insert seat size | W±0.05 | rε | Coating | | | Cermet | L | h |
|---|---|---|---|---|---|---|---|---|---|
| | | | | T9125 | AH725 | GH130 | NS9530 | | |
| DGIS2-020 | 2 | 2 | 0.2 | ● | ● | ● | ● | 20 | 5 |

● : Line-up

## DTR

Profiling and undercutting
Ground

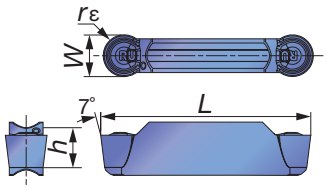



| Designation | Insert seat size | W±0.02 | rε | Coating | | | Cermet | L | h |
|---|---|---|---|---|---|---|---|---|---|
| | | | | T9125 | AH725 | GH130 | NS9530 | | |
| DTR300-150 | 3 | 3 | 1.5 | ● | ● | ● | ● | 20 | 5 |
| DTR400-200 | 4 | 4 | 2 | ● | ● | ● | ● | 20 | 5 |
| DTR478-239 | 5 | 4.78 | 2.39 | ● | ● | ● | ● | 25 | 5.5 |
| DTR500-250 | 5 | 5 | 2.5 | ● | ● | ● | ● | 25 | 5.5 |
| DTR600-300 | 6 | 6 | 3 | ● | ● | ● | | 25 | 5.5 |

● : Line-up

## DTR

Profiling and undercutting
Molded

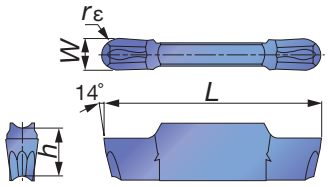



| Designation | Insert seat size | W±0.05 | rε | Coating | | | | | Cermet | L | h |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9125 | AH7025 | AH725 | AH905 | GH130 | NS9530 | | |
| DTR3-150 | 3 | 3 | 1.5 | ● | ● | ● | ● | ● | ● | 20 | 5 |
| DTR4-200 | 4 | 4 | 2 | ● | ● | ● | ● | ● | ● | 20 | 5 |
| DTR5-250 | 5 | 5 | 2.5 | ● | ● | ● | ● | ● | ● | 25 | 5.5 |
| DTR6-300 | 6 | 6 | 3 | ● | ● | ● | | ● | | 25 | 5.5 |
| DTR8-400 | 8 | 8 | 4 | ● | | ● | | ● | | 30 | 6.7 |

● : Line-up

## DTIU

Profiling and undercutting
Ground

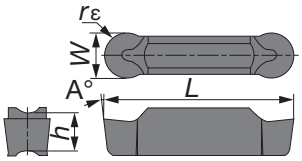



| Designation | Insert seat size | W±0.02 | rε | Coating | | L | h |
|---|---|---|---|---|---|---|---|
| | | | | AH725 | GH130 | | |
| DTIU300-150 | 3 | 3 | 1.5 | ● | ● | 20 | 5 |
| DTIU400-200 | 4 | 4 | 2 | ● | ● | 20 | 5 |
| DTIU500-250 | 5 | 5 | 2.5 | ● | ● | 25 | 5.5 |
| DTIU600-300 | 6 | 6 | 3 | ● | ● | 25 | 5.5 |

● : Line-up

## DTA

Aluminium wheel machining
Ground

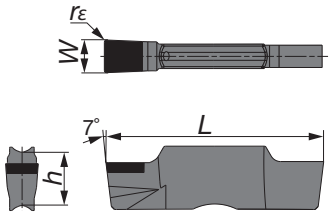



| Designation | Insert seat size | W±0.02 | rε | Uncoated | L | h | A° |
|---|---|---|---|---|---|---|---|
| | | | | TH10 | | | |
| DTA600-300 | 6 | 6 | 3 | ● | 25 | 5.5 | 7 |
| DTA800-400 | 8 | 8 | 4 | ● | 30 | 6.7 | 10 |

● : Line-up

## SGN

External grooving of hardened steels




| Designation | Insert seat size | W±0.025 | rε | CBN BX360 | L | h |
|---|---|---|---|---|---|---|
| SGN200-020 | 2 | 2 | 0.2 | ● | 20 | 5 |
| SGN300-020 | 3 | 3 | 0.2 | ● | 20 | 5 |
| SGN400-020 | 4 | 4 | 0.2 | ● | 20 | 5 |

● : Line-up

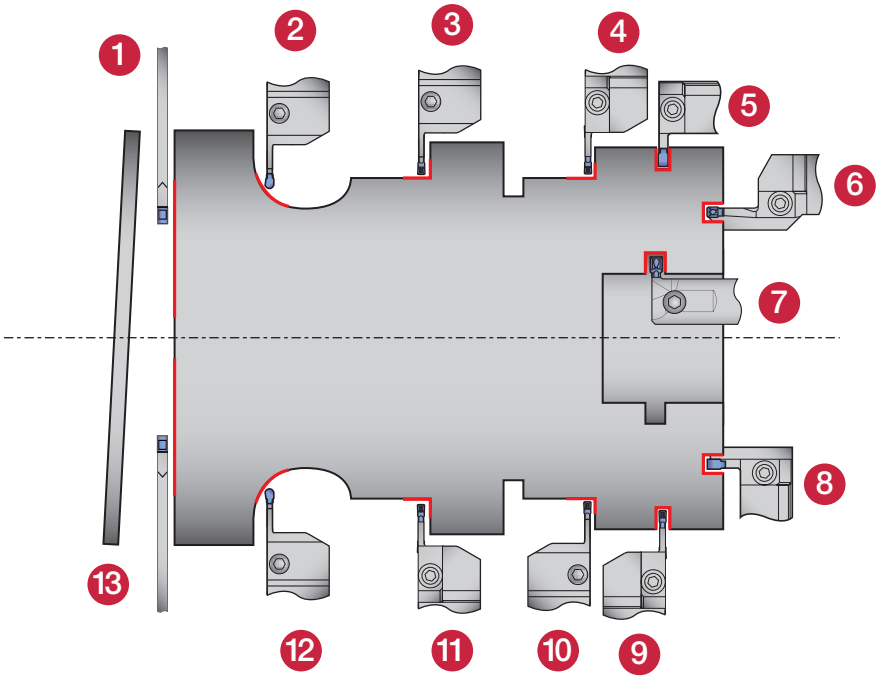


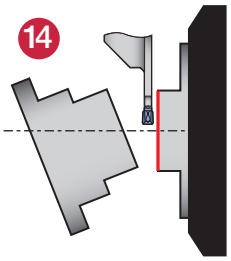
## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Hardness | Priority | Grade | Cutting speed Vc (m/min) |
|---|---|---|---|---|---|
| P | Steels (C45, 34CrMo4, etc.) | < 300 HB | First choice | AH7025, AH725 | 50 - 180 |
| | | < 300 HB | Priority for wear resistance | T9125 | 80 - 200 |
| | | < 300 HB | Priority for impact resistance | GH130 | 50 - 120 |
| | | < 300 HB | Priority for surface finish | NS9530 | 80 - 220 |
| M | Stainless steels (X10CrNiS18-9, etc.) | < 200 HB | First choice | AH7025, AH725 | 50 - 120 |
| | | < 200 HB | Priority for impact resistance | GH130 | 50 - 120 |
| K | Grey cast irons (GG25, 250, etc.) | - | First choice | GH130 | 50 - 180 |
| | Ductile cast irons (GGG45, 450-10S, etc.) | - | First choice | GH130 | 50 - 120 |
| N | Aluminium alloys (Si < 12%) | - | First choice | TH10 | 100 - 500 |
| S | Titanium alloys (Ti-6Al-4V, etc.) | < HRC 40 | First choice | AH905 | 20 - 80 |
| | | < HRC 40 | Priority for impact resistance | AH7025, AH725 | 20 - 80 |
| H | Hardened steels (34CrMo4, etc.) | > HRC 50 | First choice | BX360 | 80 - 150 |

# Wide variety of tools dramatically reduce set up time






## 1 CCH
1 corner
*W* = 3 - 5 mm
Max. parting Dia.:
120 mm
Shank size:
20 - 32 mm
C094

## 2 CGSSR/L-D
1 corner
Monoblock type
*W* = 3 - 5 mm
*ar* = 22 - 25 mm
Shank size:
16 - 25 mm
C093

## 3 CGSSR/L
1 corner
Monoblock type
*W* = 2 - 5 mm
*ar* = 12 - 16 mm
Shank size:
16 - 25 mm
C093

## 4 CGWSR/L-G
1 corner
Adaptor type
*W* = 2 - 5 mm
*ar* = 12 mm
Shank size:
20 - 25 mm
C092

## 5 CGWTR/L-G
1 corner
Adaptor type
*W* = 2 - 5 mm
*ar* = 12 mm
Shank size:
20 - 25 mm
C092

## 6 CGWSR/L *S/D*L/R
1 corner
Adaptor type
*W* = 3 - 5 mm
*ar* = 10 - 22 mm
Shank size:
20 - 25 mm
C095

## 7 CGTR/L
1 corner
Monoblock type
*W* = 3 - 5 mm
*ar* = 3.5 - 6 mm
Shank size:
ø25 - ø40 mm
C097

## 8 CGWTR/L *S/D*L/R
1 corner
Adaptor type
*W* = 3 - 5 mm
*ar* = 10 - 22 mm
Shank size:
20 - 25 mm
C096

## 9 CGWSR/L-WG
2 corner
Adaptor type
*W* = 3 - 5 mm
*ar* = 12 - 13 mm
Shank size:
20 - 25 mm
C088

## 10 CGWSR/L-W
2 corner
Monoblock type
*W* = 3 - 5 mm
*ar* = 12 - 13 mm
Shank size:
16 - 25 mm
C087

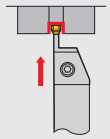
## 11 CGWSR/L -WG-L
2 corner
Adaptor type
*W* = 2 - 5 mm
*ar* = 15 - 21.5 mm
Shank size:
20 - 25 mm
C088

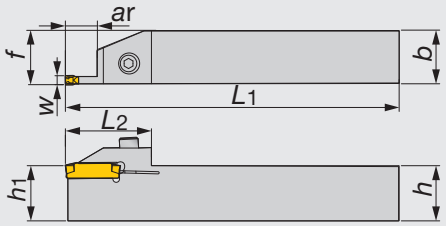
## 12 CGWSR/L -W-L
2 corner
Monoblock type
*W* = 3 - 5 mm
*ar* = 15 - 21.5 mm
Shank size:
16 - 25 mm
C087

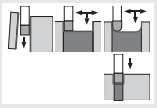
## 13 CCH-W
2 corner
*W* = 2 - 5 mm
Max. parting Dia.:
42 mm
Shank size:
20 - 32 mm
C089

## 14 JCGSSR/L
1 corner
For swiss type machine
*W* = 2 mm
Max. parting Dia.:
32 mm
Shank size:
10 - 16 mm
C094

# MY-T SERIES
## CGWSR/L-W
External toolholders for grooving & turning





Right hand (R) shown.

| Designation | W | ar | h | b | L1 | L2 | h1 | f | Insert |
|---|---|---|---|---|---|---|---|---|---|
| CGWSR/L1616-W30 | 3 | 12 | 16 | 16 | 125 | 34 | 16 | 16.4 | WG*30, WGE30R/L |
| CGWSR/L2020-W30 | 3 | 12 | 20 | 20 | 150 | 34 | 20 | 20.4 | WG*30, WGE30R/L |
| CGWSR/L2525-W30 | 3 | 12 | 25 | 25 | 150 | 34 | 25 | 25.4 | WG*30, WGE30R/L |
| CGWSR/L2020-W40 | 4 | 13 | 20 | 20 | 150 | 39 | 20 | 20.4 | WG*40, WGE40R/L |
| CGWSR/L2525-W40 | 4 | 13 | 25 | 25 | 150 | 39 | 25 | 25.4 | WG*40, WGE40R/L |
| CGWSR/L2020-W50 | 5 | 13 | 20 | 20 | 150 | 39 | 20 | 20.4 | WG*50, WGE50R/L |
| CGWSR/L2525-W50 | 5 | 13 | 25 | 25 | 150 | 39 | 25 | 25.4 | WG*50, WGE50R/L |

• For applicable Insert, see page C090 - C091.

### SPARE PARTS

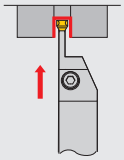


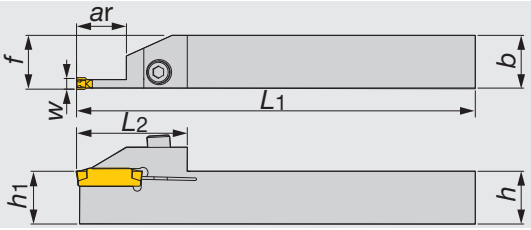


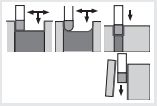
| Designation | Clamping screw | Wrench |
|---|---|---|
| CGWSR/L****-W... | CHHM5-18 | P-4 |



# MY-T SERIES
## CGWSR/L-W-L
External toolholders for deep grooving & turning





Right hand (R) shown.

| Designation | W | ar | h | b | L1 | L2 | h1 | f | Insert |
|---|---|---|---|---|---|---|---|---|---|
| CGWSR/L1616-W20-L | 2 | 15 | 16 | 16 | 125 | 37 | 16 | 16.2 | WGE20, WGE20R/L |
| CGWSR/L2020-W20-L | 2 | 15 | 20 | 20 | 150 | 37 | 20 | 20.2 | WGE20, WGE20R/L |
| CGWSR/L2525-W20-L | 2 | 15 | 25 | 25 | 150 | 37 | 25 | 25.2 | WGE20, WGE20R/L |
| CGWSR/L1616-W30-L | 3 | 16.5, 17.5 | 16 | 16 | 125 | 37 | 16 | 16.4 | WG*30, WGE30R/L |
| CGWSR/L2020-W30-L | 3 | 16.5, 17.5 | 20 | 20 | 150 | 37 | 20 | 20.4 | WG*30, WGE30R/L |
| CGWSR/L2525-W30-L | 3 | 16.5, 17.5 | 25 | 25 | 150 | 37 | 25 | 25.4 | WG*30, WGE30R/L |
| CGWSR/L2020-W40-L | 4 | 21, 21.5 | 20 | 20 | 150 | 42 | 20 | 20.4 | WG*40, WGE40R/L |
| CGWSR/L2525-W40-L | 4 | 21, 21.5 | 25 | 25 | 150 | 42 | 25 | 25.4 | WG*40, WGE40R/L |
| CGWSR/L2020-W50-L | 5 | 21 | 20 | 20 | 150 | 42 | 20 | 20.4 | WG*50, WGE50R/L |
| CGWSR/L2525-W50-L | 5 | 21 | 25 | 25 | 150 | 42 | 25 | 25.4 | WG*50, WGE50R/L |

• For applicable Insert, see page C090 - C091.

### SPARE PARTS



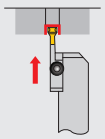


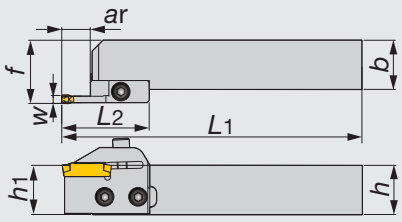
| Designation | Clamping screw | Wrench |
|---|---|---|
| CGWSR/L****-W**-L | CHHM5-18 | P-4 |

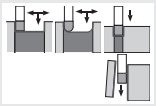
# MY-T SERIES

## CGWSR/L-WG

External toolholders for grooving & turning





Right hand (R) shown.

| Designation | W | ar | h | b | L1 | L2 | h1 | f | Insert | Shank | Blade |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CGWSR/L2020-W30GR/L | 3 | 12 | 20 | 20 | 150.5 | 43.5 | 20 | 26.9 | WG*30, WGE30R/L | CGWSR/L2020 | W30GR/L |
| CGWSR/L2525-W30GR/L | 3 | 12 | 25 | 25 | 150.5 | 43.5 | 25 | 31.9 | WG*30, WGE30R/L | CGWSR/L2525 | W30GR/L |
| CGWSR/L2020-W40GR/L | 4 | 13 | 20 | 20 | 151.5 | 44.5 | 20 | 26.9 | WG*40, WGE40R/L | CGWSR/L2020 | W40GR/L |
| CGWSR/L2525-W40GR/L | 4 | 13 | 25 | 25 | 151.5 | 44.5 | 25 | 31.9 | WG*40, WGE40R/L | CGWSR/L2525 | W40GR/L |
| CGWSR/L2020-W50GR/L | 5 | 13 | 20 | 20 | 151.5 | 44.5 | 20 | 26.9 | WG*50, WGE50R/L | CGWSR/L2020 | W50GR/L |
| CGWSR/L2525-W50GR/L | 5 | 13 | 25 | 25 | 151.5 | 44.5 | 25 | 31.9 | WG*50, WGE50R/L | CGWSR/L2525 | W50GR/L |

- When using a right or left hand blade set, the right hand blade set is used with right hand shank and the left hand blade set is used with left hand shank.
- For Applicable insert, see page C090 - C091.

### SPARE PARTS

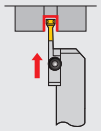
| Designation | Clamping screw | Blade screw | Wrench |
|---|---|---|---|
| CGWSR/L****-W**GR/L | CHHM5-18 | CSHB-6 | P-4 |

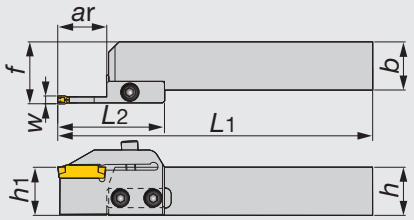


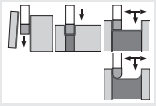
# MY-T SERIES

## CGWSR/L-WG-L

External toolholders for deep grooving & turning





Right hand (R) shown.

| Designation | W | ar | h | b | L1 | L2 | h1 | f | Insert | Shank | Blade |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CGWSR/L2020-W20GR/L-L | 2 | 15 | 20 | 20 | 153.5 | 46.5 | 20 | 26.7 | WGE20, WGE20R/L | CGWSR/L2020 | W20GR/L-L |
| CGWSR/L2525-W20GR/L-L | 2 | 15 | 25 | 25 | 153.5 | 46.5 | 25 | 31.7 | WGE20, WGE20R/L | CGWSR/L2525 | W20GR/L-L |
| CGWSR/L2020-W30GR/L-L | 3 | 16.5 - 17.5 | 20 | 20 | 157.5 | 50.5 | 20 | 26.9 | WG*30, WGE30R/L | CGWSR/L2020 | W30GR/L-L |
| CGWSR/L2525-W30GR/L-L | 3 | 16.5 - 17.5 | 25 | 25 | 157.5 | 50.5 | 25 | 31.9 | WG*30, WGE30R/L | CGWSR/L2525 | W30GR/L-L |
| CGWSR/L2020-W40GR/L-L | 4 | 21 - 21.5 | 20 | 20 | 162.5 | 55.5 | 20 | 26.9 | WG*40, WGE40R/L | CGWSR/L2020 | W40GR/L-L |
| CGWSR/L2525-W40GR/L-L | 4 | 21 - 21.5 | 25 | 25 | 162.5 | 55.5 | 25 | 31.9 | WG*40, WGE40R/L | CGWSR/L2525 | W40GR/L-L |
| CGWSR/L2020-W50GR/L-L | 5 | 21 | 20 | 20 | 162.5 | 55.5 | 20 | 26.9 | WG*50, WGE50R/L | CGWSR/L2020 | W50GR/L-L |
| CGWSR/L2525-W50GR/L-L | 5 | 21 | 25 | 25 | 162.5 | 55.5 | 25 | 31.9 | WG*50, WGE50R/L | CGWSR/L2525 | W50GR/L-L |

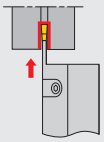
- When using a right or left hand blade set, the right hand blade set is used with right hand shank and the left hand blade set is used with left hand shank.
- For Applicable insert, see page C090 - C091.

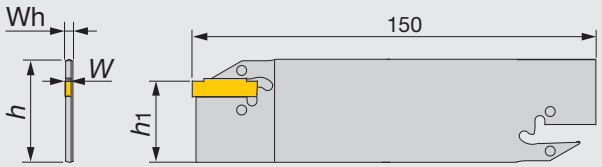
### SPARE PARTS

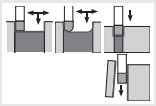
| Designation | Clamping screw | Blade screw | Wrench |
|---|---|---|---|
| CGWSR/L****-W**GR/L-L | CHHM5-18 | CSHB-6 | P-4 |

## CCH-W

Blades for parting off (2 corner)





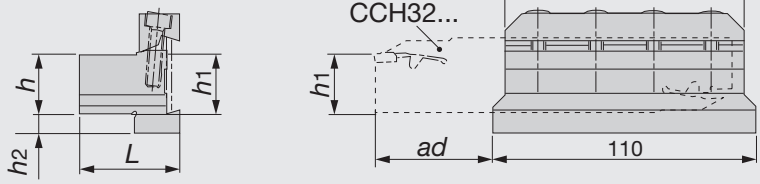



| Designation | W | Applicable insert | Max. parting off dia. | Wh | h1 | h |
|---|---|---|---|---|---|---|
| CCH32-W20 | 2 | WGE20, WGE20R/L | 33 | 1.6 | 24.6 | (32) |
| CCH32-W30 | 3 | WG*30, WGE30R/L | 33 | 2.2 | 24.6 | (32) |
| CCH32-W40 | 4 | WG*40, WGE40R/L | 42 | 3.2 | 24.5 | (32) |
| CCH32-W50 | 5 | WG*50, WGE50R/L | 42 | 4.2 | 24.3 | (32) |

• For Applicable insert, see page C090 - C091.

## CCBS-32

Tool block for CCH blades




| Designation | h | h1 | h2 | L | Blade |
|---|---|---|---|---|---|
| CCBS20-32 | 20 | 20 | 13 | 38 | CCH32... |
| CCBS25-32 | 25 | 25 | 8 | 42 | CCH32... |
| CCBS32-32 | 32 | 32 | 5 | 42 | CCH32... |

### SPARE PARTS



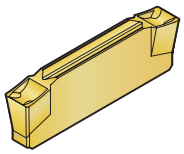


| Designation | Clamp | Screw | Wrench |
|---|---|---|---|
| CCBS**-32 | CC-32 | CM6X25 | P-5 |

# 2 corner inserts

## External grooving and parting off

### WGE

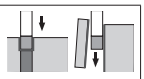


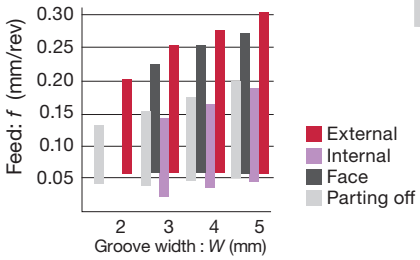
C091

1st choice for external grooving and parting

Excellent chip control for grooving

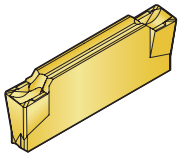
W = 2 - 5 mm






## Parting off

### WGE R/L



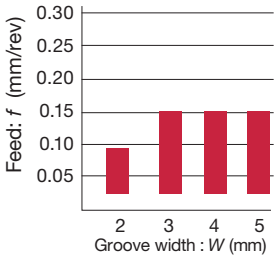
C091

Handed insert

Minimize burr generation when workpiece is cut off

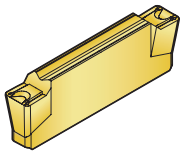
W = 2 - 5 mm






## External grooving and travesing

### WGT

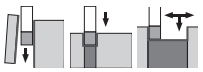


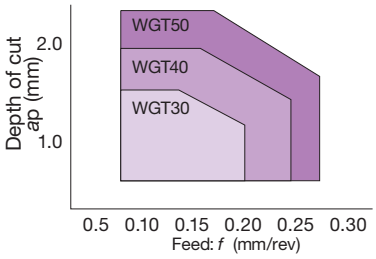
C091

1st choice for traversing

Low cutting force and good chip control for traversing

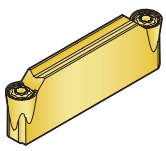
W = 3 - 5 mm






## Profiling

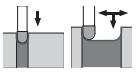
### WGR

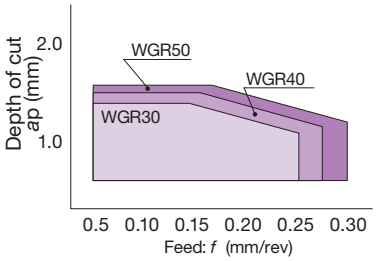


C091

Low cutting force and good chip control for profiling

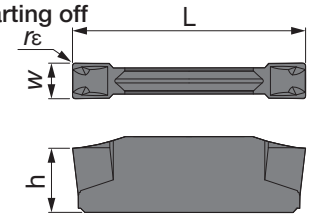
W = 3 - 5 mm





## WGE

For general parting off and grooving

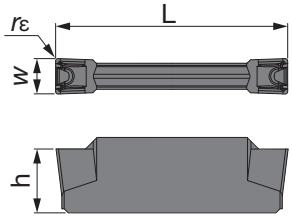



| Designation | $W^{+0.1}_{0}$ | rε | Coating | | Cermet | L | h |
|---|---|---|---|---|---|---|---|
| | | | T9125 | GH730 | NS9530 | | |
| WGE20 | 2 | 0.2 | ● | ● | ● | 20 | 4.7 |
| WGE30 | 3 | 0.2 | ● | ● | ● | 20 | 5.5 |
| WGE40 | 4 | 0.2 | ● | ● | ● | 25 | 5.7 |
| WGE50 | 5 | 0.2 | ● | ● | ● | 25 | 5.9 |

● : Line-up

## WGT

For traversing

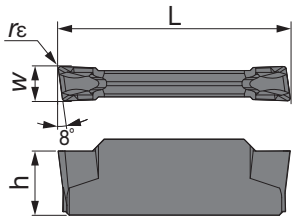



| Designation | $W^{+0.1}_{0}$ | rε | Coating | | Cermet | L | h |
|---|---|---|---|---|---|---|---|
| | | | T9125 | GH730 | NS9530 | | |
| WGT30 | 3 | 0.4 | ● | ● | ● | 20 | 5.5 |
| WGT40 | 4 | 0.4 | ● | ● | ● | 25 | 5.7 |
| WGT50 | 5 | 0.4 | ● | ● | ● | 25 | 5.9 |

● : Line-up

## WGER/L

For parting off (with hand)



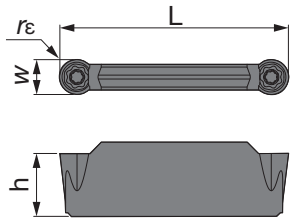

Right hand (R) shown.

| Designation | $W^{+0.1}_{0}$ | rε | Coating | | L | h |
|---|---|---|---|---|---|---|
| | | | GH730 | | | |
| | | | R | L | | |
| WGE20R/L | 2 | 0.2 | ● | ● | 20 | 4.7 |
| WGE30R/L | 3 | 0.2 | ● | ● | 20 | 5.5 |
| WGE40R/L | 4 | 0.2 | ● | ● | 25 | 5.7 |
| WGE50R/L | 5 | 0.2 | ● | ● | 25 | 5.9 |

● : Line-up

## WGR

For profiling




| Designation | $W^{+0.1}_{0}$ | rε | Coating | | Cermet | L | h |
|---|---|---|---|---|---|---|---|
| | | | T9125 | GH730 | NS9530 | | |
| WGR30 | 3 | 1.5 | ● | ● | ● | 20 | 5.5 |
| WGR40 | 4 | 2 | ● | ● | ● | 25 | 5.7 |
| WGR50 | 5 | 2.5 | | ● | ● | 25 | 5.9 |

● : Line-up



## STANDARD CUTTING CONDITIONS

| Workpiece material | Recommended grade | Cutting speed $v_C$ (m/min) |
|---|---|---|
| Low carbon steels Alloy steels ( ~ HB150) | T9125 | 80 ~ 200 |
| | NS9530 | 100 ~ 200 |
| | GH730 | 50 ~ 180 |
| Medium carbon steels Alloy steels (HB150 ~ 250) | T9125 | 80 ~ 180 |
| | NS9530 | 80 ~ 180 |
| | GH730 | 50 ~ 150 |
| High carbon steels Alloy steels (HB250 ~ ) | T9125 | 80 ~ 150 |
| | NS9530 | 80 ~ 150 |
| | GH730 | 50 ~ 120 |
| Stainless steels | T9125 | 80 ~ 150 |
| | GH730 | 50 ~ 120 |
| Grey and ductile cast irons | T9125 | 80 ~ 200 |
| | GH730 | 50 ~ 180 |

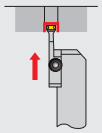
| Operation | Feed: *f* (mm/rev) Groove width: *W* (mm) | | | |
|---|---|---|---|---|
| | 2 | 3 | 4 | 5 |
| Grooving (WGE□□) | 0.06 ~ 0.20 | 0.06 ~ 0.25 | 0.07 ~ 0.27 | 0.07 ~ 0.30 |
| Parting off (WGE□□R/L) | 0.04 ~ 0.10 | 0.04 ~ 0.14 | 0.04 ~ 0.14 | 0.04 ~ 0.14 |
| Traversing (WGT□□) | - | *ap* = 0.5 ~ 1.5<br>*f* = 0.06 ~ 0.2 | *ap* = 0.5 ~ 2.0<br>*f* = 0.06 ~ 0.25 | *ap* = 0.5 ~ 2.5<br>*f* = 0.06 ~ 0.27 |
| Profiling (WGR□□) | - | *ap* = 0.5 ~ 1.4<br>*f* = 0.05 ~ 0.25 | *ap* = 0.5 ~ 1.5<br>*f* = 0.05 ~ 0.26 | *ap* = 0.5 ~ 1.6<br>*f* = 0.05 ~ 0.3 |

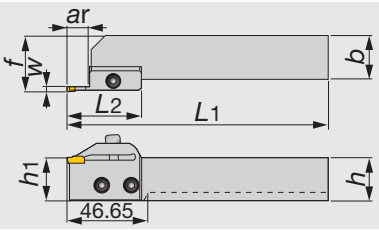
Note: For diameter compensation values in traversing, see page **C104**.

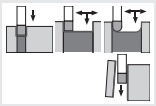
# MY-T SERIES

## CGWSR/L-G

External toolholders for grooving & turning





Right hand (R) shown.
The dashed line shows
20 mm-square shank tools.

| Designation | W | ar | h | b | L1 | L2 | h1 | f | Insert | Shank | Blade |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CGWSR/L2020-20GR/L | 2 | 12 | 20 | 20 | 150.2 | 43.15 | 20 | 26.8 | GE20, GE20-AL | CGWSR/L2020 | 20GR/L |
| CGWSR/L2525-20GR/L | 2 | 12 | 25 | 25 | 150.2 | 43.15 | 25 | 31.8 | GE20, GE20-AL | CGWSR/L2525 | 20GR/L |
| CGWSR/L2020-30GR/L | 3 | 12 | 20 | 20 | 150.2 | 43.15 | 20 | 27 | G*30,GE30R/L,GE30-AL | CGWSR/L2020 | 30GR/L |
| CGWSR/L2525-30GR/L | 3 | 12 | 25 | 25 | 150.2 | 43.15 | 25 | 32 | G*30,GE30R/L,GE30-AL | CGWSR/L2525 | 30GR/L |
| CGWSR/L2020-40GR/L | 4 | 12 | 20 | 20 | 150.2 | 43.15 | 20 | 27.1 | G*40,GE40R/L,GE40-AL | CGWSR/L2020 | 40GR/L |
| CGWSR/L2525-40GR/L | 4 | 12 | 25 | 25 | 150.2 | 43.15 | 25 | 32.1 | G*40,GE40R/L,GE40-AL | CGWSR/L2525 | 40GR/L |
| CGWSR/L2020-50GR/L | 5 | 12 | 20 | 20 | 150.2 | 43.15 | 20 | 27.2 | G*50,GE50R | CGWSR/L2020 | 50GR |

Note: For diameter compensation values in traversing, see page C104.
When using a right or left hand blade set, the right hand blade set is used with right hand shank and the left hand blade set is used with left hand shank.
For Applicable insert, see page C098 - C101.

### SPARE PARTS





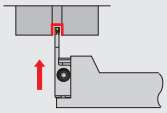
| Designation | Clamping screw | Blade screw | Wrench |
|---|---|---|---|
| CGWSR/L****-**GR/L | CHHM5-18 | CSHB-6 | P-4 |

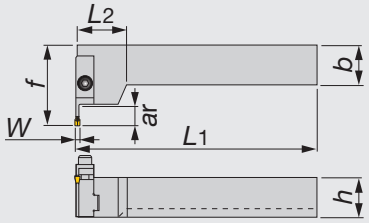
Grooving Tool

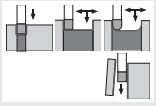
# MY-T SERIES

## CGWTR/L-G

External toolholders for grooving & turning





Right hand (R) shown.
The dashed line shows
20 mm-square shank tools.

| Designation | W | ar | h | b | L1 | L2 | f | Insert | Shank | Blade |
|---|---|---|---|---|---|---|---|---|---|---|
| CGWTR/L2020-30GL/R | 3 | 12 | 20 | 20 | 150 | 12.9 | 49.9 | G*30,GE30R/L,GE30-AL | CGWTR/L2020 | 30GL/R |
| CGWTR/L2525-30GL/R | 3 | 12 | 25 | 25 | 150 | 12.9 | 49.9 | G*30,GE30R/L,GE30-AL | CGWTR/L2525 | 30GL/R |
| CGWTR/L2020-40GL/R | 4 | 12 | 20 | 20 | 150.1 | 12.9 | 49.9 | G*40,GE40R/L,GE40-AL | CGWTR/L2020 | 40GL/R |
| CGWTR/L2525-40GL/R | 4 | 12 | 25 | 25 | 150.1 | 12.9 | 49.9 | G*40,GE40R/L,GE40-AL | CGWTR/L2525 | 40GL/R |
| CGWTR/L2020-50GL/R | 5 | 12 | 20 | 20 | 150.2 | 12.9 | 49.9 | G*50,GE50R/L,GE50-AL | CGWTR/L2020 | 50GL/R |
| CGWTR/L2525-50GL/R | 5 | 12 | 25 | 25 | 150.2 | 12.9 | 49.9 | G*50,GE50R/L,GE50-AL | CGWTR/L2525 | 50GL/R |

Note: For diameter compensation values in traversing, see page C104.
When using a right or left hand blade set, the right hand blade set is used with left hand shank and the left hand blade set is used with right hand shank.
For Applicable insert, see page C098 - C101.

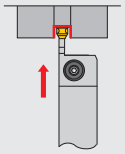
### SPARE PARTS

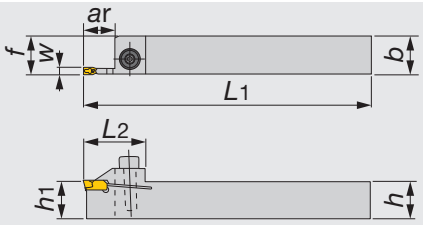


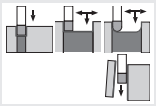


| Designation | Clamping screw | Blade screw | Wrench |
|---|---|---|---|
| CGWTR/L****-**GL/R | CHHM5-18 | CSHB-6 | P-4 |

# MY-T SERIES
## CGSSR/L
External toolholders for grooving & turning





Right hand (R) shown.

| Designation | W | ar | h | b | L1 | L2 | h1 | f | Insert |
|---|---|---|---|---|---|---|---|---|---|
| CGSSR/L1616-20 | 2 | 16 | 16 | 16 | 125 | 27 | 16 | 16.2 | GE20, GE20-AL |
| CGSSR/L2020-20 | 2 | 16 | 20 | 20 | 150 | 27 | 20 | 20.2 | GE20, GE20-AL |
| CGSSR/L2525-20 | 2 | 16 | 25 | 25 | 150 | 27 | 25 | 25.2 | GE20, GE20-AL |
| CGSSR/L1616-30 | 3 | 12 | 16 | 16 | 125 | 27 | 16 | 16.5 | G*30,GE30R/L,GE30-AL |
| CGSSR/L2020-30 | 3 | 12 | 20 | 20 | 150 | 27 | 20 | 20.5 | G*30,GE30R/L,GE30-AL |
| CGSSR/L2525-30 | 3 | 12 | 25 | 25 | 150 | 27 | 25 | 25.5 | G*30,GE30R/L,GE30-AL |
| CGSSR/L2020-40 | 4 | 12 | 20 | 20 | 150 | 27 | 20 | 20.6 | G*40,GE40R/L,GE40-AL |
| CGSSR/L2525-40 | 4 | 12 | 25 | 25 | 150 | 27 | 25 | 25.6 | G*40,GE40R/L,GE40-AL |
| CGSSR/L2020-50 | 5 | 12 | 20 | 20 | 150 | 27 | 20 | 20.7 | G*50,GE50R/L,GE50-AL |
| CGSSR/L2525-50 | 5 | 12 | 25 | 25 | 150 | 27 | 25 | 25.7 | G*50,GE50R/L,GE50-AL |

Note: For Applicable insert, see page C098 - C101.

### SPARE PARTS

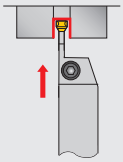


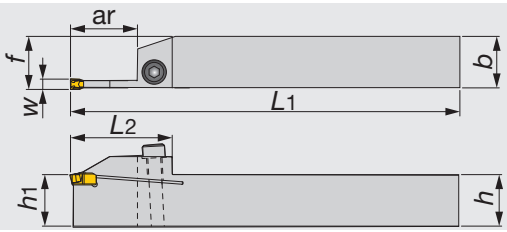


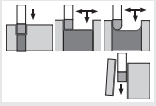
| Designation | Clamping screw | Wrench |
|---|---|---|
| CGSSR/L... | CHHM5-18 | P-4 |



# MY-T SERIES
## CGSSR/L-D
External toolholders for deep grooving & turning





Right hand (R) shown.

| Designation | W | ar | h | b | L1 | L2 | h1 | f | Insert |
|---|---|---|---|---|---|---|---|---|---|
| CGSSR/L1616-30D | 3 | 22 | 16 | 16 | 125 | 36.2 | 16 | 16.5 | G*30,GE30R/L,GE30-AL |
| CGSSR/L2020-30D | 3 | 22 | 20 | 20 | 150 | 36.2 | 20 | 20.5 | G*30,GE30R/L,GE30-AL |
| CGSSR/L2525-30D | 3 | 22 | 25 | 25 | 150 | 36.2 | 25 | 25.5 | G*30,GE30R/L,GE30-AL |
| CGSSR/L2020-40D | 4 | 25 | 20 | 20 | 150 | 39.5 | 20 | 20.6 | G*40,GE40R/L,GE40-AL |
| CGSSR/L2525-40D | 4 | 25 | 25 | 25 | 150 | 39.5 | 25 | 25.6 | G*40,GE40R/L,GE40-AL |
| CGSSR/L2020-50D | 5 | 25 | 20 | 20 | 150 | 39.5 | 20 | 20.7 | G*50,GE50R/L |
| CGSSR/L2525-50D | 5 | 25 | 25 | 25 | 150 | 39.5 | 25 | 25.7 | G*50,GE50R/L |

Note: For Applicable insert, see page C098 - C101.

### SPARE PARTS



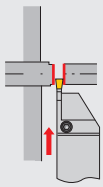


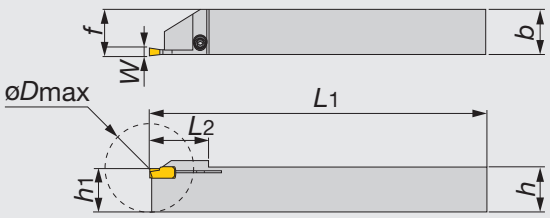
| Designation | Clamping screw | Wrench |
|---|---|---|
| CGSSR/L****-**D | CHHM5-18 | P-4 |

# MY-T SERIES

## JCGSSR/L

External grooving toolholders for swiss lathe






Right hand (R) shown.

| Designation | W | øDmax | h | b | L1 | L2 | h1 | f | Insert |
|---|---|---|---|---|---|---|---|---|---|
| JCGSSR/L1010-20 | 2 | 20 | 10 | 10 | 125 | 15 | 10 | 10.2 | GE20, GE20-AL |
| JCGSSR/L1212-20 | 2 | 25 | 12 | 12 | 125 | 19 | 12 | 12.2 | GE20, GE20-AL |
| JCGSSR/L1616-20 | 2 | 32 | 16 | 16 | 125 | 22.5 | 16 | 16.2 | GE20, GE20-AL |

• øDmax: Max. parting off diameter • For Applicable insert, see page C098 - C101.

**SPARE PARTS**

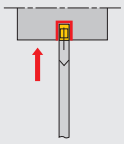
| Designation | Clamping screw | Wrench |
|---|---|---|
| JCGSSR/L... | CSTB-3 | T-9F |

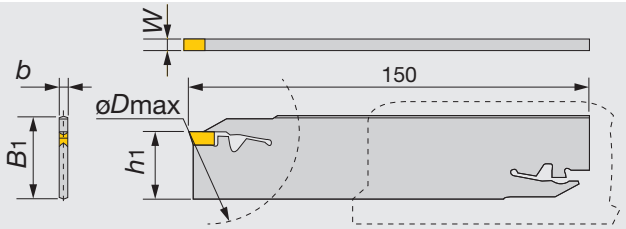
Grooving Tool

# MY-T SERIES

## CCH

Blades for parting off (for 1 corner insert)






| Designation | W | øDmax | b | h1 | B1 | Insert |
|---|---|---|---|---|---|---|
| CCH32-30 | 3 | 100 | 2.2 | 24.6 | 31.31 | GE30,GE30R/L,GE30-AL |
| CCH32-40 | 4 | 100 | 3.2 | 24.5 | 31.04 | GE40,GE40R/L,GE40-AL |
| CCH32-50 | 5 | 120 | 4.2 | 24.3 | 30.77 | GE50,GE50R/L,GE50-AL |

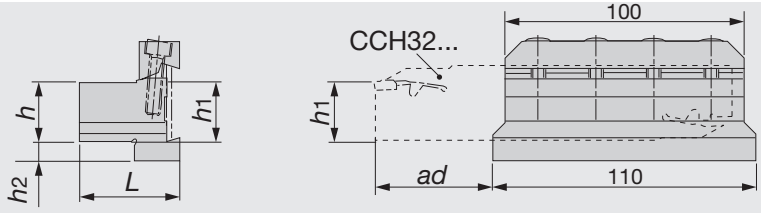
• øDmax: Max. parting off diameter • For Applicable insert, see page C098 - C101.

**SPARE PARTS**

| Designation | Wrench |
|---|---|
| CCH... | CTL-2 |

## CCBS-32

Tool block for CCH blades




| Designation | h | h1 | h2 | L | Blade |
|---|---|---|---|---|---|
| CCBS20-32 | 20 | 20 | 13 | 38 | CCH32... |
| CCBS25-32 | 25 | 25 | 8 | 42 | CCH32... |
| CCBS32-32 | 32 | 32 | 5 | 42 | CCH32... |

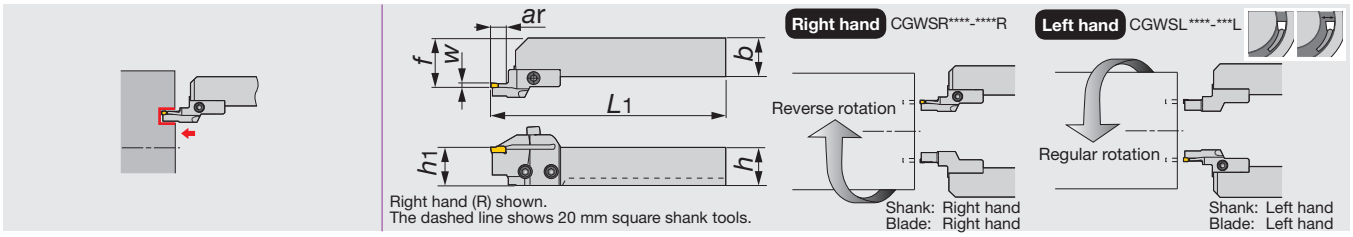
**SPARE PARTS**

| Designation | Clamp | Screw | Wrench |
|---|---|---|---|
| CCBS**-32 | CC-32 | CM6X25 | P-5 |

# MY-T SERIES

## #S/D##R/L+CGWSR/L

Blades of "My-T" toolholders CGWSR/L-#S/D & CGWTR/L-#S/D for face grooving & turning




| Designation | W | øDm | øDmax | ar | h | b | L1 | h1 | f | Insert | Shank |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 30S3040R/L | 3 | 30 | 40 | 10 | 20/25 | 20/25 | 152.5 | 20/25 | 27/32 | G*30, GE30-AL | CGWSR/L... |
| 30S4050R/L | 3 | 40 | 50 | 10 | 20/25 | 20/25 | 152.5 | 20/25 | 27/32 | G*30, GE30-AL | CGWSR/L... |
| 30S5065R/L | 3 | 50 | 65 | 10 | 20/25 | 20/25 | 152.5 | 20/25 | 27/32 | G*30, GE30-AL | CGWSR/L... |
| 30S6590R/L | 3 | 65 | 90 | 10 | 20/25 | 20/25 | 152.5 | 20/25 | 27/32 | G*30, GE30-AL | CGWSR/L... |
| 30S90150R/L | 3 | 90 | 150 | 10 | 20/25 | 20/25 | 152.5 | 20/25 | 27/32 | G*30, GE30-AL | CGWSR/L... |
| 30S150500R/L | 3 | 150 | 500 | 10 | 20/25 | 20/25 | 152.5 | 20/25 | 27/32 | G*30, GE30-AL | CGWSR/L... |
| 40S3545R/L | 4 | 35 | 45 | 14 | 20/25 | 20/25 | 152.5 | 20/25 | 27/32 | G*40, GE40-AL | CGWSR/L... |
| 40S4555R/L | 4 | 45 | 55 | 14 | 20/25 | 20/25 | 152.5 | 20/25 | 27/32 | G*40, GE40-AL | CGWSR/L... |
| 40S5580R/L | 4 | 55 | 80 | 14 | 20/25 | 20/25 | 152.5 | 20/25 | 27/32 | G*40, GE40-AL | CGWSR/L... |
| 40S80140R/L | 4 | 80 | 140 | 14 | 20/25 | 20/25 | 152.5 | 20/25 | 27/32 | G*40, GE40-AL | CGWSR/L... |
| 40S140500R/L | 4 | 140 | 500 | 14 | 20/25 | 20/25 | 152.5 | 20/25 | 27/32 | G*40, GE40-AL | CGWSR/L... |
| 40D3545R/L | 4 | 35 | 45 | 22 | 20/25 | 20/25 | 160.5 | 20/25 | 27/32 | G*40, GE40-AL | CGWSR/L... |
| 40D4555R/L | 4 | 45 | 55 | 22 | 20/25 | 20/25 | 160.5 | 20/25 | 27/32 | G*40, GE40-AL | CGWSR/L... |
| 40D5580R/L | 4 | 55 | 80 | 22 | 20/25 | 20/25 | 160.5 | 20/25 | 27/32 | G*40, GE40-AL | CGWSR/L... |
| 40D80140R/L | 4 | 80 | 140 | 22 | 20/25 | 20/25 | 160.5 | 20/25 | 27/32 | G*40, GE40-AL | CGWSR/L... |
| 40D140500R/L | 4 | 140 | 500 | 22 | 20/25 | 20/25 | 160.5 | 20/25 | 27/32 | G*40, GE40-AL | CGWSR/L... |
| 50S3545R/L | 5 | 35 | 45 | 14 | 20/25 | 20/25 | 152.5 | 20/25 | 27/32 | G*50 | CGWSR/L... |
| 50S4555R/L | 5 | 45 | 55 | 14 | 20/25 | 20/25 | 152.5 | 20/25 | 27/32 | G*50 | CGWSR/L... |
| 50S5575R/L | 5 | 55 | 75 | 14 | 20/25 | 20/25 | 152.5 | 20/25 | 27/32 | G*50 | CGWSR/L... |
| 50S75130R/L | 5 | 75 | 130 | 14 | 20/25 | 20/25 | 152.5 | 20/25 | 27/32 | G*50 | CGWSR/L... |
| 50S130500R/L | 5 | 130 | 500 | 14 | 20/25 | 20/25 | 152.5 | 20/25 | 27/32 | G*50 | CGWSR/L... |
| 50D3545R/L | 5 | 35 | 45 | 22 | 20/25 | 20/25 | 160.5 | 20/25 | 27/32 | G*50 | CGWSR/L... |
| 50D4555R/L | 5 | 45 | 55 | 22 | 20/25 | 20/25 | 160.5 | 20/25 | 27/32 | G*50 | CGWSR/L... |
| 50D5575R/L | 5 | 55 | 75 | 22 | 20/25 | 20/25 | 160.5 | 20/25 | 27/32 | G*50 | CGWSR/L... |
| 50D75130R/L | 5 | 75 | 130 | 22 | 20/25 | 20/25 | 160.5 | 20/25 | 27/32 | G*50 | CGWSR/L... |
| 50D130500R/L | 5 | 130 | 500 | 22 | 20/25 | 20/25 | 160.5 | 20/25 | 27/32 | G*50 | CGWSR/L... |

- There are 2 shank type of CGWSR/L and CGWTR/L.
- CGWSR/L Shank : The right hand blade set(...R) is used with right hand shank(CGWSR...) and the left hand blade set(...L) is used with left hand shank(CGWSL...).
- CGWTR/L Shank : The left hand blade set(...L)is used with right hand shank(CGWTR...) and the right hand blade set(...R)is used with left hand shank(CGWTL...).
- For Applicable insert, see page C098 - C101.

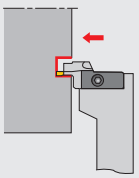
### SPARE PARTS

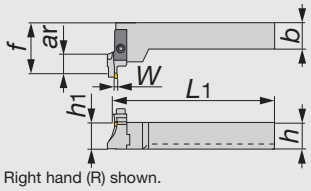
| Designation | Clamping screw | Blade screw | Wrench |
|---|---|---|---|
| 30S... | CHHM5-18 | CSHB-6 | P-4 |
| 40D... | CM5X0.8X16 | CSHB-6 | P-4 |
| 50S... | CHHM5-18 | CSHB-6 | P-4 |
| 50D... | CM5X0.8X16 | CSHB-6 | P-4 |

# MY-T SERIES

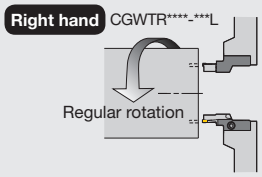
## #S/D##R/L+CGWTR/L

Blades of "My-T" toolholders CGWSR/L-#S/D & CGWTR/L-#S/D for face grooving & turning

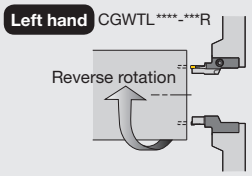





Right hand (R) shown.
The dashed line shows 20 mm square shank tools.




Shank: Right hand
Blade: Left hand




Shank: Left hand
Blade: Right hand

| Designation | W | øDm | øDmax | ar | h | b | L1 | h1 | f | Insert | Shank |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 30S3040R/L | 3 | 30 | 40 | 10 | 20/25 | 20/25 | 150 | 20/25 | 52.25 | G*30, GE30-AL | CGWTL/R... |
| 30S4050R/L | 3 | 40 | 50 | 10 | 20/25 | 20/25 | 150 | 20/25 | 52.25 | G*30, GE30-AL | CGWTL/R... |
| 30S5065R/L | 3 | 50 | 65 | 10 | 20/25 | 20/25 | 150 | 20/25 | 52.25 | G*30, GE30-AL | CGWTL/R... |
| 30S6590R/L | 3 | 65 | 90 | 10 | 20/25 | 20/25 | 150 | 20/25 | 52.25 | G*30, GE30-AL | CGWTL/R... |
| 30S90150R/L | 3 | 90 | 150 | 10 | 20/25 | 20/25 | 150 | 20/25 | 52.25 | G*30, GE30-AL | CGWTL/R... |
| 30S150500R/L | 3 | 150 | 500 | 10 | 20/25 | 20/25 | 150 | 20/25 | 52.25 | G*30, GE30-AL | CGWTL/R... |
| 40S3545R/L | 4 | 35 | 45 | 14 | 20/25 | 20/25 | 150 | 20/25 | 52.25 | G*40, GE40-AL | CGWTL/R... |
| 40S4555R/L | 4 | 45 | 55 | 14 | 20/25 | 20/25 | 150 | 20/25 | 52.25 | G*40, GE40-AL | CGWTL/R... |
| 40S5580R/L | 4 | 55 | 80 | 14 | 20/25 | 20/25 | 150 | 20/25 | 52.25 | G*40, GE40-AL | CGWTL/R... |
| 40S80140R/L | 4 | 80 | 140 | 14 | 20/25 | 20/25 | 150 | 20/25 | 52.25 | G*40, GE40-AL | CGWTL/R... |
| 40S140500R/L | 4 | 140 | 500 | 14 | 20/25 | 20/25 | 150 | 20/25 | 52.25 | G*40, GE40-AL | CGWTL/R... |
| 40D3545R/L | 4 | 35 | 45 | 22 | 20/25 | 20/25 | 150 | 20/25 | 60.25 | G*40, GE40-AL | CGWTL/R... |
| 40D4555R/L | 4 | 45 | 55 | 22 | 20/25 | 20/25 | 150 | 20/25 | 60.25 | G*40, GE40-AL | CGWTL/R... |
| 40D5580R/L | 4 | 55 | 80 | 22 | 20/25 | 20/25 | 150 | 20/25 | 60.25 | G*40, GE40-AL | CGWTL/R... |
| 40D80140R/L | 4 | 80 | 140 | 22 | 20/25 | 20/25 | 150 | 20/25 | 60.25 | G*40, GE40-AL | CGWTL/R... |
| 40D140500R/L | 4 | 140 | 500 | 22 | 20/25 | 20/25 | 150 | 20/25 | 60.25 | G*40, GE40-AL | CGWTL/R... |
| 50S3545R/L | 5 | 35 | 45 | 14 | 20/25 | 20/25 | 150 | 20/25 | 52.25 | G*50 | CGWTL/R... |
| 50S4555R/L | 5 | 45 | 55 | 14 | 20/25 | 20/25 | 150 | 20/25 | 52.25 | G*50 | CGWTL/R... |
| 50S5575R/L | 5 | 55 | 75 | 14 | 20/25 | 20/25 | 150 | 20/25 | 52.25 | G*50 | CGWTL/R... |
| 50S75130R/L | 5 | 75 | 130 | 14 | 20/25 | 20/25 | 150 | 20/25 | 52.25 | G*50 | CGWTL/R... |
| 50S130500R/L | 5 | 130 | 500 | 14 | 20/25 | 20/25 | 150 | 20/25 | 52.25 | G*50 | CGWTL/R... |
| 50D3545R/L | 5 | 35 | 45 | 22 | 20/25 | 20/25 | 150 | 20/25 | 60.25 | G*50 | CGWTL/R... |
| 50D4555R/L | 5 | 45 | 55 | 22 | 20/25 | 20/25 | 150 | 20/25 | 60.25 | G*50 | CGWTL/R... |
| 50D5575R/L | 5 | 55 | 75 | 22 | 20/25 | 20/25 | 150 | 20/25 | 60.25 | G*50 | CGWTL/R... |
| 50D75130R/L | 5 | 75 | 130 | 22 | 20/25 | 20/25 | 150 | 20/25 | 60.25 | G*50 | CGWTL/R... |
| 50D130500R/L | 5 | 130 | 500 | 22 | 20/25 | 20/25 | 150 | 20/25 | 60.25 | G*50 | CGWTL/R... |

- There are 2 shank type of CGWSR/L and CGWTR/L.
- CGWSR/L Shank : The right hand blade set(...R) is used with right hand shank(CGWSR...) and the left hand blade set(...L) is used with left hand shank(CGWSL...).
- CGWTR/L Shank : The left hand blade set(...L)is used with right hand shank(CGWTR...) and the right hand blade set(...R)is used with left hand shank(CGWTL...).
- For Applicable insert, see page C098 - C101.

### SPARE PARTS

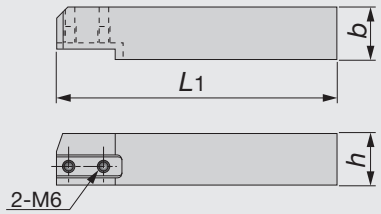




| Designation | Clamping screw | Blade screw | Wrench |
|---|---|---|---|
| 30S... | CHHM5-18 | CSHB-6 | P-4 |
| 40D... | CM5X0.8X16 | CSHB-6 | P-4 |
| 50S... | CHHM5-18 | CSHB-6 | P-4 |
| 50D... | CM5X0.8X16 | CSHB-6 | P-4 |

# MY-T SERIES
## CGWSR/L

Shank of toolholders CGWSR/L-WG, -WG-L, -G, -CGD, -FL-G/TP & -#S/D




Right hand (R) shown.

| Designation | h | b | L1 |
|---|---|---|---|
| CGWSR/L2020 | 20 | 20 | 137 |
| CGWSR/L2525 | 25 | 25 | 137 |

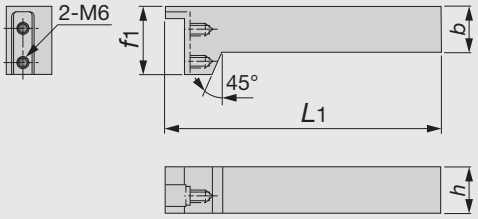
**SPARE PARTS**



| Designation | Blade screw |
|---|---|
| CGWSR/L... | CSHB-6 |

# MY-T SERIES
## CGWTR/L

Shank of perpendicular toolholders CGWTR/L-G, -CGD, -FL & -#S/D




Right hand (R) shown.

| Designation | h | b | L1 | f1 |
|---|---|---|---|---|
| CGWTR/L2020 | 20 | 20 | 150 | 37 |
| CGWTR/L2525 | 25 | 25 | 150 | 37 |

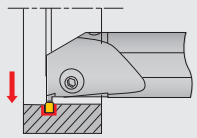
**SPARE PARTS**

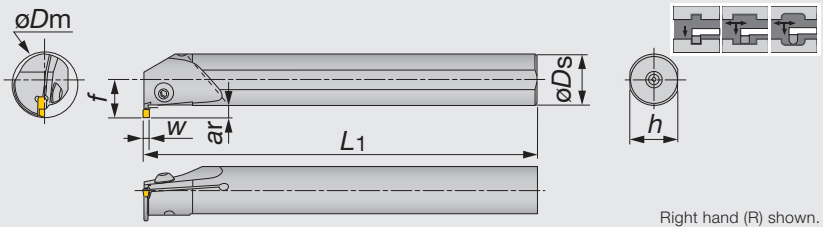


| Designation | Blade screw |
|---|---|
| CGWTR/L... | CSHB-6 |

# MY-T SERIES
## CGTR/L

Toolholders for internal grooving






Right hand (R) shown.

| Designation | W | øDm | ar | øDs | f | L1 | h | Insert |
|---|---|---|---|---|---|---|---|---|
| S20Q-CGTR/L30 | 3 | 25 | 3.5 | 20 | 14.5 | 180 | 18 | G*30, GE30-AL |
| S25R-CGTR/L30 | 3 | 32 | 5 | 25 | 18.5 | 200 | 23 | G*30, GE30-AL |
| S25R-CGTR/L40 | 4 | 32 | 5 | 25 | 18.5 | 200 | 23 | G*40, GE40-AL |
| S32S-CGTR/L40 | 4 | 40 | 6 | 32 | 23 | 250 | 30 | G*40, GE40-AL |
| S25R-CGTR/L50 | 5 | 32 | 5 | 25 | 18.5 | 200 | 23 | G*50 |
| S32S-CGTR/L50 | 5 | 40 | 6 | 32 | 23 | 250 | 30 | G*50 |

• For Applicable insert, see page C098 - C101.

**SPARE PARTS**

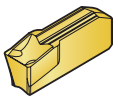



| Designation | Clamping screw | Wrench |
|---|---|---|
| S***-CGTR/L... | BHM5-14 | P-3 |

# 1 corner inserts

## External grooving and parting off

**GE**

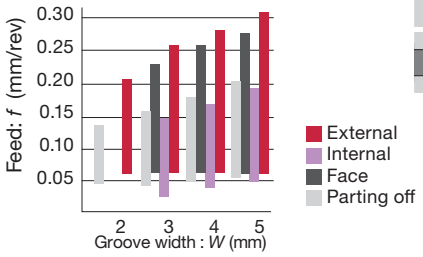


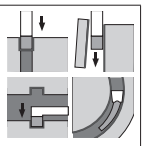
C100

1st choice for external grooving and parting

Excellent chip control for grooving

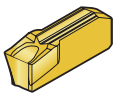
W = 2 - 5 mm



## Parting off

**GE R/L**

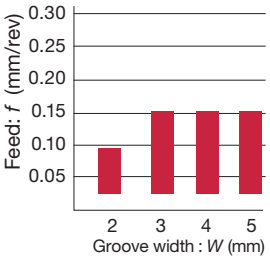


C100

Handed insert

Minimize burr generation when workpiece is cut off

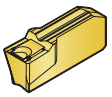
W = 3 - 5 mm






## Grooving and travesing

**GT**

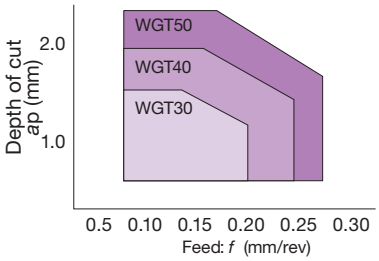


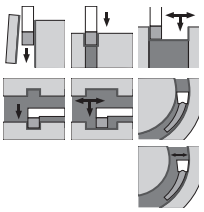
C100

1st choice for traversing

Low cutting force and good chip control for traversing

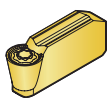
W = 3 - 5 mm



## Profiling

**GR**

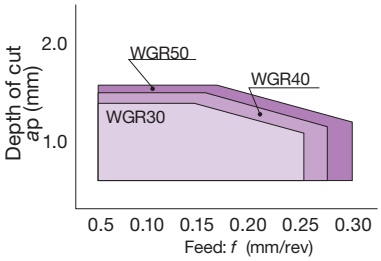


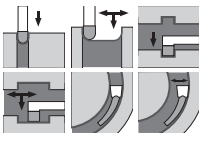
C100

Full radius type

Low cutting force and good chip control for profiling

W = 3 - 5 mm

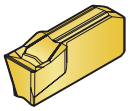


# 1 corner inserts

## Face grooving

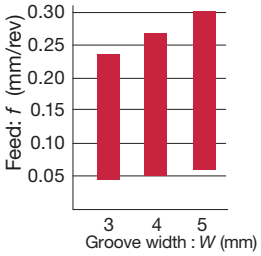
**GF**

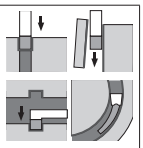


C100

1st choice for face grooving

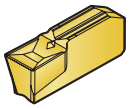
Low cutting force and good chip control for face grooving
W = 3 - 5 mm



## Internal grooving

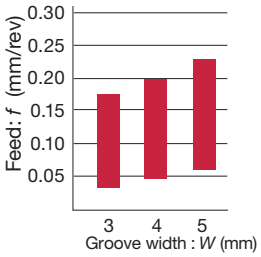
**GN**

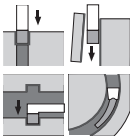


C100

1st choice for internal grooving

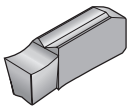
Low cutting force and good chip control for internal grooving
W = 3 - 5 mm



## For non-ferrous materials

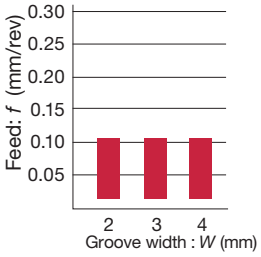
**GE-AL**

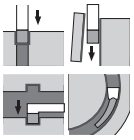


C100

Reduce cutting force and welding due to sharp chipbreaker

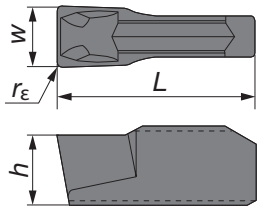
W = 2 - 4 mm



## GE

For general grooving

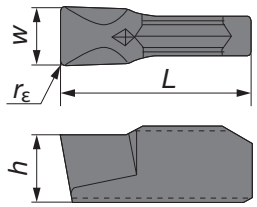



| Designation | $W^{+0.1}_{0}$ | rε | Coating | | Cermet | L | h |
|---|---|---|---|---|---|---|---|
| | | | T9125 | GH730 | NS9530 | | |
| GE20 | 2 | 0.2 | | ● | ● | 10 | 3.5 |
| GE30 | 3 | 0.2 | ● | ● | ● | 10 | 3.5 |
| GE40 | 4 | 0.2 | ● | ● | ● | 10 | 4 |
| GE50 | 5 | 0.2 | ● | ● | ● | 12 | 4.5 |

● : Line-up

## GN

For internal grooving

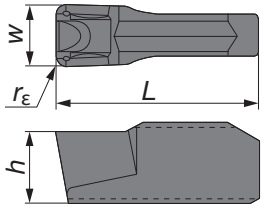



| Designation | $W^{+0.1}_{0}$ | rε | Coating | L | h |
|---|---|---|---|---|---|
| | | | GH730 | | |
| GN30 | 3 | 0.2 | ● | 10 | 3.5 |
| GN40 | 4 | 0.2 | ● | 10 | 4 |
| GN50 | 5 | 0.2 | ● | 12 | 4.5 |

● : Line-up

## GT

For traversing

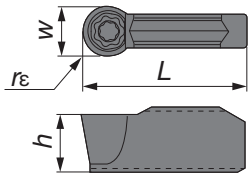



| Designation | $W^{+0.1}_{0}$ | rε | Coating | | Cermet | L | h |
|---|---|---|---|---|---|---|---|
| | | | T9125 | GH730 | NS9530 | | |
| GT30 | 3 | 0.4 | | ● | ● | 10 | 3.5 |
| GT40 | 4 | 0.4 | | ● | ● | 10 | 4 |
| GT50 | 5 | 0.4 | ● | ● | ● | 12 | 4.5 |

● : Line-up

## GR

For profiling

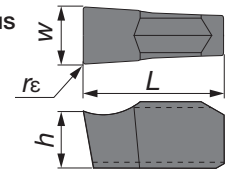



| Designation | $W^{+0.1}_{0}$ | rε | Coating | | Cermet | L | h |
|---|---|---|---|---|---|---|---|
| | | | T9125 | GH730 | NS9530 | | |
| GR30 | 3 | 1.5 | | ● | ● | 10 | 3.5 |
| GR40 | 4 | 2.0 | ● | ● | ● | 10 | 4 |
| GR50 | 5 | 2.5 | ● | ● | ● | 12 | 4.5 |

● : Line-up

## GE-AL

For aluminium and non-ferrous metals

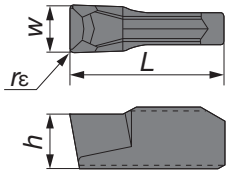



| Designation | $W^{\pm 0.025}$ | rε | Uncoated | L | h |
|---|---|---|---|---|---|
| | | | KS05F | | |
| GE20-AL | 2 | 0.2 | ● | 10 | 3.5 |
| GE30-AL | 3 | 0.2 | ● | 10 | 3.5 |
| GE40-AL | 4 | 0.2 | ● | 10 | 4 |

● : Line-up

## GF

For face grooving (Improved chip control)

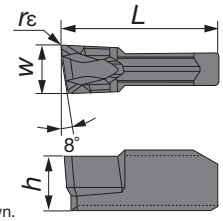



| Designation | $W^{+0.1}_{0}$ | rε | Coating | Cermet | L | h |
|---|---|---|---|---|---|---|
| | | | GH730 | NS9530 | | |
| GF30 | 3 | 0.2 | ● | ● | 10 | 3.5 |
| GF40 | 4 | 0.2 | ● | ● | 10 | 4 |
| GF50 | 5 | 0.2 | ● | ● | 12 | 4.5 |

● : Line-up

## GE-R/L

For parting off (handed insert)




Right hand (R) shown.

| Designation | $W^{+0.1}_{0}$ | rε | Coating | L | h |
|---|---|---|---|---|---|
| | | | GH730 | | |
| GE30R/L | 3 | 0.2 | ● | 10 | 3.5 |
| GE40R/L | 4 | 0.2 | ● | 10 | 4 |
| GE50R/L | 5 | 0.2 | ● | 12 | 4.5 |

● : Line-up

## STANDARD CUTTING CONDITIONS

| Workpiece material | Recommended grade | Cutting speed $v_c$ (m/min) |
|---|---|---|
| Low carbon steels<br>Alloy steels ( ~ HB150) | T9125 | 80 - 200 |
| | NS9530 | 100 - 200 |
| | GH730 | 50 - 180 |
| Medium carbon steels<br>Alloy steels (HB150 ~ 250) | T9125 | 80 - 180 |
| | NS9530 | 80 - 180 |
| | GH730 | 50 - 150 |
| High carbon steels<br>Alloy steels (HB250 ~ ) | T9125 | 80 - 150 |
| | NS9530 | 80 - 150 |
| | GH730 | 50 - 120 |
| Stainless steels | T9125 | 80 - 150 |
| | GH730 | 50 - 120 |
| Grey and ductile cast irons | T9125 | 80 - 200 |
| | GH730 | 50 - 180 |
| Aluminium alloys, Non-ferrous metals | KS05F | 200 - 300 |

### For External

| Operation | Feed: *f* (mm/rev)<br>Groove width: *W* (mm) | | | |
|---|---|---|---|---|
| | 2 | 3 | 4 | 5 |
| Grooving<br>(GE**) | 0.06 - 0.2 | 0.06 - 0.25 | 0.07 - 0.27 | 0.07 - 0.3 |
| Parting off<br>(GE**R/L) | 0.04 - 0.1 | 0.04 - 0.14 | 0.04 - 0.14 | 0.04 - 0.14 |
| Traversing<br>(GT**) | - | Depth of cut<br>*ap* = 0.5 - 1.5<br>*f* = 0.06 - 0.2 | Depth of cut<br>*ap* = 0.5 - 2<br>*f* = 0.06 - 0.25 | Depth of cut<br>*ap* = 0.5 - 2.5<br>*f* = 0.06 - 0.27 |
| Profi ling<br>(GR**) | - | Depth of cut<br>*ap* = 0.5 - 1.4<br>*f* = 0.05 - 0.25 | Depth of cut<br>*ap* = 0.5 - 1.5<br>*f* = 0.05 - 0.26 | Depth of cut<br>*ap* = 0.5 - 1.6<br>*f* = 0.05 - 0.3 |
| Grooving for Aluminium alloys<br>(GE**-AL) | 0.03 - 0.1 | 0.03 - 0.1 | 0.03 - 0.1 | - |

Note: For diameter compensation values in traversing, see page **C104**.

### For Face

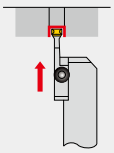
| Operation | Feed: *f* (mm/rev)<br>Groove width: *W* (mm) | | |
|---|---|---|---|
| | 3 | 4 | 5 |
| Face grooving<br>(GE**) | 0.06 - 0.22 | 0.06 - 0.24 | 0.07 - 0.26 |
| Face grooving<br>(GF**) | 0.04 - 0.25 | 0.05 ~ 0.26 | 0.05 - 0.30 |
| Face traversing<br>(GT**) | Depth of cut<br>*ap* = 0.5 - 1.5<br>*f* = 0.06 - 0.2 | Depth of cut<br>*ap* = 0.5 - 2<br>*f* = 0.06 - 0.25 | Depth of cut<br>*ap* = 0.5 - 2.5<br>*f* = 0.06 - 0.27 |
| Face traversing<br>(GR**) | Depth of cut<br>ap = 0.5 - 1.4<br>*f* = 0.05 - 0.25 | Depth of cut<br>ap = 0.5 - 1.5<br>*f* = 0.05 - 0.26 | Depth of cut<br>ap = 0.5 - 1.6<br>*f* = 0.05 - 0.3 |
| Face grooving for aluminium alloys<br>(GE**-AL) | 0.03 - 0.1 | 0.03 - 0.1 | - |

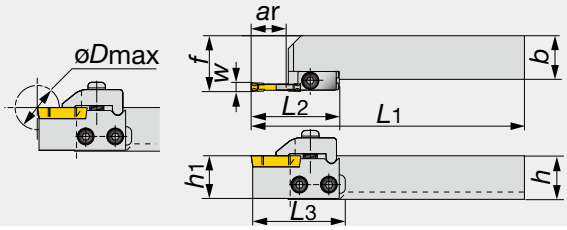
Notes:
- For diameter compensation values in traversing, see page **C104**.
- For occurrence of vibrations in face traversing, set the feed to the lower side of the values show in the above table.

### For Internal

| Operation | Feed: *f* (mm/rev)<br>Groove width: *W* (mm) | | |
|---|---|---|---|
| | 3 | 4 | 5 |
| Face grooving<br>(GE**) | 0.04 - 0.14 | 0.05 - 0.15 | 0.05 - 0.16 |
| Face grooving<br>(GN**) | 0.04 - 0.16 | 0.05 - 0.18 | 0.05 - 0.2 |
| Face traversing<br>(GT**) | *ap* = 0.5 - 1.5<br>*f* = 0.06 - 0.2 | *ap* = 0.5 - 2<br>*f* = 0.06 - 0.25 | *ap* = 0.5 - 2.5<br>*f* = 0.06 - 0.27 |
| Face traversing<br>(GR**) | *ap* = 0.5 - 1.4<br>*f* = 0.05 - 0.25 | *ap* = 0.5 - 1.5<br>*f* = 0.05 - 0.26 | *ap* = 0.5 - 1.6<br>*f* = 0.05 - 0.3 |
| Face grooving for aluminium alloys<br>(GE**-AL) | 0.03 ~ 0.1 | 0.03 ~ 0.1 | - |

Notes:
- For diameter compensation values in traversing, see page **C104**.
- For occurrence of vibrations in face traversing, set the feed to the lower side of the values show in the above table.








Right hand (R) shown.
The dashed line shows
20 mm-square shank tools.

| Designation | W | øDmax | ar | h | b | L1 | L2 | L3 | h1 | f | Insert | Shank | Blade |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CGWSR/L2020-CGDR/L2 | 2 | 35 | 16 | 20 | 20 | 152 | 45 | 48.5 | 20 | 26.45 | CGD200 | CGWSR/L2020 | CGDR/L2 |
| CGWSR/L2525-CGDR/L2 | 2 | 35 | 16 | 25 | 25 | 152 | 45 | - | 25 | 31.45 | CGD200 | CGWSR/L2525 | CGDR/L2 |
| CGWSR/L2020-CGDR/L3 | 3 | 46 | 21.6 | 20 | 20 | 157.6 | 50.6 | 54.1 | 20 | 26.45 | CGD300 | CGWSR/L2020 | CGDR/L3 |
| CGWSR/L2525-CGDR/L3 | 3 | 46 | 21.6 | 25 | 25 | 157.6 | 50.6 | - | 25 | 31.45 | CGD300 | CGWSR/L2525 | CGDR/L3 |
| CGWSR/L2020-CGDR/L4 | 4 | 46 | 21.6 | 20 | 20 | 157.6 | 50.6 | 54.1 | 20 | 26.65 | CGD400 | CGWSR/L2020 | CGDR/L4 |
| CGWSR/L2525-CGDR/L4 | 4 | 46 | 21.6 | 25 | 25 | 157.6 | 50.6 | - | 25 | 31.65 | CGD400 | CGWSR/L2525 | CGDR/L4 |
| CGWSR/L2020-CGDR/L5 | 5 | 46 | 21.6 | 20 | 20 | 157.6 | 50.6 | 54.1 | 20 | 26.95 | CGD500 | CGWSR/L2020 | CGDR/L5 |
| CGWSR/L2525-CGDR/L5 | 5 | 46 | 21.6 | 25 | 25 | 157.6 | 50.6 | - | 25. | 31.95 | CGD500 | CGWSR/L2525 | CGDR/L5 |
| CGWSR/L2020-CGDR/L6 | 6 | 46 | 21.6 | 20 | 20 | 157.6 | 50.6 | 54.1 | 20 | 27.1 | CGD600 | CGWSR/L2020 | CGDR/L6 |
| CGWSR/L2525-CGDR/L6 | 6 | 46 | 21.6 | 25 | 25 | 157.6 | 50.6 | - | 25 | 32.1 | CGD600 | CGWSR/L2525 | CGDR/L6 |
| CGWSR2525-8 | 7 / 8 | 50 | 21.6 | 25 | 25 | 150 | - | - | 25 | 26.35 | CGD700, CGD800 | - | - |
| CGWSR3232-8 | 7 / 8 | 50 | 21.6 | 32 | 32 | 170 | - | - | 32 | 33.35 | CGD700, CGD800 | - | - |

When using a right or left hand blade set, the right hand blade set is used with right hand shank and the left hand blade set is used with left hand shank.

## SPARE PARTS



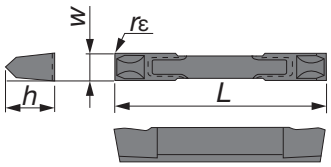




| Designation | Blade | Clamp | Clamping screw | Blade screw | Spring pin | Spring | Wrench |
|---|---|---|---|---|---|---|---|
| CGWSR****-CGDR2 | TCR2 | CCR2 | RT-1 | CSHB-6 | - | BP-9 | P-4 |
| CGWSL****-CGDL2 | TCL2 | CCL2 | RT-1 | CSHB-6 | - | BP-9 | P-4 |
| CGWSR****-CGDR3 | TCR3 | CCR3 | RT-1 | CSHB-6 | - | BP-9 | P-4 |
| CGWSL****-CGDL3 | TCL3 | CCL3 | RT-1 | CSHB-6 | - | BP-9 | P-4 |
| CGWSR****-CGDR4 | TCR4 | CCR4 | RT-1 | CSHB-6 | - | BP-9 | P-4 |
| CGWSL****-CGDL4 | TCL4 | CCL4 | RT-1 | CSHB-6 | - | BP-9 | P-4 |
| CGWSR****-CGDR5 | TCR5 | CCR5 | RT-1 | CSHB-6 | - | BP-9 | P-4 |
| CGWSL****-CGDL5 | TCL5 | CCL5 | RT-1 | CSHB-6 | - | BP-9 | P-4 |
| CGWSR****-CGDR6 | TCR6 | CCR6 | RT-1 | CSHB-6 | - | BP-9 | P-4 |
| CGWSR****-CGDL6 | TCL6 | CCL6 | RT-1 | CSHB-6 | - | BP-9 | P-4 |
| CGWSR****-8 | - | CCR/L-8 | CHHM6-20 | - | 5X14AW | BP-9 | P-5 |

## INSERT

### CGD

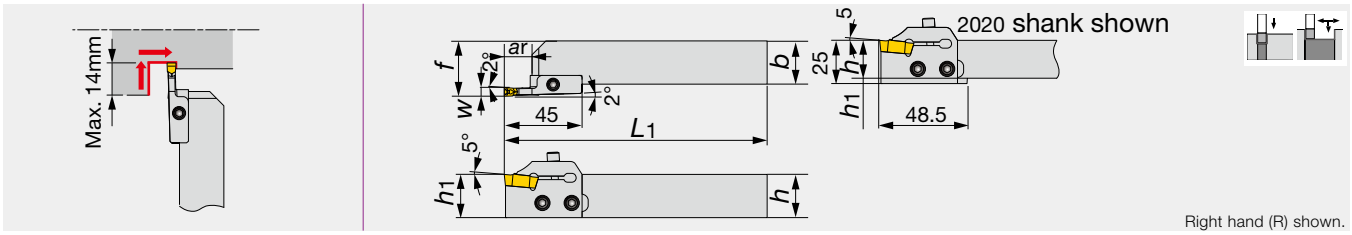



| Designation | W±0.025 | rε | Coating | Cermet | Uncoated | L | h |
|---|---|---|---|---|---|---|---|
| | | | GH330 | NS9530 | UX30 | | |
| CGD200 | 2 | 0.2 | ● | ● | ● | 20 | 3.25 |
| CGD300 | 3 | 0.2 | ● | ● | ● | 28.6 | 6.3 |
| CGD400 | 4 | 0.2 | ● | ● | ● | 28.6 | 6.3 |
| CGD500 | 5 | 0.2 | ● | ● | ● | 28.6 | 6.3 |
| CGD600 | 6 | 0.2 | ● | ● | ● | 28.6 | 8.5 |
| CGD700 | 7 | 0.2 | ● | | ● | 28.6 | 8.5 |
| CGD800 | 8 | 0.2 | ● | | ● | 28.6 | 8.5 |

● : Line-up

## STANDARD CUTTING CONDITIONS

| Operation | Cutting speed $v_c$ (m/min) | Groove width: W (mm) / Feed: f (mm/rev) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Grooving: Low carbon steels | 100 ~ 200 | 0.08 ~ 0.20 | 0.08 ~ 0.25 | 0.08 ~ 0.25 | 0.08 ~ 0.25 | 0.08 ~ 0.25 | 0.08 ~ 0.25 | 0.08 ~ 0.25 |
| Grooving: Medium carbon steels | | | | 0.08 ~ 0.30 | 0.08 ~ 0.30 | 0.08 ~ 0.30 | 0.08 ~ 0.30 | 0.08 ~ 0.30 |
| Parting off | 100 ~ 150 | 0.08 ~ 0.15 | 0.08 ~ 0.15 | 0.08 ~ 0.15 | 0.08 ~ 0.15 | 0.08 ~ 0.15 | 0.08 ~ 0.15 | 0.08 ~ 0.15 |




Right hand (R) shown.

| Designation | W | ar | h | b | L1 | h1 | f | Insert | Shank | Blade |
|---|---|---|---|---|---|---|---|---|---|---|
| CGWSR/L2020-FLR/L3GP | 3 | 10 | 20 | 20 | 152 | 20 | 27 | FLEX30R/L | CGWSR/L2020 | FLR/L3GP |
| CGWSR/L2525-FLR/L3GP | 3 | 10 | 25 | 25 | 152 | 25 | 32 | FLEX30R/L | CGWSR/L2525 | FLR/L3GP |
| CGWSR/L2020-FLR/L4GP | 4 | 12 | 20 | 20 | 152 | 20 | 27 | FLEX40R/L | CGWSR/L2020 | FLR/L4GP |
| CGWSR/L2525-FLR/L4GP | 4 | 12 | 25 | 25 | 152 | 25 | 32 | FLEX40R/L | CGWSR/L2525 | FLR/L4GP |
| CGWSR/L2020-FLR/L5GP | 5 | 14 | 20 | 20 | 152 | 20 | 27 | FLEX50R/L | CGWSR/L2020 | FLR/L5GP |
| CGWSR/L2525-FLR/L5GP | 5 | 14 | 25 | 25 | 152 | 25 | 32 | FLEX50R/L | CGWSR/L2525 | FLR/L5GP |

- When ordering, shank and blade ass'y Cat. No. or shank and blade-set are required.
- When using a right or left hand blade-set, the right hand blade-set is used with right hand shank and the left hand blade-set is used with left hand shank.

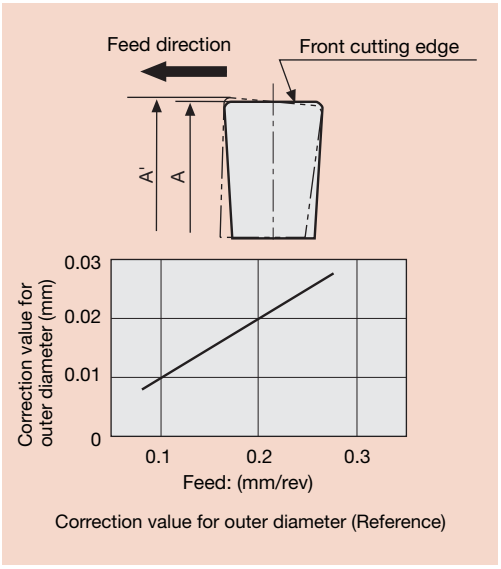
**SPARE PARTS**

| Designation | Clamping screw | Blade screw | Wrench |
|---|---|---|---|
| CGWSR/L****-FLR/L*GP | CHHM5-18 | CSHB-6 | P-4 |

## Cautionary Notes

When performing OD machining, the tool point must be set at a right angle to the axial direction of the work.

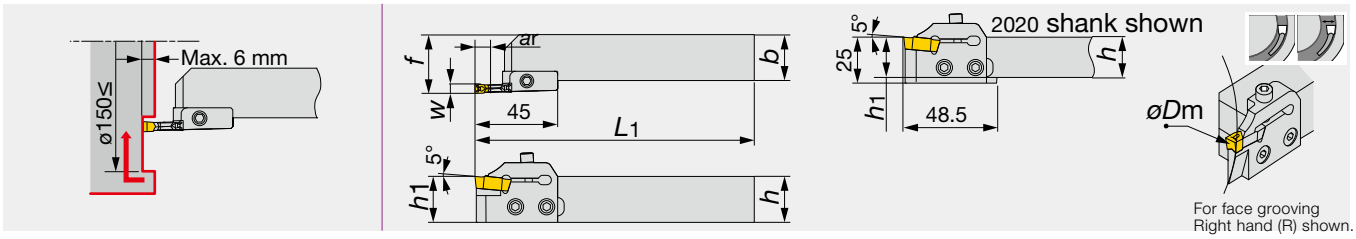
- When replacing an insert, the replacement should be made only after completely removing any chips or other foreign matter from the tool clamping area on the holder by using compressed air, etc.
- Never tighten the insert mounting screws when an insert has not been installed since doing so can deform the screws and prevent the future installation of an insert.
- Flex-Tool has mechanism in which the end cutting edge angle is formed by accepting a cutting force. In external grooving, there is a possibility that if the cutting conditions (feed and depth of cut) are set too high, the programmed diameter will not be achieved. To prevent this problem, it is necessary to perform a compensation in the program by an amount that is equal to the amount A'-A that is shown in the drawing on the right. The values of compensation corresponding to the feeds are also shown in the graph.




Correction value for outer diameter (Reference)

The length of blade for 5mm width is shortened 2mm compared from the old type blade. Please notice and read the instruction manual packaged in the box.

# MY-T SERIES
## CGWSR/L-FLR/L5TP
Toolholders for face grooving & turning



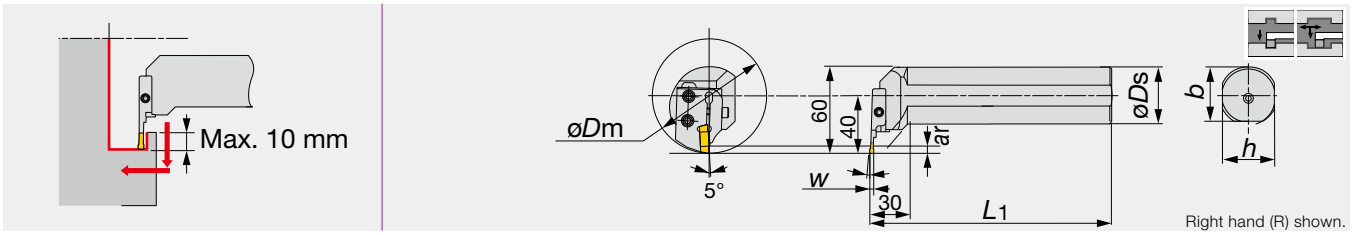

| Designation | W | øDm | ar | h | b | L1 | h1 | f | Insert | Shank | Blade |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CGWSR/L2020-FLR/L5TP | 5 | 150 | 6 | 20 | 20 | 152 | 20 | 27 | FLEX50R/L | CGWSR/L2020 | FLR/L5TP |
| CGWSR/L2525-FLR/L5TP | 5 | 150 | 6 | 25 | 25 | 152 | 25 | 32 | FLEX50R/L | CGWSR/L2525 | FLR/L5TP |

• When ordering, shank and blade ass'y Cat. No. or shank and blade set are required.
• When using a right or left hand blade set, the right hand blade set is used with right hand shank and the left hand blade set is used with left hand shank.

**SPARE PARTS**

| Designation | Clamping screw | Blade screw | Wrench |
|---|---|---|---|
| CGWSR/L****-FLR/L5TP | CHHM5-18 | CSHB-6 | P-4 |

# MY-T SERIES
## CGWTR/L0040-FLL/R3NP
Toolholders for internal grooving & turning



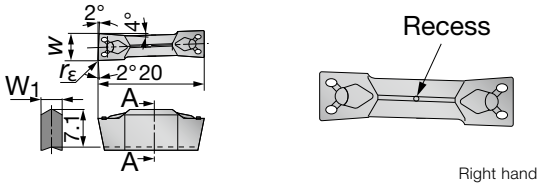

| Designation | W | øDm | ar | øDs | L1 | h | b | Insert | Shank | Blade |
|---|---|---|---|---|---|---|---|---|---|---|
| CGWTR/L0040-FLL/R3NP | 3 | 80 | 10 | 40 | 180 | 37.5 | 37 | FLEX30L/R | CGWTR/L0040 | FLL/R3NP |

• When ordering, shank and blade ass'y Cat. No. or shank and blade set are required.
• When using a right or left hand blade set, the right hand blade set is used with left hand shank and the left hand blade set is used with right hand shank.

**SPARE PARTS**

| Designation | Clamping screw | Blade screw | Wrench |
|---|---|---|---|
| CGWTR/L0040-FLL/R3NP | CHHM5-18 | CSHB-6 | P-4 |

## APPLICABLE INSERT
### FLEX(R/L)

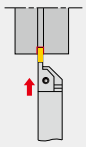



Right hand (R) shown.

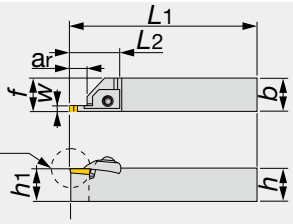
| Designation | W±0.05 | rε | Coating | Cermet | Uncoated | W1 |
|---|---|---|---|---|---|---|
| | | | T9125 | NS9530 | UX30 | |
| FLEX30R/L | 3 | 0.4 | | ● | | 2.15 |
| FLEX40R/L | 4 | 0.4 | | ● | | 3.1 |
| FLEX50R/L | 5 | 0.4 | ● | ● | ● | 4 |

● : Line-up

External toolholders for grooving & parting, with double-ended inserts



Max. parting dia.
øDmax for solid bar






Right hand (R) shown.

| Designation | W | øDmax | ar | h | b | L1 | L2 | h1 | f | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| CTWR/L2020-3 | 3 | 32 | 14 | 20 | 20 | 150 | 41 | 20 | 20.25 | CTD3 |
| CTWR/L2525-3 | 3 | 32 | 14 | 25 | 25 | 150 | 41 | 25 | 25.25 | CTD3 |
| CTWR/L2020-4 | 4 | 32 | 14 | 20 | 20 | 150 | 41 | 20 | 20.25 | CTD4 |
| CTWR/L2525-4 | 4 | 32 | 14 | 25 | 25 | 150 | 41 | 25 | 25.25 | CTD4 |
| CTWR/L2525-5 | 5 | 42 | 20 | 25 | 25 | 150 | 46 | 25 | 25.25 | CTD5 |

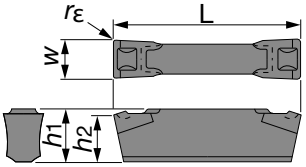


## SPARE PARTS

| Designation | Clamp | Pin | Clamping screw | Washer | Wrench |
|---|---|---|---|---|---|
| CTWR2020-3 | CTC-3R | BP-360 | CTS-M6 | CDW6 | P-4 |
| CTWL2020-3 | CTC-3L | BP-360 | CTS-M6 | CDW6 | P-4 |
| CTWR2525-3 | CTC-3R | BP-360 | CTS-M6 | CDW6 | P-4 |
| CTWL2525-3 | CTC-3L | BP-360 | CTS-M6 | CDW6 | P-4 |
| CTWR2020-4 | CTC-4R | BP-360 | CTS-M6 | CDW6 | P-4 |
| CTWL2020-4 | CTC-4L | BP-360 | CTS-M6 | CDW6 | P-4 |
| CTWR2525-4 | CTC-4R | BP-360 | CTS-M6 | CDW6 | P-4 |
| CTWL2525-4 | CTC-4L | BP-360 | CTS-M6 | CDW6 | P-4 |
| CTWR2525-5 | CTC-5R | BP-360 | CTS-M6 | CDW6 | P-4 |
| CTWL2525-5 | CTC-5L | BP-360 | CTS-M6 | CDW6 | P-4 |

## APPLICABLE INSERT

### CTD

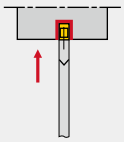


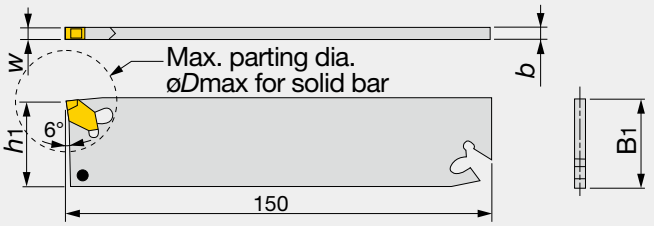

| Designation | W±0.1 | rε | AH725 | L | h1 | h2 |
|---|---|---|---|---|---|---|
| CTD3 | 3 | 0.2 | ● | 20 | 4.3 | 4 |
| CTD4 | 4 | 0.2 | ● | 20 | 5.3 | 5 |
| CTD5 | 5 | 0.2 | ● | 25 | 6.3 | 6 |

● : Line-up

## STANDARD CUTTING CONDITIONS

| Operation (Workpiece material) | | Cutting speed $v_c$ (m/min) | Feed: f (mm/rev) | | |
|---|---|---|---|---|---|
| | | | CTD3 | CTD4 | CTD5 |
| Grooving | Low carbon steels | 100 ~ 150 | 0.08 ~ 0.25 | 0.08 ~ 0.25 | 0.08 ~ 0.25 |
| | Medium carbon steels | | 0.08 ~ 0.25 | 0.08 ~ 0.3 | 0.08 ~ 0.3 |
| Parting off | | 100 ~ 150 | 0.08 ~ 0.15 | | |






| Designation | W | øDmax | b | h1 | B1 | Insert |
|---|---|---|---|---|---|---|
| CTH32-3 | 3 | 100 | 2.2 | 30.27 | 32.24 | CT*3... |
| CTH32-4 | 4 | 100 | 3.2 | 30.13 | 31.97 | CT*4... |
| CTH32-5 | 5 | 100 | 4.2 | 30 | 31.7 | CT*5... |
| CTH32-6 | 6 | 100 | 5.2 | 29.87 | 31.44 | CT*6... |

• For Applicable insert, see page C110.

**SPARE PARTS**



| Designation | Wrench |
|---|---|
| CTH... | CTL-2 |

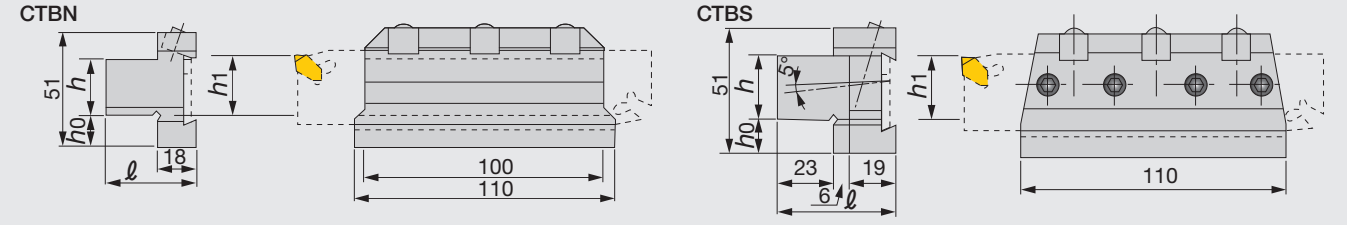
## STANDARD CUTTING CONDITIONS FOR CTH, CTS

| Operation / Workpiece material | | Cutting speed $v_c$ (m/min) | Feed: $f$ (mm/rev) | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | CTN3 | CTN4 | CTN5 | CTN6 | CTR/L□ | CT□□K |
| Grooving | Low carbon steels | 100 ~ 150 | 0.08 ~ 0.25 | 0.08 ~ 0.25 | 0.08 ~ 0.25 | 0.08 ~ 0.3 | - | - |
| | Medium carbon steels | | | 0.08 ~ 0.3 | 0.08 ~ 0.3 | | | |
| | Cast irons, Light alloys | 100 ~ 200 | - | - | - | - | | 0.1 ~ 0.3 |
| Parting off | Low carbon steels | 100 ~ 150 | 0.08 ~ 0.2 | 0.08 ~ 0.2 | 0.08 ~ 0.2 | 0.08 ~ 0.2 | 0.08 ~ 0.15 | - |
| | Medium carbon steels | | | | | | | |
| | Cast irons, Light alloys | 100 ~ 200 | - | - | - | - | - | 0.1 ~ 0.3 |

Note: When using CTS type (blade type) toolholders, reduce the values given in the table by 80 %.

## CTBN/S-32

Tool block for CTH blades



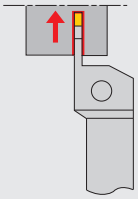

| Designation | *h* | $h_1$ | $h_0$ | *ℓ* | Blade |
|---|---|---|---|---|---|
| CTBN20-32 | 2 | 20.2 | 19.6 | 38 | CTH32... |
| CTBN25-32 | 2 | 25.2 | 14.6 | 38 | CTH32... |
| CTBN32-32 | 3 | 32.2 | 7.6 | 43 | CTH32... |
| CTBS20-32 | 2 | 20.2 | 19.4 | 48 | CTH32... |
| CTBS25-32 | 2 | 25.2 | 14.4 | 48 | CTH32... |
| CTBS32-32 | 32 | 32.2 | 7.4 | 48 | CTH32... |

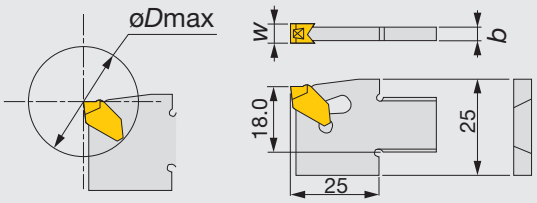
### SPARE PARTS

| Designation | Wedge clamping screw | Wedge | Wrench |
|---|---|---|---|
| CTBN**-32 | NDS-8S | CTW-2 | P-4 |
| CTBS**-32 | DS-8 | CTW-2 | P-4 |

## CTSR/L

Blades of CTS for parting






Right hand (R) shown.

| Designation | W | øDmax | b | Insert |
|---|---|---|---|---|
| CTSR/L25-3 | 3 | 50 | 2.2 | CT*3... |
| CTSR/L25-4 | 4 | 50 | 3.2 | CT*4... |
| CTSR25-5 | 5 | 50 | 4.2 | CT*5... |
| CTSR25-6 | 6 | 50 | 5.2 | CT*6... |

- Refer to the assembly drawing of "CTBR/L" regarding the dimensions.
- For Applicable insert, see page C110.

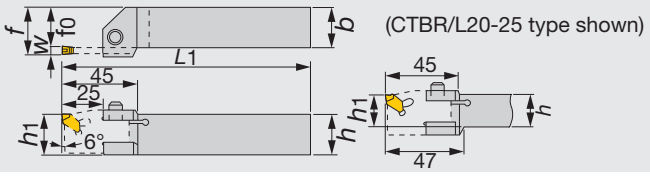
### SPARE PARTS



| Designation | Wrench |
|---|---|
| CTSR/L... | CTL-2 |

# TOOLHOLDER

## CTBR/L




(CTBR/L20-25 type shown)

Right hand (R) shown.

| W | Designation | Blade | ar | h1 | h | b | L1 | f0 | f |
|---|---|---|---|---|---|---|---|---|---|
| 3,4 | CTBR/L20-25 | CTSR/L25-3/4 | Max.25Max.cut off dia.ø50 | 20.2 | 20 | 25 | 150 | 19.6 | 22.6/23.6 |
| 3,4,5,6 | CTBR/L25-25 | CTSR/L25-3/4/5/6 | Max.25Max.cut off dia.ø50 | 25.2 | 25 | 25 | 150 | 24.6 | 27.6/28.6/29.6/30.6 |

When using a right or left hand blade set, the right hand blade set is used with right hand shank and the left hand blade set is used with left hand shank.

### SPARE PARTS



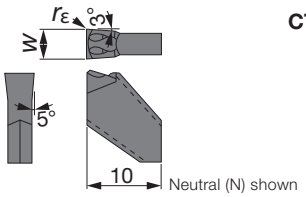


| Designation | Clamping Screw | Wrench |
|---|---|---|
| CTBR/L... | M6×20 | P-5 |

# INSERT for CTH, CTS TYPE PARTING OFF TOOLHOLDER

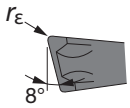
## CTN/CTR/CTL

**CTN**



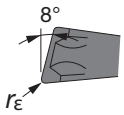

Neutral (N) shown

**CTR**




Right hand (R)

**CTL**



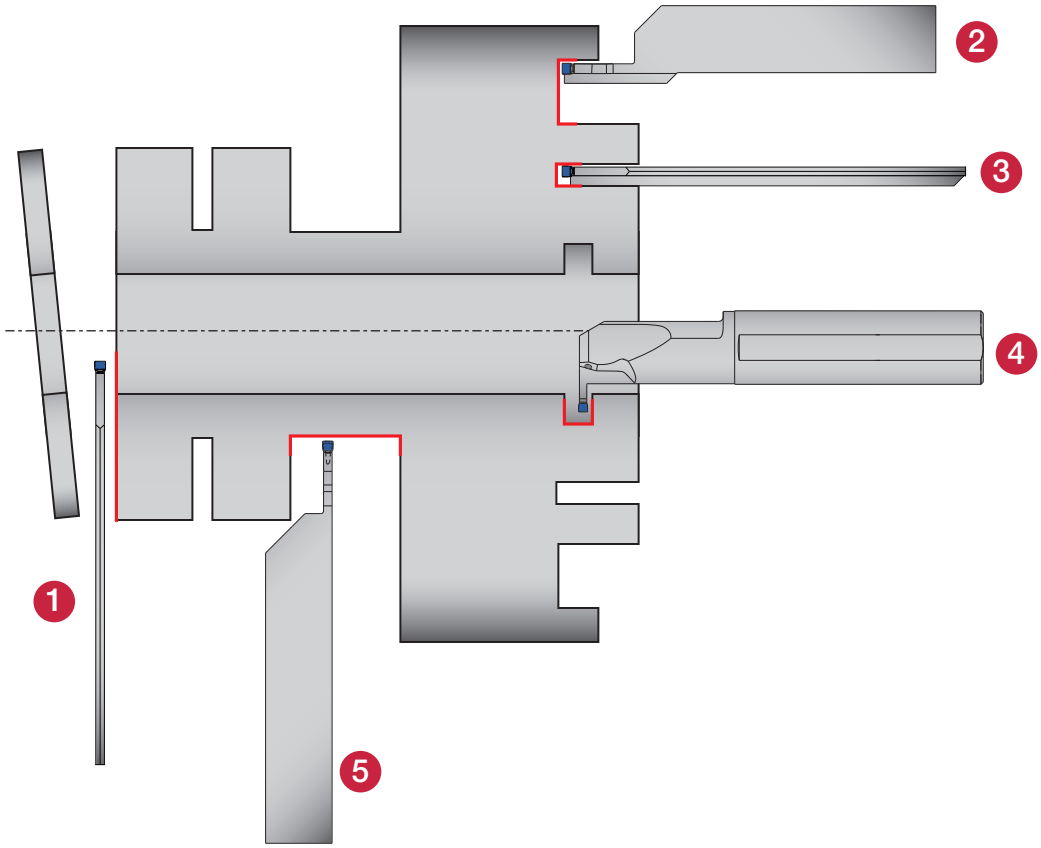

Left hand (L)

| Designation | W±0.2 | rε | Coating T313W | | | Uncoated TH10 | | |
|---|---|---|---|---|---|---|---|---|
| | | | N | R | L | N | R | L |
| CTN3 | 3 | 0.2 | ● | | | | | |
| CTR/L3 | 3 | 0.2 | | ● | ● | | | |
| CTN3K | 3 | 0.2 | | | | ● | | |
| CTR/L3K | 3 | 0.2 | | | | | ● | ● |
| CTN4 | 4 | 0.2 | ● | | | | | |
| CTR/L4 | 4 | 0.2 | | ● | ● | | | |
| CTN4K | 4 | 0.2 | | | | ● | | |
| CTR/L4K | 4 | 0.2 | | | | | ● | ● |
| CTN5 | 5 | 0.3 | ● | | | | | |
| CTR/L5 | 5 | 0.3 | | ● | | | | |
| CTN5K | 5 | 0.3 | | | | ● | | |
| CTR/L5K | 5 | 0.3 | | | | | ● | |
| CTN6 | 6 | 0.3 | ● | | | | | |
| CTN6K | 6 | 0.3 | | | | ● | | |

● : Line-up

# The insert's secure & unique clamping guarantees reliable machining in grooving and turning






### 1 EGP
Blade type
*W* = 4 - 6 mm
Max. parting Dia.:
120 mm
Shank size:
20 - 32 mm
C113

### EGP-CHP
Blade type
*W* = 4 - 6 mm
Max. parting Dia.:
120 mm
Shank size:
20 - 32 mm
C114

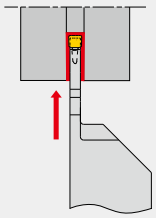
### 2 ETFR/L
*W* = 4 - 6 mm
*ar* = 15 - 32 mm
Shank size:
20 - 25 mm
C116

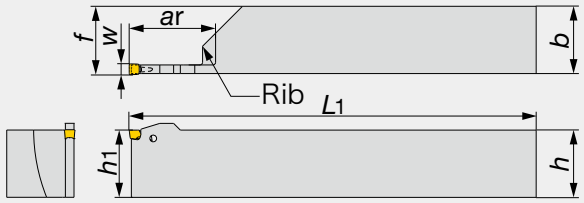
### ETFR-CHP
*W* = 4 mm
*ar* = 15 - 32 mm
Shank size:
25 mm
C117

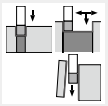
### 3 EFPR/L
Blade type
*W* = 4 - 6 mm
*ar* = Max. 65 mm
Shank size:
25 mm
C118

### 4 ETIR/L
*W* = 4 - 6 mm
*ar* = 6 - 11 mm
Shank size:
ø16 - ø32 mm
C115

### 5 ETER/L
*W* = 4 - 6 mm
*ar* = 25 - 35 mm
Shank size:
20 - 32 mm
C112





Right hand (R) shown.

| Designation | W | ar | h1 | b | h | L1 | f | Insert | Rib |
|---|---|---|---|---|---|---|---|---|---|
| ETER/L2020-4T25 | 4 | 25 | 20 | 20 | 20 | 125 | 20.4 | E**4... | Without |
| ETER/L2525-4T25 | 4 | 25 | 25 | 25 | 25 | 150 | 25.4 | E**4... | Without |
| ETER/L3232-4T30 | 4 | 30 | 32 | 32 | 32 | 170 | 32.4 | E**4... | Without |
| ETER/L2020-5T25 | 5 | 25 | 20 | 20 | 20 | 125 | 20.4 | ETX5... | Without |
| ETER/L2525-5T32 | 5 | 32 | 25 | 25 | 25 | 150 | 25.4 | ETX5... | Without |
| ETER/L3232-5T32 | 5 | 32 | 32 | 32 | 32 | 170 | 32.4 | ETX5... | Without |
| ETER/L2525-6T35 | 6 | 35* | 25 | 25 | 25 | 150 | 25.4 | ETX6... | With |
| ETER/L3232-6T35 | 6 | 35** | 32 | 32 | 32 | 170 | 32.4 | ETX6... | With |

* Max. ø170
**Max. ø340

• For Applicable insert, see page C120 - C121.



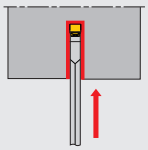
## SPARE PARTS

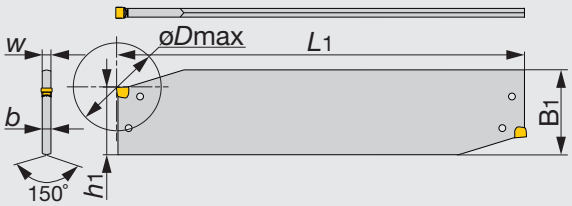
| Designation | Wrench* |
|---|---|
| ETER/L2020-4T25 | ECW-456EF |
| ETER/L2525-4T25 | ECW-456EF |
| ETER/L3232-4T30 | ECW-456EF |
| ETER/L2020-5T25 | ECW-456EF |
| ETER/L2525-5T32 | ECW-456EF |
| ETER/L3232-5T32 | ECW-456EF |
| ETER/L2525-6T35 | ECW-456EF |
| ETER/L3232-6T35 | ECW-456EF |

*Optional parts

## EGP

Blades for external deep grooving & parting






| Designation | W | øDmax | h1 | b | B1 | L1 | Insert |
|---|---|---|---|---|---|---|---|
| EGP26-4D | 4 | 80 | 21.4 | 3.2 | 26 | 150 | E**4... |
| EGP32-4D | 4 | 100 | 24.9 | 3.2 | 32 | 150 | E**4... |
| EGP32-5D | 5 | 120 | 24.9 | 4.0 | 32 | 150 | ETX5... |
| EGP32-6D | 6 | 120 | 24.9 | 5.2 | 32 | 150 | ETX6... |

- øDmax: Max. parting off diameter
- For Applicable insert, see page C120 - C121.

### SPARE PARTS



| Designation | Wrench* |
|---|---|
| EGP26-4D | ECW-456EF |
| EGP32-*D | ECW-456EF |

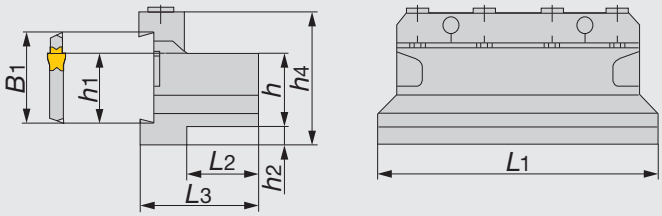
*Optional parts



EASYMCUT ULTI

## CTBU

Tool block for CGP and EGP blades




| Designation | h1 | B1 | L1 | h | h2 | h4 | L2 | L3 | Blade |
|---|---|---|---|---|---|---|---|---|---|
| CTBU20-26 | 21.4 | 26 | 86 | 20 | 9 | 43 | 21 | 38 | EGP26... |
| CTBU25-26 | 21.4 | 26 | 110 | 25 | 5 | 45 | 23 | 42 | EGP26... |
| CTBU20-32 | 24.8 | 32 | 100 | 20 | 13 | 50 | 19 | 38 | EGP32... |
| CTBU25-32 | 24.8 | 32 | 110 | 25 | 8 | 50 | 23 | 42 | EGP32... |
| CTBU32-32 | 24.8 | 32 | 110 | 32 | 5 | 54 | 29 | 48 | EGP32... |

### SPARE PARTS

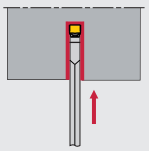


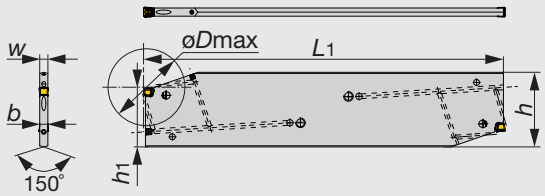


| Designation | Clamp | Clamping screw | Wrench |
|---|---|---|---|
| CTBU20-26 | CT-86 | CM6X30-S | P-5 |
| CTBU25-26 | CT-105 | CM6X30-S | P-5 |
| CTBU20-32 | CT-100 | CM6X30-S | P-5 |
| CTBU25, 32-32 | CT-110 | CM6X30-S | P-5 |

## EGP-CHP

Blades for external deep grooving & parting, with channels for high pressure coolant.






| Designation | W | øDmax | ar | h1 | b | L1 | h1 | Insert |
|---|---|---|---|---|---|---|---|---|
| EGP32-4D-CHP | 4 | 100 | 50 | 32 | 3.4 | 150 | 24.9 | E**4... |
| EGP32-5D-CHP | 5 | 120 | 60 | 32 | 4.2 | 160 | 24.9 | ETX5... |
| EGP32-6D-CHP | 6 | 120 | 60 | 32 | 5.2 | 160 | 24.9 | ETX6... |

- øDmax: Max. parting off diameter
- For Applicable insert, see page C120 - C121.

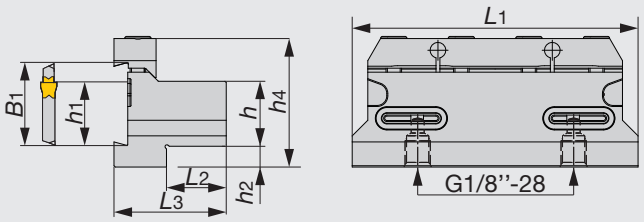
### SPARE PARTS

| Designation | Sealing screw | Wrench* |
|---|---|---|
| EGP32-*D-CHP | SGC340 | ECW-456EF |

*Optional parts

## CTBU-CHP

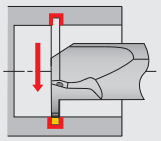
Tool blocks for external deep parting and grooving blades with channels for high pressure coolant

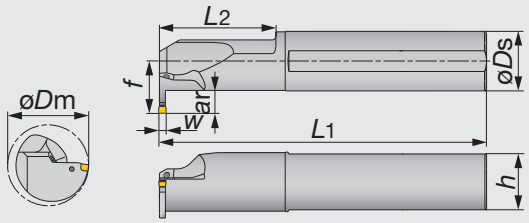



| Designation | h | B1 | L2 | L1 | h1 | h2 | h4 | L3 | Blade |
|---|---|---|---|---|---|---|---|---|---|
| CTBU25-32-CHP | 25 | 32 | 23 | 110 | 24.8 | 8 | 49.4 | 43.2 | EGP32-*D-CHP |

### SPARE PARTS

| Designation | Sealing screw | Clamp | Wrench | O-ring |
|---|---|---|---|---|
| CTBU25-32-CHP | SRM6X16DIN912-12.9 | CT-110 | P-5 | OR14X2.5NN |






Right hand (R) shown.

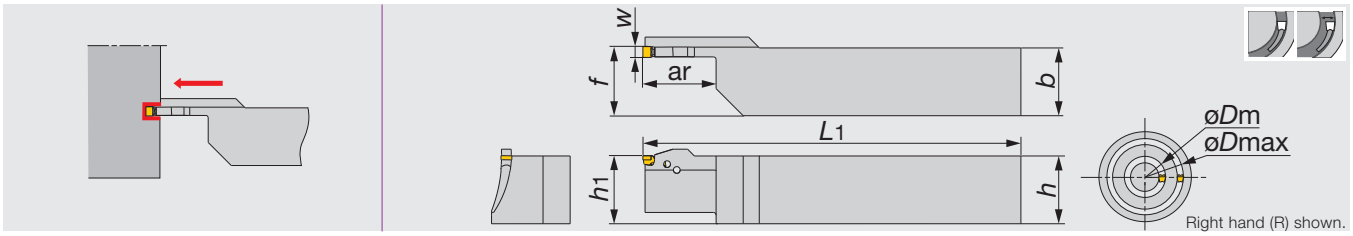
| Designation | W | øDm | ar | øDs | h | L1 | f | L2 | Insert |
|---|---|---|---|---|---|---|---|---|---|
| ETIR/L16-4T06-D200 | 4 | 20 | 6 | 16 | 15 | 160 | 15 | 40 | E**4... |
| ETIR/L20-4T06-D250 | 4 | 25 | 6 | 20 | 18 | 160 | 17 | 40 | E**4... |
| ETIR/L25-4T09-D320 | 4 | 32 | 9 | 25 | 23 | 200 | 22.5 | 40 | E**4... |
| ETIR/L32-4T11-D400 | 4 | 40 | 11 | 32 | 30 | 250 | 28 | 60 | E**4... |
| ETIR/L32-5T11-D400 | 5 | 40 | 11 | 32 | 30 | 250 | 28 | 60 | ETX5... |
| ETIR/L32-6T11-D400 | 6 | 40 | 11 | 32 | 30 | 250 | 28 | 60 | ETX6... |

- Wrench should be ordered separately.
- For Applicable insert, see page C120 - C121.

## SPARE PARTS

| Designation | Seal cap (internal screw) | Wrench* |
|---|---|---|
| ETIR/L16-4T06-D200 | CA-16(M6) | ECW-456I |
| ETIR/L20-4T06-D250 | CA-20(M6) | ECW-456I |
| ETIR/L25-4T09-D320 | CA-25(R1/8") | ECW-456EF |
| ETIR/L32... | CA-32(R1/8") | ECW-456EF |

*Optional parts




| Designation | W | øDm | øDmax | ar | h | b | L1 | h1 | f | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| ETFR/L2020-4T15-030035 | 4 | 30 | 35 | 15 | 20 | 20 | 125 | 20 | 20.5 | E**4... |
| ETFR/L2525-4T15-030035 | 4 | 30 | 35 | 15 | 25 | 25 | 150 | 25 | 25.5 | E**4... |
| ETFR/L2020-4T22-035045 | 4 | 35 | 45 | 22 | 20 | 20 | 125 | 20 | 20.5 | E**4... |
| ETFR/L2525-4T22-035045 | 4 | 35 | 45 | 22 | 25 | 25 | 150 | 25 | 25.5 | E**4... |
| ETFR/L2020-4T25-045055 | 4 | 45 | 55 | 25 | 20 | 20 | 125 | 20 | 20.5 | E**4... |
| ETFR/L2525-4T25-045055 | 4 | 45 | 55 | 25 | 25 | 25 | 150 | 25 | 25.5 | E**4... |
| ETFR/L2020-4T25-055075 | 4 | 55 | 75 | 25 | 20 | 20 | 125 | 20 | 20.5 | E**4... |
| ETFR/L2525-4T25-055075 | 4 | 55 | 75 | 25 | 25 | 25 | 150 | 25 | 25.5 | E**4... |
| ETFR/L2020-4T25-075120 | 4 | 75 | 120 | 25 | 20 | 20 | 125 | 20 | 20.5 | E**4... |
| ETFR/L2525-4T25-075120 | 4 | 75 | 120 | 25 | 25 | 25 | 150 | 25 | 25.5 | E**4... |
| ETFR/L2525-4T25-120200 | 4 | 120 | 200 | 25 | 25 | 25 | 150 | 25 | 25.5 | E**4... |
| ETFR/L2525-4T25-200500 | 4 | 200 | 500 | 25 | 25 | 25 | 150 | 25 | 25.5 | E**4... |
| ETFR/L2525-5T25-035045 | 5 | 35 | 45 | 25 | 25 | 25 | 150 | 25 | 25.5 | ETX5... |
| ETFR/L2525-5T25-045055 | 5 | 45 | 55 | 25 | 25 | 25 | 150 | 25 | 25.5 | ETX5... |
| ETFR/L2525-5T25-055075 | 5 | 55 | 75 | 25 | 25 | 25 | 150 | 25 | 25.5 | ETX5... |
| ETFR/L2525-5T32-075120 | 5 | 75 | 120 | 32 | 25 | 25 | 150 | 25 | 25.5 | ETX5... |
| ETFR/L2525-5T32-120200 | 5 | 120 | 200 | 32 | 25 | 25 | 150 | 25 | 25.5 | ETX5... |
| ETFR/L2525-5T32-200500 | 5 | 200 | 500 | 32 | 25 | 25 | 150 | 25 | 25.5 | ETX5... |
| ETFR/L2525-6T25-040055 | 6 | 40 | 55 | 25 | 25 | 25 | 150 | 25 | 25.5 | ETX6... |
| ETFR/L2525-6T25-055075 | 6 | 55 | 75 | 25 | 25 | 25 | 150 | 25 | 25.5 | ETX6... |
| ETFR/L2525-6T32-075120 | 6 | 75 | 120 | 32 | 25 | 25 | 150 | 25 | 25.5 | ETX6... |
| ETFR/L2525-6T32-120200 | 6 | 120 | 200 | 32 | 25 | 25 | 150 | 25 | 25.5 | ETX6... |
| ETFR/L2525-6T32-200500 | 6 | 200 | 500 | 32 | 25 | 25 | 150 | 25 | 25.5 | ETX6... |

• For Applicable insert, see page C120 - C121.

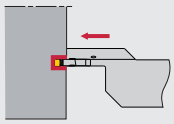
## SPARE PARTS

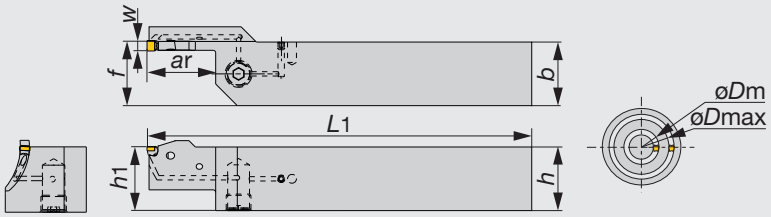
| Designation | Wrench* |
|---|---|
| ETFR/L... | ECW-456EF |

*Optional parts

# ETFR-CHP

Toolholders for face grooving & turning, with channels for high pressure coolant.






Right hand (R) shown.

| Designation | W | øDm | øDmax | ar | h | b | L1 | h1 | f | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| ETFR2525-4T15-030035-CHP | 4 | 30 | 35 | 15 | 25 | 25 | 150 | 25 | 25.5 | E**4... |
| ETFR2525-4T22-035045-CHP | 4 | 35 | 45 | 22 | 25 | 25 | 150 | 25 | 25.5 | E**4... |
| ETFR2525-4T25-045055-CHP | 4 | 45 | 55 | 25 | 25 | 25 | 150 | 25 | 25.5 | E**4... |
| ETFR2525-4T25-055075-CHP | 4 | 55 | 75 | 25 | 25 | 25 | 150 | 25 | 25.5 | E**4... |
| ETFR2525-4T25-075120-CHP | 4 | 75 | 120 | 25 | 25 | 25 | 150 | 25 | 25.5 | E**4... |
| ETFR2525-4T25-120200-CHP | 4 | 120 | 200 | 25 | 25 | 25 | 150 | 25 | 25.5 | E**4... |
| ETFR2525-4T25-200500-CHP | 4 | 200 | 500 | 25 | 25 | 25 | 150 | 25 | 25.5 | E**4... |

• For Applicable insert, see page C120 - C121.

## SPARE PARTS

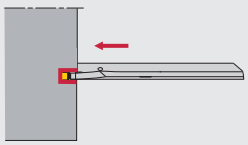


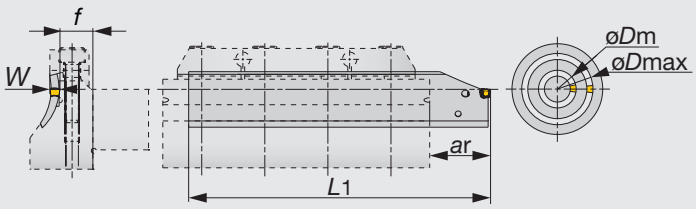
| Designation | Wrench* |
|---|---|
| ETFR****-CHP | ECW-456EF |

*Optional parts

# EFPR/L

## Face grooving blade








Right hand (R) shown

| Designation | W | øDm | øDmax | f | L1 | min ar | max ar | Insert |
|---|---|---|---|---|---|---|---|---|
| EFPR/L-4-030035 | 4 | 30 | 35 | 13.6 | 125 | 18 | 50 | E**4... |
| EFPR-4-035045 | 4 | 35 | 45 | 13.6 | 125 | 18 | 50 | E**4... |
| EFPR-4-045055 | 4 | 45 | 55 | 13.6 | 125 | 18 | 50 | E**4... |
| EFPR-4-055075 | 4 | 55 | 75 | 13.6 | 125 | 18 | 50 | E**4... |
| EFPR-4-075120 | 4 | 75 | 120 | 13.6 | 140 | 18 | 65 | E**4... |
| EFPR-4-120200 | 4 | 120 | 200 | 13.6 | 140 | 18 | 65 | E**4... |
| EFPR-4-200500 | 4 | 200 | 500 | 13.6 | 140 | 18 | 65 | E**4... |
| EFPR-5-035045 | 5 | 35 | 45 | 13.6 | 125 | 19 | 50 | ETX5... |
| EFPR-5-045055 | 5 | 45 | 55 | 13.6 | 125 | 19 | 50 | ETX5... |
| EFPR-5-055075 | 5 | 55 | 75 | 13.6 | 125 | 19 | 50 | ETX5... |
| EFPR-5-075120 | 5 | 75 | 120 | 13.6 | 140 | 19 | 65 | ETX5... |
| EFPR-5-120200 | 5 | 120 | 200 | 13.6 | 140 | 19 | 65 | ETX5... |
| EFPR-5-200500 | 5 | 200 | 500 | 13.6 | 140 | 19 | 65 | ETX5... |
| EFPR-6-045055 | 6 | 45 | 55 | 13.6 | 125 | 20 | 50 | ETX6... |
| EFPR-6-055075 | 6 | 55 | 75 | 13.6 | 125 | 20 | 50 | ETX6... |
| EFPR-6-075120 | 6 | 75. | 120 | 13.6 | 140 | 20 | 65 | ETX6... |
| EFPR-6-120200 | 6 | 120 | 200 | 13.6 | 140 | 20 | 65 | ETX6... |
| EFPR/L-6-200500 | 6 | 200 | 500 | 13.6 | 140 | 20 | 65 | ETX6... |

• For Applicable insert, see page C120 - C121.

### SPARE PARTS

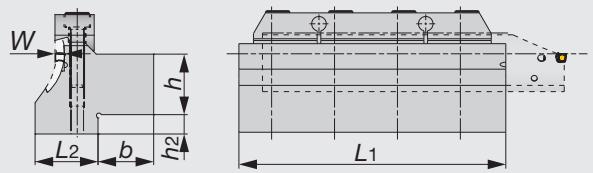


| Designation | Wrench* |
|---|---|
| EFPR/L... | ECW-456I |

*Optional parts

# CTBU-CHP for EFPR/L

Tool block for EFP blades, with channels for high pressure coolant.




| Designation | W | øDm | h | b | h2 | L2 | L1 | Blade |
|---|---|---|---|---|---|---|---|---|
| CTBU25-030-4-CHP | 4 | 30 | 25 | 23 | 7.6 | 26 | 110 | EFPR/L-4-030035 |
| CTBU25-035-4/5-CHP | 4, 5 | 35 | 25 | 23 | 7.6 | 26 | 110 | EFPR-4/5-035045 |
| CTBU25-045-4/5-CHP | 4, 5 | 45 | 25 | 23 | 7.6 | 26 | 110 | EFPR-4/5-045055 |
| CTBU25-055-4/5-CHP | 4, 5 | 55 | 25 | 23 | 7.6 | 24 | 110 | EFPR-4/5-055075 |
| CTBU25-075-4/5-CHP | 4, 5 | 75 | 25 | 23 | 7.6 | 22 | 110 | EFPR-4/5-075120 |
| CTBU25-120-4/5-CHP | 4, 5 | 120 | 25 | 23 | 7.6 | 21 | 110 | EFPR-4/5-120200 |
| CTBU25-200-4/5-CHP | 4, 5 | 200 | 25 | 23 | 7.6 | 18.5 | 110 | EFPR-4/5-200500 |
| CTBU25-045-6-CHP | 6 | 45 | 25 | 23 | 7.6 | 28 | 110 | EFPR-6-045055 |
| CTBU25-055-6-CHP | 6 | 55 | 25 | 23 | 7.6 | 26 | 110 | EFPR-6-055075 |
| CTBU25-075-6-CHP | 6 | 75 | 25 | 23 | 7.6 | 24 | 110 | EFPR-6-075120 |
| CTBU25-120-6-CHP | 6 | 120 | 25 | 23 | 7.6 | 23 | 110 | EFPR-6-120200 |
| CTBU25-200-6-CHP | 6 | 200 | 25 | 23 | 7.6 | 20.5 | 110 | EFPR/L-6-200500 |

## SPARE PARTS

| Designation | Clamp | Clamping screw | Wrench |
|---|---|---|---|
| CTBU25-***-*-CHP | CT-110 | CM6X30-S | P-5 |

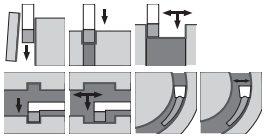
## ETX type



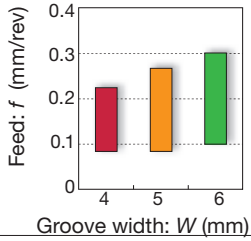
C121

**Multi-functional insert**
**Well-balanced sharpness and strength**

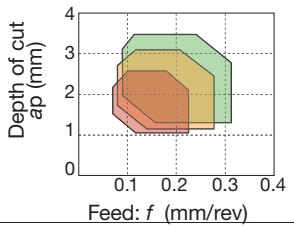
*W* = 4 - 6 mm



■ Standard feed for grooving




■ Standard feed and depth of cut for turning



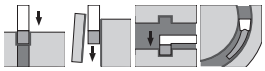

## EGM type



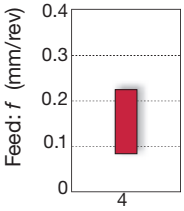
C121

**First choice for parting off**
**Well-designed edge with high strength**

*W* = 4 mm



■ Standard feed for grooving

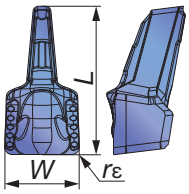





## INSERT

### ETX



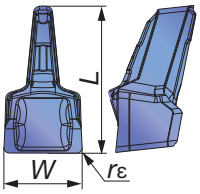



| Designation | W±0.05 | rε | AH725 | L |
|---|---|---|---|---|
| ETX4-040 | 4 | 0.4 | ● | 8 |
| ETX5-040 | 5 | 0.4 | ● | 10 |
| ETX6-040 | 6 | 0.4 | ● | 12 |

● : Line-up

### EGM





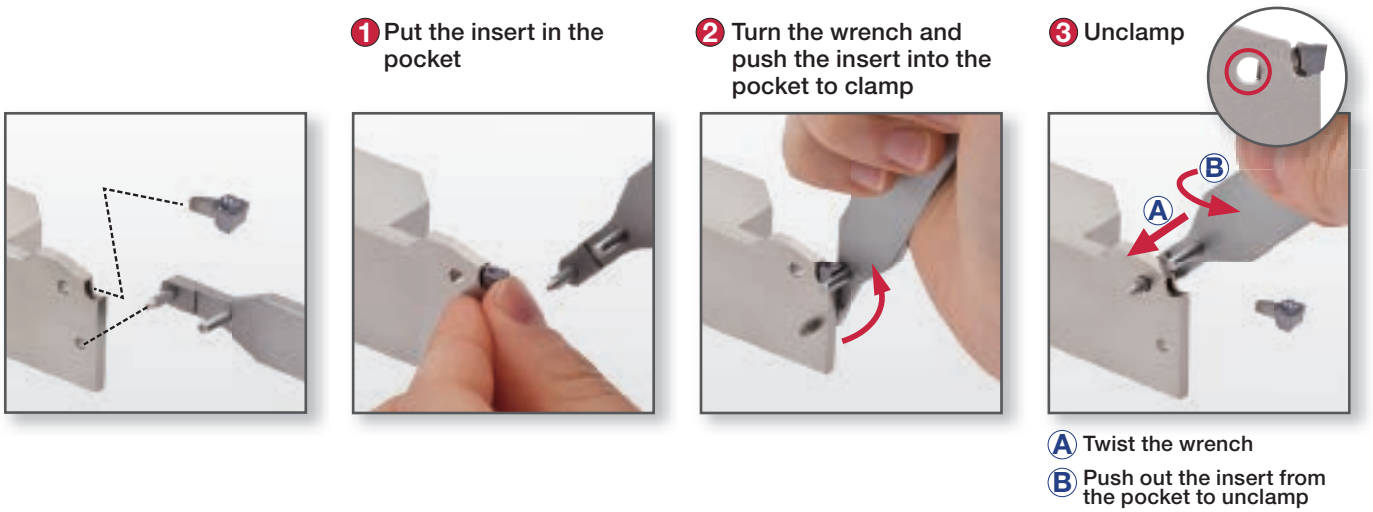

| Designation | W±0.05 | rε | AH725 | L |
|---|---|---|---|---|
| EGM4-030 | 4 | 0.3 | ● | 8 |

● : Line-up

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Hardness | Grades | Chip-breaker | Cutting speed Vc (m/min) |
|---|---|---|---|---|---|
| P | Low carbon steel (C15, C20, etc.) | - 300 HB | AH725 | ETX | 80 - 180 |
| | | - 300 HB | AH725 | EGM | 80 - 180 |
| | Carbon steel, Alloy steel (C55, 42CrMoS4, etc.) | - 300 HB | AH725 | ETX | 80 - 180 |
| | | - 300 HB | AH725 | EGM | 80 - 180 |
| | Prehardened steel (NAK80, PX5, etc.) | - 300 HB | AH725 | ETX | 80 - 180 |
| | | - 300 HB | AH725 | EGM | 80 - 180 |
| M | Stainless steel (X5CrNi18-9, X5CrNiMo17-12-2, etc) | - | AH725 | ETX | 50 - 120 |
| | | - | AH725 | EGM | 50 - 120 |

## PROCEDURE TO CLAMP AND UNCLAMP INSERT




A Twist the wrench

B Push out the insert from the pocket to unclamp

## PARTS FOR COOLANT HOSE

### Connecting hose

Fig. 1

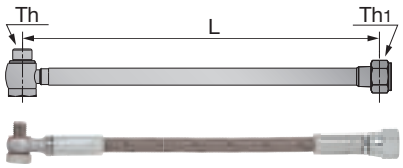
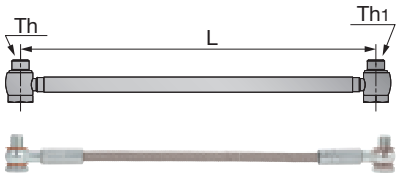
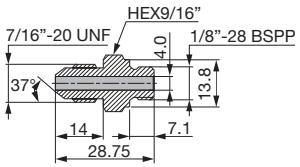



Fig. 2




| Designation | Length | Threading size | | Max. pressure | Fig. |
|---|---|---|---|---|---|
| | L | Th | Th1 | (MPa) | |
| CHP-HOSE-G1/8-7/16-200BS | 200 | G1/8"-28 BSPP | 7/16"-20 UNF | 26 | 1 |
| CHP-HOSE-G1/8-7/16-250BS | 250 | G1/8"-28 BSPP | 7/16"-20 UNF | 26 | 1 |
| CHP-HOSE-5/16-7/16-200BS | 200 | 5/16"-24UNF | 7/16"-20 UNF | 20 | 1 |
| CHP-HOSE-5/16-G1/8-200BS | 200 | 5/16"-24UNF | G1/8"-28 BSPP | 20 | 1 |
| CHP-HOSE-G1/8-G1/8-200BB | 200 | G1/8"-28 BSPP | G1/8"-28 BSPP | 26 | 2 |
| CHP-HOSE-G1/8-G1/8-250BB | 250 | G1/8"-28 BSPP | G1/8"-28 BSPP | 26 | 2 |

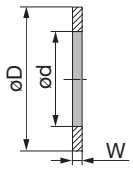
### Connector






| Designation |
|---|
| CHP-NIPPLE-G1/8-7/16UNF |

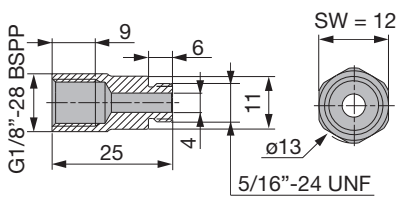
### Seal washer






| Designation | øD | ød | W |
|---|---|---|---|
| CHP-COPPER-SEAL1/8 | 15 | 10 | 1 |
| CHP-COPPER-SEAL5/16 | 11 | 8 | 1 |
| CHP-COPPER-SEAL5/16-2.5 | 11 | 8 | 2.5 |

### Connector for small lathe with seal washer

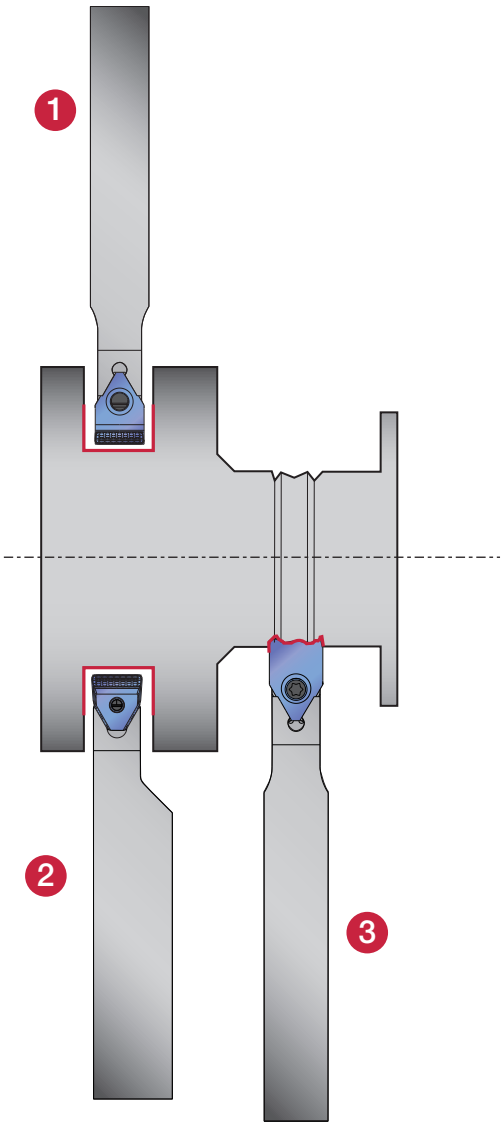





| Designation |
|---|
| CHP-CONECTOR/5/16-G1/8 |

# Efficiently **reduces machining time** of wide width grooving and forming!

Effectively reduces the number of passes or machining time of complex profiles!




## 1 FPGN

Lever lock type
W = 10 - 25 mm
ar = 20 - 36 mm
Shank size:
12 - 25 mm

C125

## 2 FPGR

Lever lock type
W = 10 - 25 mm
ar = 20 - 50 mm
Shank size:
25 - 40 mm

C124

## 3 SPGN

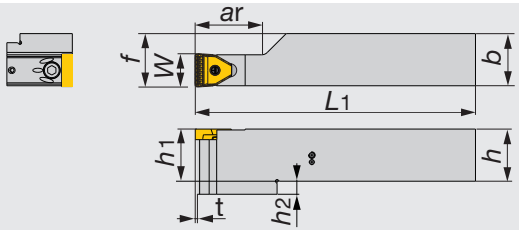
Screw clamp type
W = 10 - 25 mm
ar = 20 - 36 mm
Shank size:
12 - 25 mm

C125

# FPGR/L

## Lever lock type for external wide grooving and profiling






| Designation | W | ar PSGB | ar PSGM | h1 | b | h | L1 PSGB | L1 PSGM | f | h2 | t PSGB | t PSGM | Insert(1) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FPGR2525M-10T20 | 10 | 25 | 20 | 25 | 25 | 25 | 155 | 150 | 25.5 | - | 5.5 | 0.5 | PSG*10... |
| FPGR3232P-10T36 | 10 | 41 | 36 | 32 | 32 | 32 | 175 | 170 | 32.5 | - | 5.5 | 0.5 | PSG*10... |
| FPGR2525M-15T20 | 15 | 25 | 20 | 25 | 25 | 25 | 155 | 150 | 25.5 | - | 5.5 | 0.5 | PSG*15... |
| FPGR3232P-15T40 | 15 | 45 | 40 | 32 | 32 | 32 | 175 | 170 | 32.5 | - | 5.5 | 0.4 | PSG*15... |
| FPGR3232P-20T40 | 20 | 45 | 40 | 32 | 32 | 32 | 175 | 170 | 32.5 | 8 | 5.5 | 0.4 | PSG*20... |
| FPGR4040R-20T50 | 20 | 55 | 50 | 40 | 40 | 40 | 205 | 200 | 40.5 | 8 | 5.5 | 0.4 | PSG*20... |
| FPGR3232P-25T40 | 25 | 45 | 40 | 32 | 32 | 32 | 175 | 170 | 32.5 | 8 | 5.5 | 0.4 | PSG*25... |
| FPGR4040R-25T50 | 25 | 55 | 50 | 40 | 40 | 40 | 205 | 200 | 40.5 | 8 | 5.5 | 0.4 | PSG*25... |

(1) Can be used with both wide grooving and profile grooving inserts

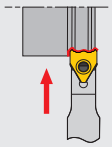
### SPARE PARTS

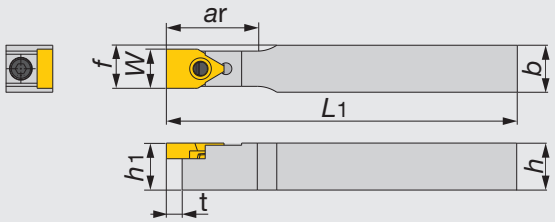


| Designation | Lever | Clamping screw | Spring | Wrench |
|---|---|---|---|---|
| FPGR*****-10T..., 15T... | FCL4 | FCS3 | BP-5 | P-2.5 |
| FPGR*****-20T..., 25T... | FCL8 | FCS6 | BP-9 | P-5 |

## FPGN

Lever lock type for external wide grooving and profiling






| Designation | W | ar PSGB | ar PSGM | h1 | b | h | L1 PSGB | L1 PSGM | f | t PSGB | t PSGM | Insert(1) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FPGN1212X-10T20 | 10 | 25 | 20 | 12 | 12 | 12 | 125 | 120 | 11 | 5.5 | 0.5 | PSG*10... |
| FPGN1616X-10T20 | 10 | 25 | 20 | 16 | 16 | 16 | 125 | 120 | 13 | 5.5 | 0.5 | PSG*10... |
| FPGN2020K-10T20 | 10 | 25 | 20 | 20 | 20 | 20 | 130 | 125 | 15 | 5.5 | 0.5 | PSG*10... |
| FPGN1616X-15T25 | 15 | 30 | 25 | 16 | 16 | 16 | 125 | 120 | 15.5 | 5.5 | 0.4 | PSG*15... |
| FPGN2020K-15T25 | 15 | 30 | 25 | 20 | 20 | 20 | 130 | 125 | 17.5 | 5.5 | 0.4 | PSG*15... |
| FPGN2020K-20T32 | 20 | 37 | 32 | 20 | 20 | 20 | 130 | 125 | 20 | 5.5 | 0.4 | PSG*20... |
| FPGN2525M-20T32 | 20 | 37 | 32 | 25 | 25 | 25 | 155 | 150 | 22.5 | 5.5 | 0.4 | PSG*20... |
| FPGN2525M-25T36 | 25 | 41 | 36 | 25 | 25 | 25 | 155 | 150 | 25 | 5.5 | 0.4 | PSG*25... |

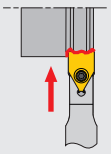
• We can make special shape with forming insert (PSGB type) responding to customer's request.(1) Can be used with both wide grooving and profile grooving inserts

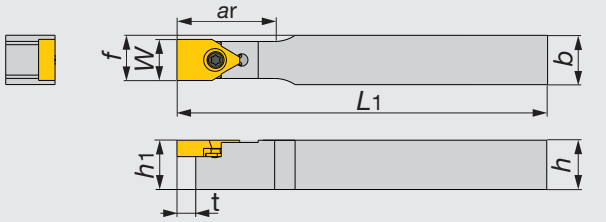
### SPARE PARTS

| Designation | Lever | Clamping screw | Spring | Wrench |
|---|---|---|---|---|
| FPGN*****-10T..., 15T... | FCL4 | FCS3 | BP-5 | P-2.5 |
| FPGN*****-20T..., 25T... | FCL8 | FCS6 | BP-9 | P-5 |

## SPGN

Screw-on type, for external wide grooving and profiling






| Designation | W | ar | h1 | b | h | L1 | f | t | Insert(1) |
|---|---|---|---|---|---|---|---|---|---|
| SPGN1212X-10T20 | 10 | 25 | 12 | 12 | 12 | 125 | 11 | 5.5 | PSGB10 |
| SPGN1616X-10T20 | 10 | 25 | 16 | 16 | 16 | 125 | 13 | 5.5 | PSGB10 |
| SPGN2020K-10T20 | 10 | 25 | 20 | 20 | 20 | 130 | 15 | 5.5 | PSGB10 |
| SPGN1616X-15T25 | 15 | 30 | 16 | 16 | 16 | 125 | 15.5 | 5.5 | PSGB15 |
| SPGN2020K-15T25 | 15 | 30 | 20 | 20 | 20 | 130 | 17.5 | 5.5 | PSGB15 |
| SPGN2020K-20T32 | 20 | 37 | 20 | 20 | 20 | 130 | 20 | 5.5 | PSGB20 |
| SPGN2525M-20T32 | 20 | 37 | 25 | 25 | 25 | 155 | 22.5 | 5.5 | PSGB20 |
| SPGN2525M-25T36 | 25 | 41 | 25 | 25 | 25 | 155 | 25 | 5.5 | PSGB25 |

• We can make special shape with forming insert (PSGB type) responding to customer's request.(1) Can be used with profile grooving inserts, only

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| SPGN*****-10T20 | CSTB-3L081 | T-8F |
| SPGN*****-15T25 | CSTB-4 | T-15F |
| SPGN*****-20T..., 25T... | CSTB-5 | T-20F |

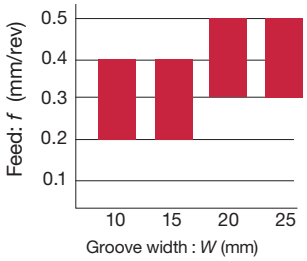
## PSGM



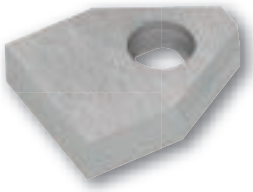
C127

For wide grooving
Excellent chip control

*W* = 10 - 25 mm




## PSGB

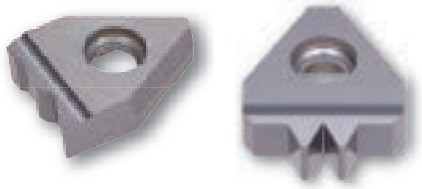


C127

Blank for profiling shape

*W* = 10 - 25 mm

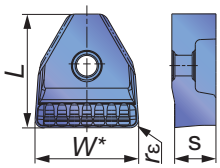
Specially tailored profile inserts





## INSERT

### For wide grooving

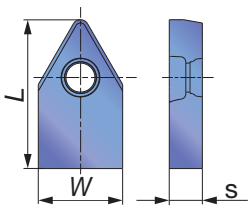



| Designation | W* | rε | Coating AH725 | L | s |
|---|---|---|---|---|---|
| PSGM10-08 | 10 | 0.8 | ● | 11 | 4 |
| PSGM15-15 | 15 | 1.5 | ● | 15 | 5 |
| PSGM20-20 | 20 | 2 | ● | 22 | 6.5 |
| PSGM25-20 | 25 | 2 | ● | 22 | 6.5 |

*: Tolerance *W* ± 0.08 (*W* = 10 mm), ± 0.1 (*W* ≥ 15 mm)

● : Line-up

### Blanks for wide profile grooving*

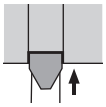



| Designation | W ± 0.025 | Uncoated UX30 | Uncoated TH10 | L | s |
|---|---|---|---|---|---|
| PSGB10 | 10.2 | ● | ● | 18 | 4 |
| PSGB15 | 15.2 | ● | ● | 20 | 5 |
| PSGB20 | 20.2 | ● | ● | 27 | 6.5 |
| PSGB25 | 25.2 | ● | ● | 27 | 6.5 |

● : Line-up

*Stocked products are blanks (semi-finished) for formed inserts

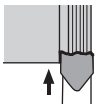
## STANDARD CUTTING CONDITIONS



### Wide grooving

| ISO | Workpiece material | Hardness (HB) | Grade | Cutting speed Vc (m/min) |
|---|---|---|---|---|
| P | Alloy steel 42CrMo4, etc. | < 300 | AH725 | 50 - 180 |
| P | Alloy steel 42CrMo4, etc. | < 300 | UX30 | 50 - 120 |

| PSGM type insert | Groove width: W (mm) 10 | 15 | 20 | 25 |
|---|---|---|---|---|
| Feed: f (mm/rev) | 0.2 - 0.4 | 0.2 - 0.4 | 0.3 - 0.5 | 0.3 - 0.5 |

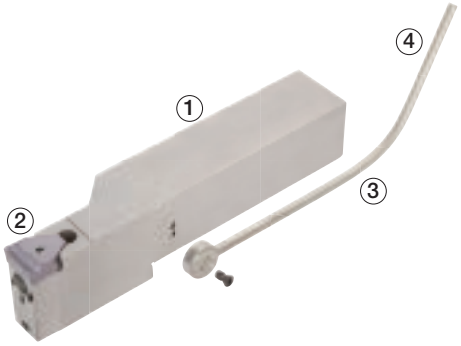


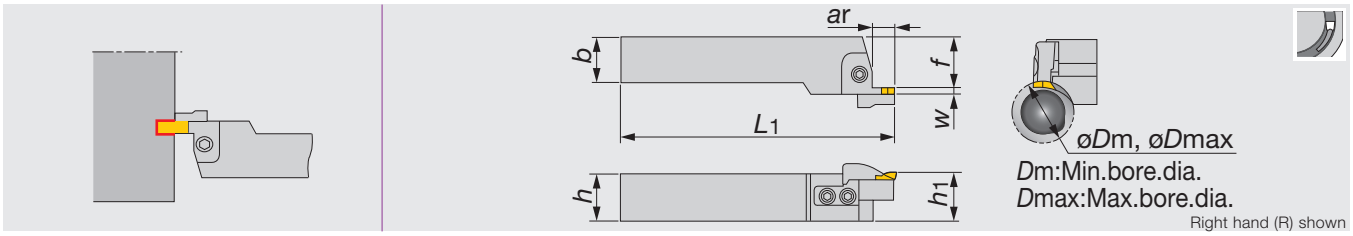
### Forming

| ISO | Workpiece material | Hardness (HB) | Grade | Cutting speed Vc (m/min) |
|---|---|---|---|---|
| P | Steel C45, etc. | < 200 | UX30 | 50 - 150 |
| P | Alloy steel 42CrMo4, etc. | < 300 | UX30 | 50 - 120 |
| M | Stainless steel X10CrNiS18-9, etc. | < 200 | UX30 | 50 - 120 |
| K | Grey cast iron 250, etc. | - | TH10 | 50 - 150 |
| K | Ductile cast iron 450-10S, etc. | - | TH10 | 50 - 120 |
| N | Aluminium alloy Si < 12%, etc. | - | TH10 | 100 - 500 |

## ■ Spare parts for internal coolant supply attachment (Order separately)

| No. | Parts name | Designation | Note |
|---|---|---|---|
| ① | Body | FPGR... | - |
| ② | Insert | PSGM... | - |
| ③ | Coolant supply attachment | SGCU-341 | - |
| ④ | Connector | Commercial items can be used | G 1/8 thread |
| | | | NPT 1/8 thread |






| Designation | W | øDm | øDmax | ar | h | b | L1 | h1 | f | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| CFGSR/L2020-3SA | 3 | 30 | 40 | 10 | 20 | 20 | 125 | 21 | 22 | FGC3 |
| CFGSR/L2020-3SB | 3 | 40 | 50 | 10 | 20 | 20 | 125 | 21 | 22 | FGC3 |
| CFGSR/L2020-3SC | 3 | 50 | 60 | 10 | 20 | 20 | 125 | 21 | 22 | FGC3 |
| CFGSR/L2020-3SD | 3 | 60 | 80 | 10 | 20 | 20 | 125 | 20.5 | 22 | FGC3 |
| CFGSR/L2020-3SE | 3 | 80 | 120 | 10 | 20 | 20 | 125 | 20.5 | 22 | FGC3 |
| CFGSR/L2525-3SA | 3 | 30 | 40 | 10 | 25 | 25 | 150 | 26 | 29 | FGC3 |
| CFGSR/L2525-3SB | 3 | 40 | 50 | 10 | 25 | 25 | 150 | 26 | 29 | FGC3 |
| CFGSR/L2525-3SC | 3 | 50 | 60 | 10 | 25 | 25 | 150 | 26 | 29 | FGC3 |
| CFGSR/L2525-3SD | 3 | 60 | 80 | 10 | 25 | 25 | 150 | 25.5 | 29 | FGC3 |
| CFGSR/L2525-3SE | 3 | 80 | 120 | 10 | 25 | 25 | 150 | 25.5 | 29 | FGC3 |
| CFGSR/L2020-4SA | 4 | 30 | 40 | 10 | 20 | 20 | 125 | 21 | 21 | FGC4 |
| CFGSR/L2020-4SB | 4 | 40 | 50 | 10 | 20 | 20 | 125 | 21 | 21 | FGC4 |
| CFGSR/L2020-4SC | 4 | 50 | 60 | 10 | 20 | 20 | 125 | 21 | 21 | FGC4 |
| CFGSR/L2020-4SD | 4 | 60 | 80 | 10 | 20 | 20 | 125 | 20.5 | 21 | FGC4 |
| CFGSR/L2020-4SE | 4 | 80 | 120 | 10 | 20 | 20 | 125 | 20.5 | 21 | FGC4 |
| CFGSR/L2525-4SA | 4 | 30 | 40 | 10 | 25 | 25 | 150 | 26 | 28 | FGC4 |
| CFGSR/L2525-4SB | 4 | 40 | 50 | 10 | 25 | 25 | 150 | 26 | 28 | FGC4 |
| CFGSR/L2525-4SC | 4 | 50 | 60 | 10 | 25 | 25 | 150 | 26 | 28 | FGC4 |
| CFGSR/L2525-4SD | 4 | 60 | 80 | 10 | 25 | 25 | 150 | 25.5 | 28 | FGC4 |
| CFGSR/L2525-4SE | 4 | 80 | 120 | 10 | 25 | 25 | 150 | 25.5 | 28 | FGC4 |
| CFGSR/L2525-4DA | 4 | 30 | 40 | 20 | 25 | 25 | 160 | 26 | 28 | FGC4 |
| CFGSR/L2525-4DB | 4 | 40 | 50 | 20 | 25 | 25 | 160 | 26 | 28 | FGC4 |
| CFGSR/L2525-4DC | 4 | 50 | 60 | 20 | 25 | 25 | 160 | 26 | 28 | FGC4 |
| CFGSR/L2525-4DD | 4 | 60 | 80 | 20 | 25 | 25 | 160 | 25.5 | 28 | FGC4 |
| CFGSR/L2525-4DE | 4 | 80 | 120 | 20 | 25 | 25 | 160 | 25.5 | 28 | FGC4 |
| CFGSR/L2020-5SA | 5 | 30 | 40 | 12 | 20 | 20 | 127 | 21 | 20 | FGC5 |
| CFGSR/L2020-5SB | 5 | 40 | 50 | 12 | 20 | 20 | 127 | 21 | 20 | FGC5 |
| CFGSR/L2020-5SC | 5 | 50 | 60 | 12 | 20 | 20 | 127 | 21 | 20 | FGC5 |
| CFGSR/L2020-5SD | 5 | 60 | 80 | 12 | 20 | 20 | 127 | 20.5 | 20 | FGC5 |
| CFGSR/L2020-5SE | 5 | 80 | 120 | 12 | 20 | 20 | 127 | 20.5 | 20 | FGC5 |
| CFGSR/L2525-5SA | 5 | 30 | 40 | 12 | 25 | 25 | 152 | 26 | 27 | FGC5 |
| CFGSR/L2525-5SB | 5 | 40 | 50 | 12 | 25 | 25 | 152 | 26 | 27 | FGC5 |
| CFGSR/L2525-5SC | 5 | 50 | 60 | 12 | 25 | 25 | 152 | 26 | 27 | FGC5 |
| CFGSR/L2525-5SD | 5 | 60 | 80 | 12 | 25 | 25 | 152 | 25.5 | 27 | FGC5 |
| CFGSR/L2525-5SE | 5 | 80 | 120 | 12 | 25 | 25 | 152 | 25.5 | 27 | FGC5 |
| CFGSR/L2525-5DA | 5 | 30 | 40 | 22 | 25 | 25 | 162 | 26 | 27 | FGC5 |
| CFGSR/L2525-5DB | 5 | 40 | 50 | 22 | 25 | 25 | 162 | 26 | 27 | FGC5 |
| CFGSR/L2525-5DC | 5 | 50 | 60 | 22 | 25 | 25 | 162 | 26 | 27 | FGC5 |
| CFGSR/L2525-5DD | 5 | 60 | 80 | 22 | 25 | 25 | 162 | 25.5 | 27 | FGC5 |
| CFGSR/L2525-5DE | 5 | 80 | 120 | 22 | 25 | 25 | 162 | 25.5 | 27 | FGC5 |
| CFGSR2525-6SB | 6 | 40 | 50 | 14 | 25 | 25 | 154 | 26 | 26 | FGC6 |
| CFGSR/L2525-6SC | 6 | 50 | 60 | 14 | 25 | 25 | 154 | 26 | 26 | FGC6 |
| CFGSR/L2525-6SD | 6 | 60 | 80 | 14 | 25 | 25 | 154 | 25.5 | 26 | FGC6 |
| CFGSR/L2525-6SE | 6 | 80 | 120 | 14 | 25 | 25 | 154 | 25.5 | 26 | FGC6 |
| CFGSR/L3232-8SD | 8 | 60 | 80 | 16 | 32 | 32 | 170 | 32.5 | 24.5 | FGC8 |
| CFGSR/L3232-8SE | 8 | 80 | 120 | 16 | 32 | 32 | 170 | 32.5 | 24.5 | FGC8 |

- Right hand toolholders are used in regular rotation. Left hand toolholders are used in reverse rotation.
- Each toolholder set includes all components.
- The right hand blade and clamp are used with the right hand shank, the left hand blade and clamp are used with the left hand shank.

| Designation | Shank | Blade | Clamp |
|---|---|---|---|
| CFGSR/L2020-3SA | CFGSR/L2020 | FBR/L25-3SA | CFG-3SR/L |
| CFGSR/L2020-3SB | CFGSR/L2020 | FBR/L25-3SB | CFG-3SR/L |
| CFGSR/L2020-3SC | CFGSR/L2020 | FBR/L25-3SC | CFG-3SR/L |
| CFGSR/L2020-3SD | CFGSR/L2020 | FBR/L25-3SD | CFG-3SR/L |
| CFGSR/L2020-3SE | CFGSR/L2020 | FBR/L25-3SE | CFG-3SR/L |
| CFGSR/L2525-3SA | CFGSR/L2525 | FBR/L25-3SA | CFG-3SR/L |
| CFGSR/L2525-3SB | CFGSR/L2525 | FBR/L25-3SB | CFG-3SR/L |
| CFGSR/L2525-3SC | CFGSR/L2525 | FBR/L25-3SC | CFG-3SR/L |
| CFGSR/L2525-3SD | CFGSR/L2525 | FBR/L25-3SD | CFG-3SR/L |
| CFGSR/L2525-3SE | CFGSR/L2525 | FBR/L25-3SE | CFG-3SR/L |
| CFGSR/L2020-4SA | CFGSR/L2020 | FBR/L25-4SA | CFG-4SR/L |
| CFGSR/L2020-4SB | CFGSR/L2020 | FBR/L25-4SB | CFG-4SR/L |
| CFGSR/L2020-4SC | CFGSR/L2020 | FBR/L25-4SC | CFG-4SR/L |
| CFGSR/L2020-4SD | CFGSR/L2020 | FBR/L25-4SD | CFG-4SR/L |
| CFGSR/L2020-4SE | CFGSR/L2020 | FBR/L25-4SE | CFG-4SR/L |
| CFGSR/L2525-4SA | CFGSR/L2525 | FBR/L25-4SA | CFG-4SR/L |
| CFGSR/L2525-4SB | CFGSR/L2525 | FBR/L25-4SB | CFG-4SR/L |
| CFGSR/L2525-4SC | CFGSR/L2525 | FBR/L25-4SC | CFG-4SR/L |
| CFGSR/L2525-4SD | CFGSR/L2525 | FBR/L25-4SD | CFG-4SR/L |
| CFGSR/L2525-4SE | CFGSR/L2525 | FBR/L25-4SE | CFG-4SR/L |
| CFGSR/L2525-4DA | CFGSR/L2525 | FBR/L25-4DA | CFG-4DR/L |
| CFGSR/L2525-4DB | CFGSR/L2525 | FBR/L25-4DB | CFG-4DR/L |
| CFGSR/L2525-4DC | CFGSR/L2525 | FBR/L25-4DC | CFG-4DR/L |
| CFGSR/L2525-4DD | CFGSR/L2525 | FBR/L25-4DD | CFG-4DR/L |
| CFGSR/L2525-4DE | CFGSR/L2525 | FBR/L25-4DE | CFG-4DR/L |
| CFGSR/L2020-5SA | CFGSR/L2020 | FBR/L25-5SA | CFG-5SR/L |
| CFGSR/L2020-5SB | CFGSR/L2020 | FBR/L25-5SB | CFG-5SR/L |
| CFGSR/L2020-5SC | CFGSR/L2020 | FBR/L25-5SC | CFG-5SR/L |
| CFGSR/L2020-5SD | CFGSR/L2020 | FBR/L25-5SD | CFG-5SR/L |
| CFGSR/L2020-5SE | CFGSR/L2020 | FBR/L25-5SE | CFG-5SR/L |
| CFGSR/L2525-5SA | CFGSR/L2525 | FBR/L25-5SA | CFG-5SR/L |
| CFGSR/L2525-5SB | CFGSR/L2525 | FBR/L25-5SB | CFG-5SR/L |
| CFGSR/L2525-5SC | CFGSR/L2525 | FBR/L25-5SC | CFG-5SR/L |
| CFGSR/L2525-5SD | CFGSR/L2525 | FBR/L25-5SD | CFG-5SR/L |
| CFGSR/L2525-5SE | CFGSR/L2525 | FBR/L25-5SE | CFG-5SR/L |
| CFGSR/L2525-5DA | CFGSR/L2525 | FBR/L25-5DA | CFG-5DR/L |
| CFGSR/L2525-5DB | CFGSR/L2525 | FBR/L25-5DB | CFG-5DR/L |
| CFGSR/L2525-5DC | CFGSR/L2525 | FBR/L25-5DC | CFG-5DR/L |
| CFGSR/L2525-5DD | CFGSR/L2525 | FBR/L25-5DD | CFG-5DR/L |
| CFGSR/L2525-5DE | CFGSR/L2525 | FBR/L25-5DE | CFG-5DR/L |
| CFGSR2525-6SB | CFGSR2525 | FBR25-6SB | CFG-6SR |
| CFGSR/L2525-6SC | CFGSR/L2525 | FBR/L25-6SC | CFG-6SR/L |
| CFGSR/L2525-6SD | CFGSR/L2525 | FBR/L25-6SD | CFG-6SR/L |
| CFGSR/L2525-6SE | CFGSR/L2525 | FBR/L25-6SE | CFG-6SR/L |
| CFGSR/L3232-8SD | CFGSR/L3232 | FBR/L32-8SD | CFG-8SR/L |
| CFGSR/L3232-8SE | CFGSR/L3232 | FBR/L32-8SE | CFG-8SR/L |

## SPARE PARTS



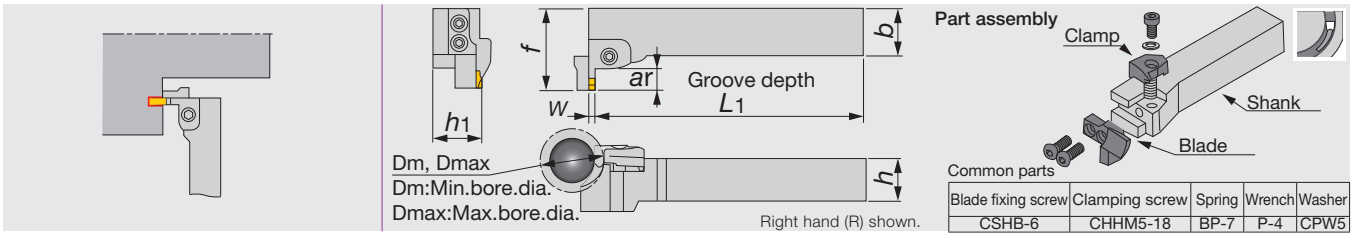





| Designation | Clamp | Clamping screw | Blade screw | Spring | Washer | Wrench |
|---|---|---|---|---|---|---|
| CFGSR/L2020-3SA | CFG-3SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2020-3SB | CFG-3SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2020-3SC | CFG-3SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2020-3SD | CFG-3SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2020-3SE | CFG-3SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2525-3SA | CFG-3SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2525-3SB | CFG-3SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2525-3SC | CFG-3SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2525-3SD | CFG-3SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2525-3SE | CFG-3SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2020-4SA | CFG-4SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2020-4SB | CFG-4SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2020-4SC | CFG-4SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2020-4SD | CFG-4SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2020-4SE | CFG-4SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2525-4SA | CFG-4SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2525-4SB | CFG-4SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2525-4SC | CFG-4SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2525-4SD | CFG-4SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2525-4SE | CFG-4SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2525-4DA | CFG-4DR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2525-4DB | CFG-4DR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2525-4DC | CFG-4DR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2525-4DD | CFG-4DR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2525-4DE | CFG-4DR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2020-5SA | CFG-5SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2020-5SB | CFG-5SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2020-5SC | CFG-5SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2020-5SD | CFG-5SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2020-5SE | CFG-5SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2525-5SA | CFG-5SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2525-5SB | CFG-5SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2525-5SC | CFG-5SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2525-5SD | CFG-5SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2525-5SE | CFG-5SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2525-5DA | CFG-5DR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2525-5DB | CFG-5DR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2525-5DC | CFG-5DR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2525-5DD | CFG-5DR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2525-5DE | CFG-5DR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2525-6SB | CFG-6SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2525-6SC | CFG-6SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2525-6SD | CFG-6SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2525-6SE | CFG-6SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L3232-8SD | CFG-8SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L3232-8SE | CFG-8SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |

MEMO

## Perpendicular toolholders for face grooving




| Blade fixing screw | Clamping screw | Spring | Wrench | Washer |
|---|---|---|---|---|
| CSHB-6 | CHHM5-18 | BP-7 | P-4 | CPW5 |

| Designation | W | øDm | øDmax | ar | h | b | L1 | h1 | f | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| CFGTR/L2020-3SA | 3 | 30 | 40 | 10 | 20 | 20 | 122 | 21 | 44 | FGC3 |
| CFGTR/L2020-3SB | 3 | 40 | 50 | 10 | 20 | 20 | 122 | 21 | 44 | FGC3 |
| CFGTR/L2020-3SC | 3 | 50 | 60 | 10 | 20 | 20 | 122 | 21 | 44 | FGC3 |
| CFGTR/L2020-3SD | 3 | 60 | 80 | 10 | 20 | 20 | 122 | 20.5 | 44 | FGC3 |
| CFGTR/L2020-3SE | 3 | 80 | 120 | 10 | 20 | 20 | 122 | 20.5 | 44 | FGC3 |
| CFGTR/L2525-3SA | 3 | 30 | 40 | 10 | 25 | 25 | 147 | 26 | 44 | FGC3 |
| CFGTR/L2525-3SB | 3 | 40 | 50 | 10 | 25 | 25 | 147 | 26 | 44 | FGC3 |
| CFGTR/L2525-3SC | 3 | 50 | 60 | 10 | 25 | 25 | 147 | 26 | 44 | FGC3 |
| CFGTR/L2525-3SD | 3 | 60 | 80 | 10 | 25 | 25 | 147 | 25.5 | 44 | FGC3 |
| CFGTR/L2525-3SE | 3 | 80 | 120 | 10 | 25 | 25 | 147 | 25.5 | 44 | FGC3 |
| CFGTR/L2020-4SA | 4 | 30 | 40 | 10 | 20 | 20 | 121 | 21 | 44. | FGC4 |
| CFGTR/L2020-4SB | 4 | 40 | 50 | 10 | 20 | 20 | 121 | 21 | 44 | FGC4 |
| CFGTR/L2020-4SC | 4 | 50 | 60 | 10 | 20 | 20 | 121 | 21 | 44 | FGC4 |
| CFGTR/L2020-4SD | 4 | 60 | 80 | 10 | 20 | 20 | 121 | 20.5 | 44 | FGC4 |
| CFGTR/L2020-4SE | 4 | 80 | 120 | 10 | 20 | 20 | 121 | 20.5 | 44. | FGC4 |
| CFGTR/L2525-4SA | 4 | 30 | 40 | 10 | 25 | 25 | 146 | 26 | 44 | FGC4 |
| CFGTR/L2525-4SB | 4 | 40 | 50 | 10 | 25 | 25 | 146 | 26 | 44 | FGC4 |
| CFGTR/L2525-4SC | 4 | 50 | 60 | 10 | 25 | 25 | 146 | 26 | 44 | FGC4 |
| CFGTR/L2525-4SD | 4 | 60 | 80 | 10 | 25 | 25 | 146 | 25.5 | 44 | FGC4 |
| CFGTR/L2525-4SE | 4 | 80 | 120 | 10 | 25 | 25 | 146 | 25.5 | 44 | FGC4 |
| CFGTR/L2525-4DA | 4 | 30 | 40 | 20 | 25 | 25 | 146 | 26 | 54 | FGC4 |
| CFGTR/L2525-4DB | 4 | 40 | 50 | 20 | 25 | 25 | 146 | 26 | 54 | FGC4 |
| CFGTR/L2525-4DC | 4 | 50 | 60 | 20 | 25 | 25 | 146 | 26 | 54 | FGC4 |
| CFGTR/L2525-4DD | 4 | 60 | 80 | 20 | 25 | 25 | 146 | 25.5 | 54 | FGC4 |
| CFGTR/L2525-4DE | 4 | 80 | 120 | 20 | 25 | 25 | 146 | 25.5 | 54 | FGC4 |
| CFGTR/L2020-5SA | 5 | 30 | 40 | 12 | 20 | 20 | 120 | 21 | 46 | FGC5 |
| CFGTR/L2020-5SB | 5 | 40 | 50 | 12 | 20 | 20 | 120 | 21 | 46 | FGC5 |
| CFGTR/L2020-5SC | 5 | 50 | 60 | 12 | 20 | 20 | 120 | 21 | 46 | FGC5 |
| CFGTR/L2020-5SD | 5 | 60 | 80 | 12 | 20 | 20 | 120 | 20.5 | 46 | FGC5 |
| CFGTR/L2020-5SE | 5 | 80 | 120 | 12 | 20 | 20 | 120 | 20.5 | 46 | FGC5 |
| CFGTR/L2525-5SA | 5 | 30 | 40 | 12 | 25 | 25 | 145 | 26 | 46 | FGC5 |
| CFGTR/L2525-5SB | 5 | 40 | 50 | 12 | 25 | 25 | 145 | 26 | 46 | FGC5 |
| CFGTR/L2525-5SC | 5 | 50 | 60 | 12 | 25 | 25 | 145 | 26 | 46 | FGC5 |
| CFGTR/L2525-5SD | 5 | 60 | 80 | 12 | 25 | 25 | 145 | 25.5 | 46 | FGC5 |
| CFGTR/L2525-5SE | 5 | 80 | 120 | 12 | 25 | 25 | 145 | 25.5 | 46 | FGC5 |
| CFGTR/L2525-5DA | 5 | 30 | 40 | 22 | 25 | 25 | 145 | 26 | 56 | FGC5 |
| CFGTR/L2525-5DB | 5 | 40 | 50 | 22 | 25 | 25 | 145 | 26 | 56 | FGC5 |
| CFGTR/L2525-5DC | 5 | 50 | 60 | 22 | 25 | 25 | 145 | 26 | 56 | FGC5 |
| CFGTR/L2525-5DD | 5 | 60 | 80 | 22 | 25 | 25 | 145 | 25.5 | 56 | FGC5 |
| CFGTR/L2525-5DE | 5 | 80 | 120 | 22 | 25 | 25 | 145 | 25.5 | 56 | FGC5 |
| CFGTR/L2525-6SB | 6 | 40 | 50 | 14 | 25 | 25 | 144 | 26. | 48 | FGC6 |
| CFGTR2525-6SC | 6 | 50 | 60 | 14 | 25 | 25 | 144 | 26 | 48 | FGC6 |
| CFGTR2525-6SD | 6 | 60 | 80 | 14 | 25 | 25 | 144 | 25.5 | 48 | FGC6 |
| CFGTR/L2525-6SE | 6 | 80 | 120 | 14 | 25 | 25 | 144 | 25.5 | 48 | FGC6 |
| CFGTR3232-8SD | 8 | 60 | 80 | 16 | 32 | 32 | 162 | 32.5 | 50 | FGC8 |
| CFGTR/L3232-8SE | 8 | 80 | 120 | 16 | 32 | 32 | 162 | 32.5 | 50 | FGC8 |

- When using these face grooving toolholders, right hand ones use a right hand bladeset and left hand ones are left hand bladeset.
- Each toolholder set includes all components.
- The right hand blade and clamp are used with the right hand shank, the left hand blade and clamp are used with the left hand shank.

| Designation | Shank | Blade | Clamp |
|---|---|---|---|
| CFGTR/L2020-3SA | CFGTR/L2020 | FBR/L25-3SA | CFG-3SR/L |
| CFGTR/L2020-3SB | CFGTR/L2020 | FBR/L25-3SB | CFG-3SR/L |
| CFGTR/L2020-3SC | CFGTR/L2020 | FBR/L25-3SC | CFG-3SR/L |
| CFGTR/L2020-3SD | CFGTR/L2020 | FBR/L25-3SD | CFG-3SR/L |
| CFGTR/L2020-3SE | CFGTR/L2020 | FBR/L25-3SE | CFG-3SR/L |
| CFGTR/L2525-3SA | CFGTR/L2525 | FBR/L25-3SA | CFG-3SR/L |
| CFGTR/L2525-3SB | CFGTR/L2525 | FBR/L25-3SB | CFG-3SR/L |
| CFGTR/L2525-3SC | CFGTR/L2525 | FBR/L25-3SC | CFG-3SR/L |
| CFGTR/L2525-3SD | CFGTR/L2525 | FBR/L25-3SD | CFG-3SR/L |
| CFGTR/L2525-3SE | CFGTR/L2525 | FBR/L25-3SE | CFG-3SR/L |
| CFGTR/L2020-4SA | CFGTR/L2020 | FBR/L25-4SA | CFG-4SR/L |
| CFGTR/L2020-4SB | CFGTR/L2020 | FBR/L25-4SB | CFG-4SR/L |
| CFGTR/L2020-4SC | CFGTR/L2020 | FBR/L25-4SC | CFG-4SR/L |
| CFGTR/L2020-4SD | CFGTR/L2020 | FBR/L25-4SD | CFG-4SR/L |
| CFGTR/L2020-4SE | CFGTR/L2020 | FBR/L25-4SE | CFG-4SR/L |
| CFGTR/L2525-4SA | CFGTR/L2525 | FBR/L25-4SA | CFG-4SR/L |
| CFGTR/L2525-4SB | CFGTR/L2525 | FBR/L25-4SB | CFG-4SR/L |
| CFGTR/L2525-4SC | CFGTR/L2525 | FBR/L25-4SC | CFG-4SR/L |
| CFGTR/L2525-4SD | CFGTR/L2525 | FBR/L25-4SD | CFG-4SR/L |
| CFGTR/L2525-4SE | CFGTR/L2525 | FBR/L25-4SE | CFG-4SR/L |
| CFGTR/L2525-4DA | CFGTR/L2525 | FBR/L25-4DA | CFG-4DR/L |
| CFGTR/L2525-4DB | CFGTR/L2525 | FBR/L25-4DB | CFG-4DR/L |
| CFGTR/L2525-4DC | CFGTR/L2525 | FBR/L25-4DC | CFG-4DR/L |
| CFGTR/L2525-4DD | CFGTR/L2525 | FBR/L25-4DD | CFG-4DR/L |
| CFGTR/L2525-4DE | CFGTR/L2525 | FBR/L25-4DE | CFG-4DR/L |
| CFGTR/L2020-5SA | CFGTR/L2020 | FBR/L25-5SA | CFG-5SR/L |
| CFGTR/L2020-5SB | CFGTR/L2020 | FBR/L25-5SB | CFG-5SR/L |
| CFGTR/L2020-5SC | CFGTR/L2020 | FBR/L25-5SC | CFG-5SR/L |
| CFGTR/L2020-5SD | CFGTR/L2020 | FBR/L25-5SD | CFG-5SR/L |
| CFGTR/L2020-5SE | CFGTR/L2020 | FBR/L25-5SE | CFG-5SR/L |
| CFGTR/L2525-5SA | CFGTR/L2525 | FBR/L25-5SA | CFG-5SR/L |
| CFGTR/L2525-5SB | CFGTR/L2525 | FBR/L25-5SB | CFG-5SR/L |
| CFGTR/L2525-5SC | CFGTR/L2525 | FBR/L25-5SC | CFG-5SR/L |
| CFGTR/L2525-5SD | CFGTR/L2525 | FBR/L25-5SD | CFG-5SR/L |
| CFGTR/L2525-5SE | CFGTR/L2525 | FBR/L25-5SE | CFG-5SR/L |
| CFGTR/L2525-5DA | CFGTR/L2525 | FBR/L25-5DA | CFG-5DR/L |
| CFGTR/L2525-5DB | CFGTR/L2525 | FBR/L25-5DB | CFG-5DR/L |
| CFGTR/L2525-5DC | CFGTR/L2525 | FBR/L25-5DC | CFG-5DR/L |
| CFGTR/L2525-5DD | CFGTR/L2525 | FBR/L25-5DD | CFG-5DR/L |
| CFGTR/L2525-5DE | CFGTR/L2525 | FBR/L25-5DE | CFG-5DR/L |
| CFGTR/L2525-6SB | CFGTR/L2525 | FBR/L25-6SB | CFG-6SR/L |
| CFGTR2525-6SC | CFGTR2525 | FBR25-6SC | CFG-6SR |
| CFGTR2525-6SD | CFGTR2525 | FBR25-6SD | CFG-6SR |
| CFGTR/L2525-6SE | CFGTR/L2525 | FBR/L25-6SE | CFG-6SR/L |
| CFGTR3232-8SD | CFGTR3232 | FBR32-8SD | CFG-8SR |
| CFGTR/L3232-8SE | CFGTR/L3232 | FBR/L32-8SE | CFG-8SR/L |

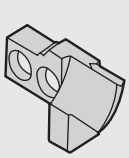
## SPARE PARTS

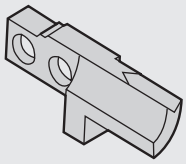
| Designation | Clamp | Clamping screw | Blade screw | Spring | Washer | Wrench |
|---|---|---|---|---|---|---|
| CFGTR/L2020-3SA | CFG-3SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2020-3SB | CFG-3SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2020-3SC | CFG-3SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2020-3SD | CFG-3SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2020-3SE | CFG-3SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2525-3SA | CFG-3SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2525-3SB | CFG-3SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2525-3SC | CFG-3SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2525-3SD | CFG-3SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2525-3SE | CFG-3SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2020-4SA | CFG-4SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2020-4SB | CFG-4SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2020-4SC | CFG-4SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2020-4SD | CFG-4SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2020-4SE | CFG-4SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2525-4SA | CFG-4SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2525-4SB | CFG-4SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2525-4SC | CFG-4SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2525-4SD | CFG-4SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2525-4SE | CFG-4SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2525-4DA | CFG-4DR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2525-4DB | CFG-4DR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2525-4DC | CFG-4DR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2525-4DD | CFG-4DR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2525-4DE | CFG-4DR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2020-5SA | CFG-5SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2020-5SB | CFG-5SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2020-5SC | CFG-5SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2020-5SD | CFG-5SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2020-5SE | CFG-5SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2525-5SA | CFG-5SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2525-5SB | CFG-5SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2525-5SC | CFG-5SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2525-5SD | CFG-5SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2525-5SE | CFG-5SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2525-5DA | CFG-5DR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2525-5DB | CFG-5DR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2525-5DC | CFG-5DR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2525-5DD | CFG-5DR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2525-5DE | CFG-5DR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2525-6SB | CFG-6SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR2525-6SC | CFG-6SR | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR2525-6SD | CFG-6SR | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2525-6SE | CFG-6SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR3232-8SD | CFG-8SR | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L3232-8SE | CFG-8SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |

## FBR/L-#S/D

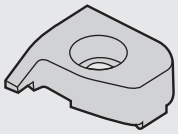
Blades of toolholder CFGSR/L-#S/D & CFGTR/L-#S/D for face grooving

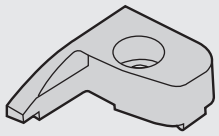
**Blade**
Shallow groove type (FBR/L□-□S□) Deep groove type (FBR/L□□-□D□)





**Clamp**
Shallow groove type (CFG-□SR/L)
Deep groove type (CFG-□DR/L)





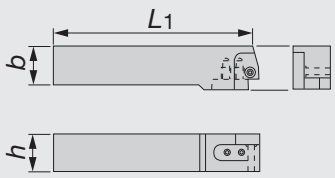
Right hand (R) shown.

| Blade | Min. bore dia. ø*D*m | *ar* | *W* | Clamp |
|---|---|---|---|---|
| FBR/L25-3SA | 30 - 40 | 10 | 3 | CFG-3SR/L |
| FBR/L25-3SB | 40 - 50 | 10 | 3 | CFG-3SR/L |
| FBR/L25-3SC | 50 - 60 | 10 | 3 | CFG-3SR/L |
| FBR/L25-3SD | 60 - 80 | 10 | 3 | CFG-3SR/L |
| FBR/L25-3SE | 80 - 120 | 10 | 3 | CFG-3SR/L |
| FBR/L25-4SA | 30 - 40 | 10 | 4 | CFG-4SR/L |
| FBR/L25-4SB | 40 - 50 | 10 | 4 | CFG-4SR/L |
| FBR/L25-4SC | 50 - 60 | 10 | 4 | CFG-4SR/L |
| FBR/L25-4SD | 60 - 80 | 10 | 4 | CFG-4SR/L |
| FBR/L25-4SE | 80 - 120 | 10 | 4 | CFG-4SR/L |
| FBR/L25-4DA | 30 - 40 | 20 | 4 | CFG-4DR/L |
| FBR/L25-4DB | 40 - 50 | 20 | 4 | CFG-4DR/L |
| FBR/L25-4DC | 50 - 60 | 20 | 4 | CFG-4DR/L |
| FBR/L25-4DD | 60 - 80 | 20 | 4 | CFG-4DR/L |
| FBR/L25-4DE | 80 - 120 | 20 | 4 | CFG-4DR/L |
| FBR/L25-5SA | 30 - 40 | 12 | 5 | CFG-5SR/L |
| FBR/L25-5SB | 40 - 50 | 12 | 5 | CFG-5SR/L |
| FBR/L25-5SC | 50 - 60 | 12 | 5 | CFG-5SR/L |
| FBR/L25-5SD | 60 - 80 | 12 | 5 | CFG-5SR/L |
| FBR/L25-5SE | 80 - 120 | 12 | 5 | CFG-5SR/L |

| Blade | Min. bore dia. ø*D*m | *ar* | *W* | Clamp |
|---|---|---|---|---|
| FBR/L25-5DA | 30 - 40 | 22 | 5 | CFG-5DR/L |
| FBR/L25-5DB | 40 - 50 | 22 | 5 | CFG-5DR/L |
| FBR/L25-5DC | 50 - 60 | 22 | 5 | CFG-5DR/L |
| FBR/L25-5DD | 60 - 80 | 22 | 5 | CFG-5DR/L |
| FBR/L25-5DE | 80 - 120 | 22 | 5 | CFG-5DR/L |
| FBR/L25-6SB | 40 - 50 | 14 | 6 | CFG-6SR/L |
| FBR/L25-6SC | 50 - 60 | 14 | 6 | CFG-6SR/L |
| FBR/L25-6SD | 60 - 80 | 14 | 6 | CFG-6SR/L |
| FBR/L25-6SE | 80 - 120 | 14 | 6 | CFG-6SR/L |
| FBR25-6DB | 40 - 50 | 24 | 6 | CFG-6DR |
| FBR/L25-6DC | 50 - 60 | 24 | 6 | CFG-6DR/L |
| FBR/L25-6DD | 60 - 80 | 24 | 6 | CFG-6DR/L |
| FBR/L25-6DE | 80 - 120 | 24 | 6 | CFG-6DR/L |
| FBR32-8SD | 60 - 80 | 16 | 8 | CFG-8SR |
| FBR32-8SE | 80 - 120 | 16 | 8 | CFG-8SR |
| FBR32-8DD | 60 - 80 | 26 | 8 | CFG-8DR |
| FBR32-8DE | 80 - 120 | 26 | 8 | CFG-8DR |

## CFGSR/L

Shank of toolholder CFGSR/L-#S/D for face grooving




Right hand (R) shown.

| Designation | h | b | L1 |
|---|---|---|---|
| CFGSR/L2020 | 20 | 20 | 114.3 |
| CFGSR/L2525 | 25 | 25 | 139.3 |
| CFGSR3232 | 32 | 32 | 153.3 |

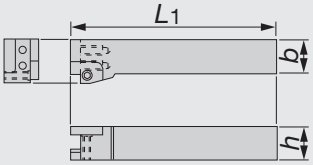
SPARE PARTS



| Designation | Clamping screw | Blade screw | Spring | Washer | Wrench |
|---|---|---|---|---|---|
| CFGSR/L... | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |

## CFGTR/L

Shank of perpendicular toolholder CFGTR/L-#S/D for face grooving




Right hand (R) shown.

| Designation | h | b | L1 |
|---|---|---|---|
| CFGTR/L2020 | 20 | 20 | 125.8 |
| CFGTR/L2525 | 25 | 25 | 150.8 |
| CFGTR/L3232 | 32 | 32 | 170.8 |

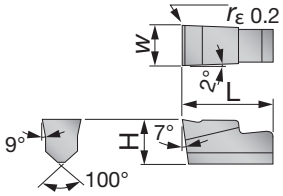
SPARE PARTS



| Designation | Clamping screw | Blade screw | Spring | Washer | Wrench |
|---|---|---|---|---|---|
| CFGTR/L... | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |

## INSERT

### FGC




Right hand (R) shown.

| Designation | W±0.1 | Coating | Cermet | Uncoated | L | H |
|---|---|---|---|---|---|---|
| | | T313V | NS9530 | UX30 | | |
| FGC3 | 3 | ● | ● | | 10 | 4.29 |
| FGC4 | 4 | ● | ● | | 10 | 4.5 |
| FGC5 | 5 | ● | ● | | 12 | 5.5 |
| FGC6 | 6 | | | ● | 14 | 6.5 |
| FGC8 | 8 | | | ● | 16 | 8 |

● : Line-up

## Grade selection guide

| Grades | Main applications | P group | | | | K group | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 01 | 10 | 20 | 30 | 01 | 10 | 20 | 30 |
| **UX30** | Low to medium speed cutting of steel, cast steel, cast iron and stainless steel | | ■ | ■ | ■ | | ■ | ■ | ■ |
| **NS9530** | Medium to high speed cutting of steel and alloy steel, with satisfactory surface finish | | ■ | ■ | | | | | |
| **T313V** | Low to high speed cutting of steel, cast steel, cast iron and stainless steel Standard cutting conditions | | ■ | ■ | | | ■ | ■ | |

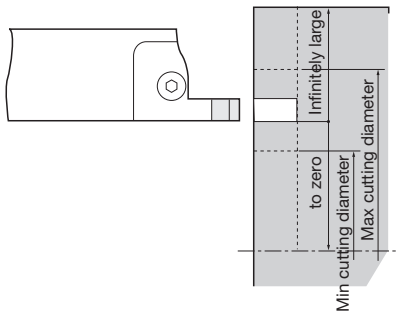
## STANDARD CUTTING CONDITIONS

| Workpiece material: General carbon steel, C45 Cutting fluid: Water soluble cutting fluid | Groove width: *W* (mm) | | | | |
|---|---|---|---|---|---|
| | 3 | 4 | 5 | 6 | 8 |
| **Cutting speed $v_c$ (m/min)** | 70 ~ 150 | 70 ~ 150 | 70 ~ 120 | 70 ~ 120 | 50 ~ 100 |
| **Feed *f* (mm/rev)** | 0.05 ~ 0.15 | 0.05 ~ 0.2 | 0.05 ~ 0.15 | 0.05 ~ 0.15 | 0.05 ~ 0.1 |

Notes:
- Above cutting conditions are applied to the shallow groove type (groove depth 10 ~ 16 mm).
- In the case of a deep groove type (groove depth 20 ~ 26 mm), apply 60 ~ 70% of above cutting conditions.
- The use of water soluble cutting fluid is recommended to discharge chips, protect the finished surface, and prevent chipping.

## Notes on cutting diameter

- SA~SG types can widen the groove outward infinitely after grooving from the minimum to maximum diameter.
- SF and SG types can widen the groove inward to minimum zero after grooving from the minimum to maximum diameter. (See the figure)
- SA~SE types can not be used to widen the groove more inward from the minimum diameter.



# MillLine



# MILLING


 High-Feed Milling D002

 Shoulder Milling D032

 Face Milling D118

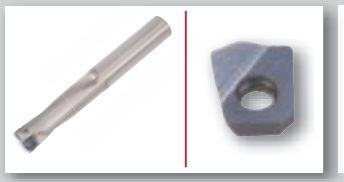
 Slot Milling D172

 Profile Milling D188

 Multi-Functional Milling D224

 Milling Insert D316





## HYBRIDTACMILL

D004

High-feed endmills

20° ø10 - ø16 mm
max. ap 0.8 mm

P M K N



## DOFEED

D008

Super high-feed milling cutters with 4-cornered double-sided inserts

15° ø16 - ø200 mm
max. ap 1.5 mm

P M K S H



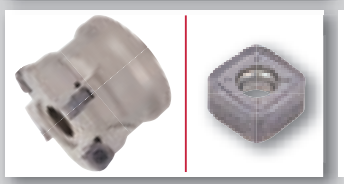
## DO TWIST BALL

D016

Super high-feed cutters for profile milling with rigid clamping

20° ø20 - ø50 mm
max. ap 1.3 mm

P M K S H



## DOFEEDQUAD

D021

Super high-feed cutters for face milling with 8-cornered double-sided inserts

13° ø50 - ø125 mm
max. ap 2 mm

P M K S H



## MILLQUADFEED

D024

Super high-feed milling cutters for large depths of cut

14° ø50 - ø160 mm
max. ap 2.5 mm

P M K S H



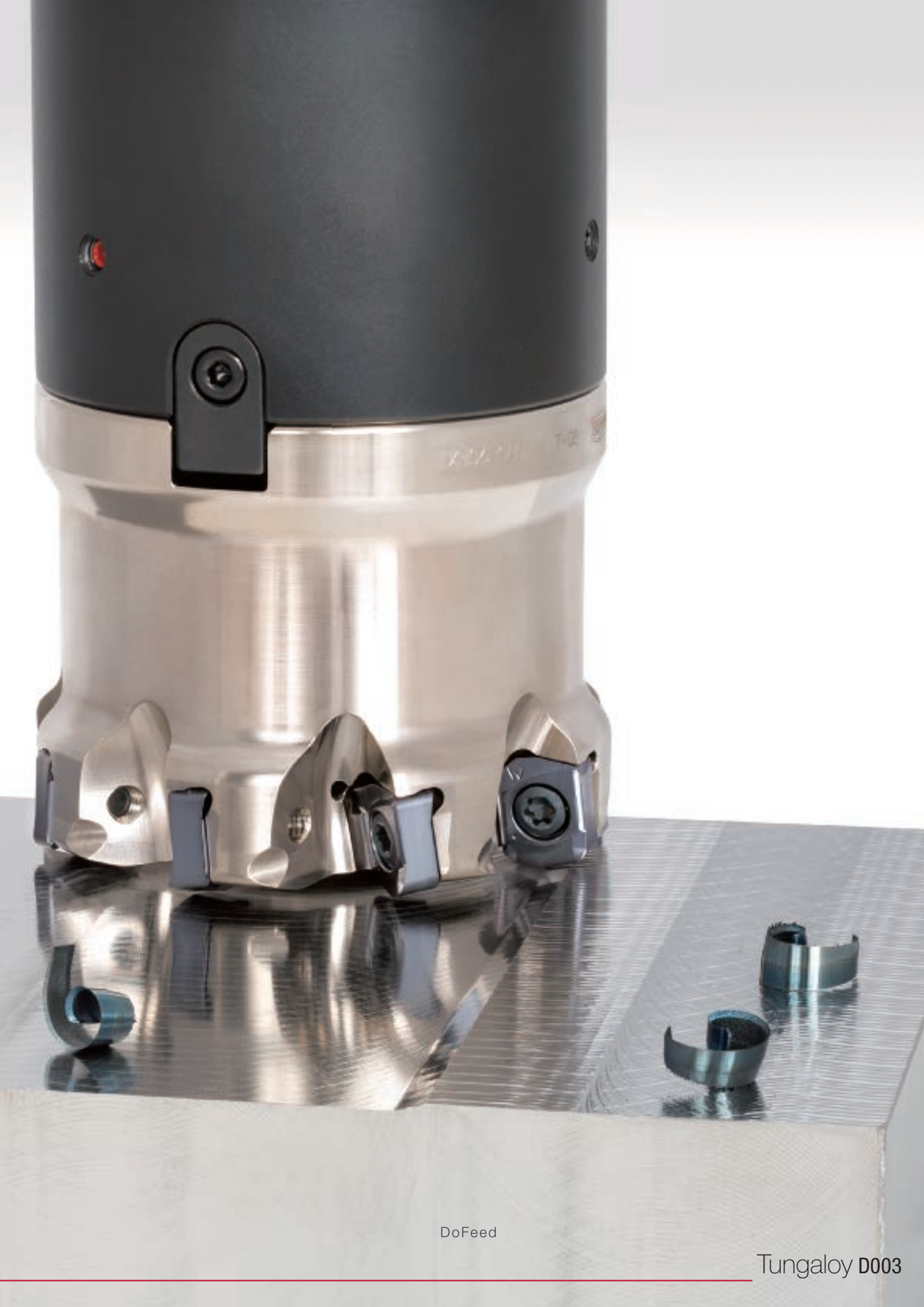
## MILLFEED

D026

High-feed milling cutters with single-sided inserts

10°-20° ø20 - ø125 mm
max. ap 3 mm

P M K H



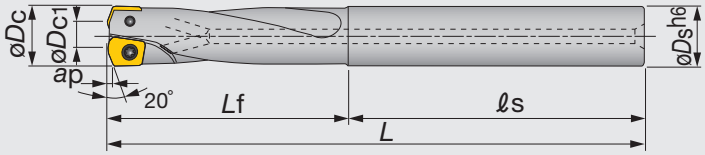
DoFeed

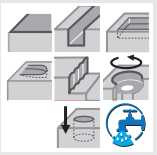
# HYBRIDTACMILL
## EXH

Super high feed milling endmills with center cutting edge

A.R. = +20°, R.R. = +12°





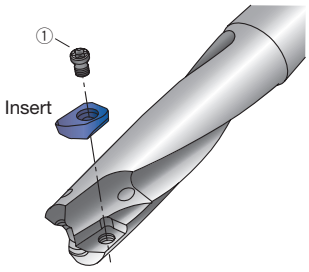



Right hand (R) shown.

| Designation | Max. *ap* | ø*D*c | z | ø*D*c1 | ø*D*s | *L* | *L*f | ℓs | Insert |
|---|---|---|---|---|---|---|---|---|---|
| EXH06R010M10.0-02 | 0.6 | 10 | 2 | 5 | 10 | 90 | 40 | 50 | XXGT06H2... |
| EXH07R012M12.0-02 | 0.6 | 12 | 2 | 7 | 12 | 98 | 48 | 50 | XXGT07X3... |
| EXH09R016M16.0-02 | 0.8 | 16 | 2 | 10 | 16 | 124 | 64 | 60 | XXGT09X4... |

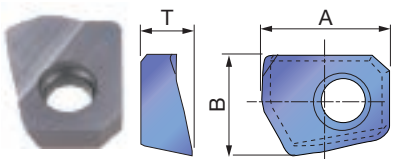
### SPARE PARTS

| Designation | ①Clamping screw | Lubricant | Wrench | Wrench 1 |
|---|---|---|---|---|
| EXH06R010M10.0-02 | CSPD-1.8S | M-1000 | - | IP-6F |
| EXH07R012M12.0-02 | CSPB-2H | M-1000 | - | IP-6F |
| EXH09R016M16.0-02 | CSPB-2.5S | M-1000 | IP-8D | - |

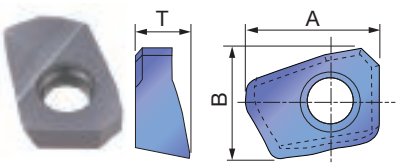


## INSERT

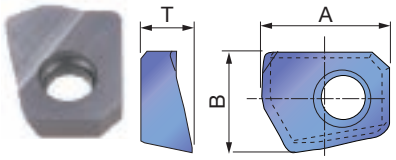
### XXGT EC-MJ (Center cutting edge)



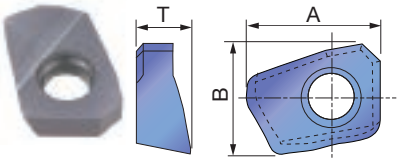

### XXGT EP-MJ (Peripheral cutting edge)




### XXGT FC-AJ (Center cutting edge)




### XXGT FP-AJ (Peripheral cutting edge)




| | | AH730 | DS1200 |
|---|---|---|---|
| P | Steel | ★ | |
| M | Stainless | ★ | |
| K | Cast iron | ★ | |
| N | Non-ferrous | | ★ |
| S | Superalloys | | |
| H | Hard materials | | |

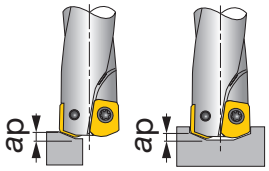
★ : First choice
☆ : Second choice

| Designation | Max. ap | Coating AH730 | Coating DS1200 | A | B | T |
|---|---|---|---|---|---|---|
| XXGT06H205EC-MJ | 0.6 | ● | | 6.2 | 4.9 | 2.5 |
| XXGT07X305EC-MJ | 0.6 | ● | | 7 | 5.9 | 3 |
| XXGT09X408EC-MJ | 0.8 | ● | | 8.9 | 7.9 | 4 |
| XXGT06H205FC-AJ | 0.6 | | ● | 6.2 | 4.9 | 2.5 |
| XXGT07X305FC-AJ | 0.6 | | ● | 7 | 5.9 | 3 |
| XXGT09X408FC-AJ | 0.8 | | ● | 8.9 | 7.9 | 4 |
| XXGT06H205EP-MJ | 0.6 | ● | | 6.2 | 5.1 | 2.5 |
| XXGT07X305EP-MJ | 0.6 | ● | | 7 | 6.3 | 3 |
| XXGT09X408EP-MJ | 0.8 | ● | | 8.9 | 8 | 4 |
| XXGT06H205FP-AJ | 0.6 | | ● | 6.2 | 5.1 | 2.5 |
| XXGT07X305FP-AJ | 0.6 | | ● | 7 | 6.3 | 3 |
| XXGT09X408FP-AJ | 0.8 | | ● | 8.9 | 8 | 4 |

●: Line-up

## STANDARD CUTTING CONDITIONS

●Shoulder milling, Slotting

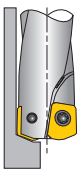



Side cutting Slotting

ap: Axial depth of cut

| Workpiece material | | Carbon steels and alloy steels | | Alloy steels and prehardened steelst | | Stainless steels | | Cast irons | | Aluminium alloys (Si < 13%) | | Aluminium alloys (Si ≥ 13%) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | | < 30HRC | | 30 ~ 40HRC | | < 250HB | | – | | – | | – | |
| Cutting speed | | Vc = 100 ~ 300 m/min | | Vc = 100 ~ 250 m/min | | Vc = 100 ~ 300 m/min | | Vc = 100 ~ 300 m/min | | Vc = 100 ~ 500 m/min | | Vc = 100 ~ 300 m/min | |
| Conditions | | No. of rev. n min⁻¹ | Feed speed Vf mm/min | No. of rev. n min⁻¹ | Feed speed Vf mm/min | No. of rev. n min⁻¹ | Feed speed Vf mm/min | No. of rev. n min⁻¹ | Feed speed Vf mm/min | No. of rev. n min⁻¹ | Feed speed Vf mm/min | No. of rev. n min⁻¹ | Feed speed Vf mm/min |
| Tool dia. (mm) | ø10 | 4770 | 1430 | 3820 | 760 | 4770 | 1430 | 6360 | 2540 | 9550 | 5730 | 6360 | 3180 |
| | ø12 | 3980 | 1190 | 3180 | 630 | 3980 | 1190 | 5300 | 2120 | 7950 | 4770 | 5300 | 2650 |
| | ø16 | 2980 | 890 | 2380 | 470 | 2980 | 890 | 3970 | 1580 | 5960 | 3570 | 3970 | 1980 |
| Depth of cut | ø10 | ap < 0.6 | | ap < 0.5 | | ap < 0.6 | | ap < 0.6 | | ap < 0.6 | | ap < 0.6 | |
| | ø12 | ap < 0.6 | | ap < 0.5 | | ap < 0.6 | | ap < 0.6 | | ap < 0.6 | | ap < 0.6 | |
| | ø16 | ap < 0.8 | | ap < 0.6 | | ap < 0.8 | | ap < 0.8 | | ap < 0.8 | | ap < 0.8 | |

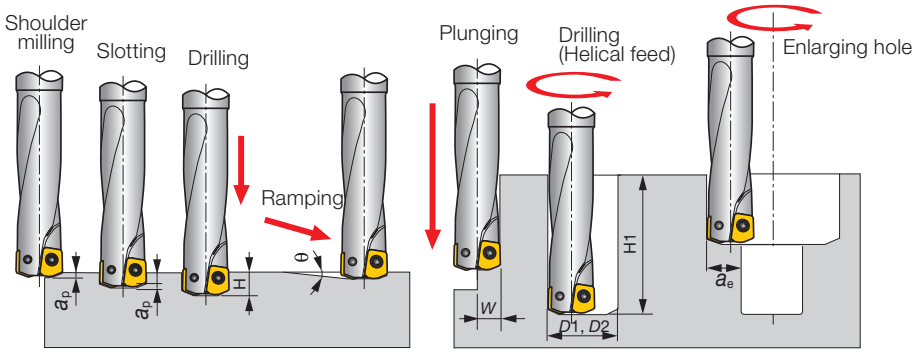
●Plunging



| Workpiece material | | Carbon steels and alloy steels | | Alloy steels and prehardened steelst | | Stainless steels | | Cast irons | | Aluminium alloys (Si < 13%) | | Aluminium alloys (Si ≥ 13%) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | | < 30HRC | | 30 ~ 40HRC | | < 250HB | | – | | – | | – | |
| Cutting speed | | Vc = 100 ~ 300 m/min | | Vc = 100 ~ 250 m/min | | Vc = 100 ~ 300 m/min | | Vc = 100 ~ 300 m/min | | Vc = 100 ~ 500 m/min | | Vc = 100 ~ 300 m/min | |
| Conditions | | No. of rev. n min⁻¹ | Feed speed Vf mm/min | No. of rev. n min⁻¹ | Feed speed Vf mm/min | No. of rev. n min⁻¹ | Feed speed Vf mm/min | No. of rev. n min⁻¹ | Feed speed Vf mm/min | No. of rev. n min⁻¹ | Feed speed Vf mm/min | No. of rev. n min⁻¹ | Feed speed Vf mm/min |
| Tool dia. (mm) | ø10 | 4770 | 240 | 3820 | 150 | 4770 | 240 | 6360 | 440 | 9550 | 760 | 6360 | 440 |
| | ø12 | 3980 | 200 | 3180 | 130 | 3980 | 200 | 5300 | 370 | 7950 | 640 | 5300 | 370 |
| | ø16 | 2980 | 150 | 2380 | 95 | 2980 | 150 | 3970 | 280 | 5960 | 480 | 3970 | 280 |

Note:
- In slotting or pocketing where chips tend to stay in the cutting zone, use an air blast to remove chips for preventing chip recutting.
- When chips tend to weld excessively on the cutting edge such as in machining aluminium alloys, use a water soluble cutting fluid.
- In the case of cutting a casting skin or a heavily interrupted work surface, decrease the feed per tooth and the maximum depth of cut to 1/2 to 2/3 times the values shown in the table.
- Tool overhang length must be as short as possible to avoid chatter. When the tool overhang length is long, decrease the number of revolutions and feed.
- Cutting conditions are generally limited by the rigidity and power of the machine and the rigidity of the workpiece. When setting the conditions, start from half of the values of the standard cutting conditions and then increase the value gradually whilst making sure that the machine is running normally.

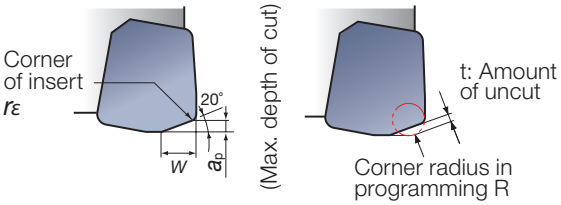
## APPLICATION RANGE




| Designation | Tool dia. øDc | Max. depth of cut ap | Max.depth of drilling H | Max. cutting width in plunging W | Max. ramping angle θ° | Min. machinable hole dia. D1 | Max. machinable hole dia. D2 | Max. cutting width in enlarging hole ae | Max.depth of boring H1 |
|---|---|---|---|---|---|---|---|---|---|
| EXH06R010M10.0-02 | 10 | 0.6 | 5 | 5 | 5 | 12 | 19 | 7 | 30 |
| EXH07R012M12.0-02 | 12 | 0.6 | 6 | 6 | 5 | 14 | 23 | 9 | 36 |
| EXH09R016M16.0-02 | 16 | 0.8 | 8 | 8 | 5 | 18 | 31 | 12.5 | 48 |

## TOOL GEOMETRY ON PROGRAM

When using CAD/CAM, please program it as for radius cutter.
The following table shows actual cutting edge geometry and amount of unfinished work cut.




| Designation | øDc | Max. depth of cut ap | Corner of insert rε | Wide of tooth W | Amount of uncut t | Corner radius in programming R |
|---|---|---|---|---|---|---|
| EXH06R010M10.0-02 | 10 | 0.6 | 0.5 | 2.5 | 0.7<br>0.6 | R0.5<br>R1.0 |
| EXH07R012M12.0-02 | 12 | 0.6 | 0.5 | 2.5 | 0.7<br>0.6 | R0.5<br>R1.0 |
| EXH09R016M16.0-02 | 16 | 0.8 | 0.8 | 3 | 0.8<br>0.7<br>0.6 | R0.5<br>R1.0<br>R1.5 |

MEMO

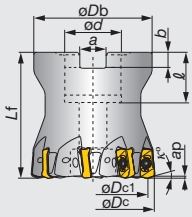
DOFEED

## TXN03

Super high feed milling cutters with double sided inserts with 4 edges

A.R. = +6°, R.R. = +12° ~ 13°








| Designation | Max. *ap* | ø*Dc* | z | ø*Dc1* | ø*Db* | ø*d* | *ℓ* | *Lf* | *b* | *a* | *κ°* | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TXN03R040M16.0E05 | 1 | 40 | 5 | 33.6 | 35 | 16 | 18 | 40 | 5.6 | 8.4 | 17 | 0.2 | with | LNMU03... |
| TXN03R040M16.0E06 | 1 | 40 | 6 | 33.6 | 35 | 16 | 18 | 40 | 5.6 | 8.4 | 17 | 0.2 | with | LNMU03... |
| TXN03R050M22.0E05 | 1 | 50 | 5 | 43.6 | 47 | 22 | 20 | 50 | 6.3 | 10.4 | 17 | 0.5 | with | LNMU03... |
| TXN03R050M22.0E08 | 1 | 50 | 8 | 43.6 | 47 | 22 | 20 | 50 | 6.3 | 10.4 | 17 | 0.5 | with | LNMU03... |

### SPARE PARTS






| Designation | Clamping screw | Lubricant | Shell locking bolt | Wrench |
|---|---|---|---|---|
| TXN03R04... | CSPB-2.5 | M-1000 | CM8X30H | IP-8D |
| TXN03R05... | CSPB-2.5 | M-1000 | CM10X30H | IP-8D |

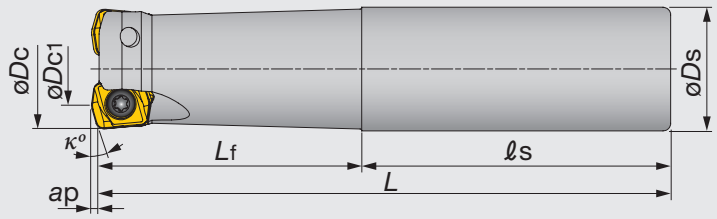
DOFEED

## EXN03

Super high feed milling endmills with double sided inserts with 4 edges

A.R. = +6°, R.R. = +5° ~ +11°








| Designation | Max. *ap* | ø*Dc* | z | ø*Dc1* | ø*Ds* | *L* | *Lf* | *ℓs* | *κ°* | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EXN03R016M16.0-02 | 1 | 16 | 2 | 9.6 | 16 | 100 | 30 | 70 | 15 | 0.2 | with | LNMU03... |
| EXN03R016M16.0-02L | 1 | 16 | 2 | 9.6 | 16 | 150 | 50 | 100 | 15 | 0.2 | with | LNMU03... |
| EXN03R018M16.0-02 | 1 | 18 | 2 | 11.5 | 16 | 100 | 30 | 70 | 17 | 0.2 | with | LNMU03... |
| EXN03R018M16.0-02L | 1 | 18 | 2 | 11.5 | 16 | 150 | 25 | 125 | 17 | 0.2 | with | LNMU03... |
| EXN03R020M20.0-03 | 1 | 20 | 3 | 13.5 | 20 | 130 | 50 | 80 | 17 | 0.3 | with | LNMU03... |
| EXN03R020M20.0-03L | 1 | 20 | 3 | 13.5 | 20 | 160 | 80 | 80 | 17 | 0.3 | with | LNMU03... |
| EXN03R020M20.0-04 | 1 | 20 | 4 | 13.5 | 20 | 130 | 50 | 80 | 17 | 0.3 | with | LNMU03... |
| EXN03R022M20.0-03 | 1 | 22 | 3 | 15.5 | 20 | 130 | 50 | 80 | 17 | 0.3 | with | LNMU03... |
| EXN03R022M20.0-03L | 1 | 22 | 3 | 15.5 | 20 | 160 | 30 | 130 | 17 | 0.4 | with | LNMU03... |
| EXN03R022M20.0-04 | 1 | 22 | 4 | 15.5 | 20 | 130 | 50 | 80 | 17 | 0.3 | with | LNMU03... |
| EXN03R025M25.0-04 | 1 | 25 | 4 | 18.5 | 25 | 140 | 60 | 80 | 17 | 0.5 | with | LNMU03... |
| EXN03R025M25.0-04L | 1 | 25 | 4 | 18.5 | 25 | 180 | 100 | 80 | 17 | 0.6 | with | LNMU03... |
| EXN03R025M25.0-05 | 1 | 25 | 5 | 18.5 | 25 | 140 | 60 | 80 | 17 | 0.5 | with | LNMU03... |
| EXN03R028M25.0-04 | 1 | 28 | 4 | 21.5 | 25 | 140 | 60 | 80 | 17 | 0.5 | with | LNMU03... |
| EXN03R028M25.0-04L | 1 | 28 | 4 | 21.5 | 25 | 180 | 35 | 145 | 17 | 0.7 | with | LNMU03... |
| EXN03R028M25.0-05 | 1 | 28 | 5 | 21.5 | 25 | 140 | 60 | 80 | 17 | 0.5 | with | LNMU03... |
| EXN03R030M32.0-04 | 1 | 30 | 4 | 23.5 | 32 | 150 | 70 | 80 | 17 | 0.8 | with | LNMU03... |
| EXN03R030M32.0-04L | 1 | 30 | 4 | 23.5 | 32 | 200 | 120 | 80 | 17 | 0.9 | with | LNMU03... |
| EXN03R030M32.0-05 | 1 | 30 | 5 | 23.5 | 32 | 150 | 70 | 80 | 17 | 0.8 | with | LNMU03... |
| EXN03R032M32.0-05 | 1 | 32 | 5 | 25.5 | 32 | 150 | 70 | 80 | 17 | 0.8 | with | LNMU03... |
| EXN03R032M32.0-05L | 1 | 32 | 5 | 25.5 | 32 | 200 | 120 | 80 | 17 | 1.1 | with | LNMU03... |
| EXN03R032M32.0-06 | 1 | 32 | 6 | 25.5 | 32 | 150 | 70 | 80 | 17 | 0.9 | with | LNMU03... |
| EXN03R035M32.0-05 | 1 | 35 | 5 | 28.5 | 32 | 150 | 35 | 115 | 17 | 0.9 | with | LNMU03... |
| EXN03R035M32.0-05L | 1 | 35 | 5 | 28.5 | 32 | 200 | 35 | 165 | 17 | 1.2 | with | LNMU03... |
| EXN03R035M32.0-06 | 1 | 35 | 6 | 28.5 | 32 | 150 | 35 | 115 | 17 | 0.9 | with | LNMU03... |

### SPARE PARTS





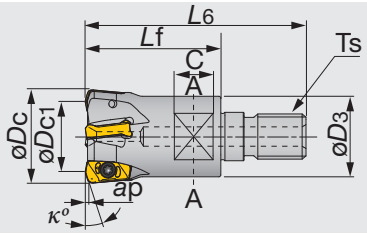
| Designation | Clamping screw | Lubricant | Wrench |
|---|---|---|---|
| EXN03... | CSPB-2.5 | M-1000 | IP-8D |

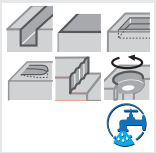
# HXN03-M

## Super high feed milling endmills (Dofeed) with TungFlex

A.R. = +6°, R.R. = +5° ~ +11°





| Designation | Max. ap | øDc | z | øDc1 | L6 | Lf | C | T | øD3 | κ° | Ts | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HXN03R016MM08-02 | 1 | 16 | 2 | 9.5 | 42 | 25 | 8 | 10 | 12.8 | 15 | M8 | 0.03 | with | LNMU03... |
| HXN03R018MM08-02 | 1 | 18 | 2 | 11.5 | 42 | 25 | 8 | 10 | 14.5 | 17 | M8 | 0.04 | with | LNMU03... |
| HXN03R020MM10-03 | 1 | 20 | 3 | 13.5 | 49 | 30 | 10 | 15 | 17.8 | 17 | M10 | 0.06 | with | LNMU03... |
| HXN03R020MM10-04 | 1 | 20 | 4 | 13.5 | 49 | 30 | 10 | 15 | 17.8 | 17 | M10 | 0.06 | with | LNMU03... |
| HXN03R022MM10-03 | 1 | 22 | 3 | 15.5 | 49 | 30 | 10 | 15 | 17.8 | 17 | M10 | 0.06 | with | LNMU03... |
| HXN03R022MM10-04 | 1 | 22 | 4 | 15.5 | 49 | 30 | 10 | 15 | 17.8 | 17 | M10 | 0.07 | with | LNMU03... |
| HXN03R025MM12-04 | 1 | 25 | 4 | 18.5 | 57 | 35 | 10 | 17 | 20.8 | 17 | M12 | 0.1 | with | LNMU03... |
| HXN03R025MM12-05 | 1 | 25 | 5 | 18.5 | 57 | 35 | 10 | 17 | 20.8 | 17 | M12 | 0.11 | with | LNMU03... |
| HXN03R028MM12-04 | 1 | 28 | 4 | 21.5 | 57 | 35 | 10 | 17 | 23 | 17 | M12 | 0.12 | with | LNMU03... |
| HXN03R028MM12-05 | 1 | 28 | 5 | 21.5 | 57 | 35 | 10 | 17 | 23 | 17 | M12 | 0.12 | with | LNMU03... |
| HXN03R030MM16-04 | 1 | 30 | 4 | 23.5 | 63 | 40 | 12 | 22 | 28.8 | 17 | M16 | 0.19 | with | LNMU03... |
| HXN03R030MM16-05 | 1 | 30 | 5 | 23.5 | 63 | 40 | 12 | 22 | 28.8 | 17 | M16 | 0.2 | with | LNMU03... |
| HXN03R032MM16-05 | 1 | 32 | 5 | 25.5 | 63 | 40 | 12 | 22 | 28.8 | 17 | M16 | 0.2 | with | LNMU03... |
| HXN03R032MM16-06 | 1 | 32 | 6 | 25.5 | 63 | 40 | 12 | 22 | 28.8 | 17 | M16 | 0.21 | with | LNMU03... |

### SPARE PARTS



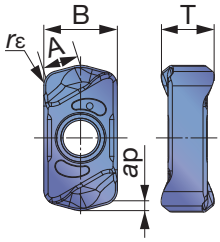


| Designation | Clamping screw | Lubricant | Wrench |
|---|---|---|---|
| HXN03... | CSPB-2.5 | M-1000 | IP-8D |

## INSERT

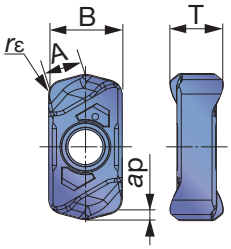
### LNMU03-MJ(for general purpose)






### LNMU03-ML(for low cutting force)






| | | | | |
|---|---|---|---|---|
| P | Steel | | ★ | ★ |
| M | Stainless | ★ | ☆ | ☆ |
| K | Cast iron | | ☆ | |
| N | Non-ferrous | | | |
| S | Superalloys | ☆ | ★ | |
| H | Hard materials | | ★ | ★ |

★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | Coating AH130 | Coating AH725 | Coating AH3035 | A | B | T |
|---|---|---|---|---|---|---|---|---|
| LNMU0303ZER-MJ | 1.2 | 1 | ● | ● | ● | 3.2 | 6 | 4.3 |
| LNMU0303ZER-ML | 1.2 | 1 | ● | ● | ● | 3.2 | 6 | 4.3 |

●: Line-up

# STANDARD CUTTING CONDITIONS TXN03/EXN03/HXN03

| ISO | Workpiece material | Hard-ness | Priority | Grade | Chip-breaker | Cutting speed *Vc* (m/min) | Feed per tooth: *fz* (mm/t) Tool dia.: ø*Dc* (mm) ø16 ~ ø22 | ø25 ~ ø50 | Plung-ing | ø16, z = 2 *n* | *Vf* | ø18, z = 2 *n* | *Vf* | ø20 *n* | *Vf* z = 3 | z = 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Carbon steel C45, C55, etc. | ~ 300HB | First choice | AH725 | MJ | 100 - 300 | 0.5 - 1.2 | 0.5 - 1.5 | 0.1 | 3,980 | 6,370 | 3,540 | 5,660 | 3,180 | 7,630 | 10,180 |
| | | | | | | | | | | *Vc* = 200 m/min, *fz* = 0.8 mm/t | | | | | | |
| | | ~ 300HB | For low cutting force | AH725 | ML | 100 - 300 | 0.5 - 0.7 | 0.5 - 1 | 0.1 | 3,980 | 4,780 | 3,540 | 4,250 | 3,180 | 5,720 | 7,630 |
| | | | | | | | | | | *Vc* = 200 m/min, *fz* = 0.6 mm/t | | | | | | |
| | | ~ 300HB | For impact resistance | AH3035 | MJ | 100 - 300 | 0.5 - 1.2 | 0.5 - 1.5 | 0.1 | 3,980 | 6,370 | 3,540 | 5,660 | 3,180 | 7,630 | 10,180 |
| | | | | | | | | | | *Vc* = 200 m/min, *fz* = 0.8 mm/t | | | | | | |
| | Alloy steel 42CrMo4, 17Cr3, etc. | ~ 300HB | First choice | AH725 | MJ | 100 - 200 | 0.5 - 1.2 | 0.5 - 1.5 | 0.1 | 2,980 | 4,770 | 2,650 | 4,240 | 2,390 | 5,740 | 7,650 |
| | | | | | | | | | | *Vc* = 150 m/min, *fz* = 0.8 mm/t | | | | | | |
| | | ~ 300HB | For low cutting force | AH725 | ML | 100 - 200 | 0.5 - 0.7 | 0.5 - 1 | 0.1 | 2,980 | 3,580 | 2,650 | 3,180 | 2,390 | 4,300 | 5,740 |
| | | | | | | | | | | *Vc* = 150 m/min, *fz* = 0.6 mm/t | | | | | | |
| | | ~ 300HB | For impact resistance | AH3035 | MJ | 100 - 200 | 0.5 - 1.2 | 0.5 - 1.5 | 0.1 | 2,980 | 4,770 | 2,650 | 4,240 | 2,390 | 5,740 | 7,650 |
| | | | | | | | | | | *Vc* = 150 m/min, *fz* = 0.8 mm/t | | | | | | |
| | Prehardened steel NAK80, PX5, etc. | 30 ~ 40HRC | - | AH3035 | ML | 100 - 200 | 0.5 - 0.7 | 0.5 - 1 | 0.1 | 2,980 | 3,580 | 2,650 | 3,180 | 2,390 | 4,300 | 5,740 |
| | | | | | | | | | | *Vc* = 150 m/min, *fz* = 0.6 mm/t | | | | | | |
| M | Stainless steel X5CrNi18-10, X5CrNiMo17-12-2, etc. | ~ 200HB | First choice | AH130 | ML | 100 - 150 | 0.3 - 0.5 | 0.3 - 0.7 | 0.08 | 2,390 | 1,910 | 2,120 | 1,700 | 1,910 | 2,290 | 3,060 |
| | | | | | | | | | | *Vc* = 120 m/min, *fz* = 0.4 mm/t | | | | | | |
| | | ~ 200HB | For impact resistance | AH130 | MJ | 100 - 150 | 0.3 - 0.8 | 0.3 - 0.8 | 0.08 | 2,390 | 2,390 | 2,120 | 2,120 | 1,910 | 2,870 | 3,820 |
| | | | | | | | | | | *Vc* = 120 m/min, *fz* = 0.5 mm/t | | | | | | |
| K | Grey cast iron GG25, GGG30, etc. | 150 ~ 250HB | First choice | AH725 | MJ | 100 - 300 | 0.5 - 1.2 | 0.5 - 1.5 | 0.1 | 3,980 | 6,370 | 3,540 | 5,660 | 3,180 | 7,630 | 10,180 |
| | | | | | | | | | | *Vc* = 200 m/min, *fz* = 0.8 mm/t | | | | | | |
| | | 150 ~ 250HB | For low cutting force | AH725 | ML | 100 - 300 | 0.5 - 0.7 | 0.5 - 1 | 0.1 | 3,980 | 4,780 | 3,540 | 4,250 | 3,180 | 5,720 | 7,630 |
| | | | | | | | | | | *Vc* = 200 m/min, *fz* = 0.6 mm/t | | | | | | |
| | Ductile cast iron GGG40, etc. | 150 ~ 250HB | First choice | AH725 | MJ | 80 - 200 | 0.5 - 1.2 | 0.5 - 1.5 | 0.1 | 2,980 | 4,770 | 2,650 | 4,240 | 2,390 | 5,740 | 7,650 |
| | | | | | | | | | | *Vc* = 150 m/min, *fz* = 0.8 mm/t | | | | | | |
| | | 150 ~ 250HB | For low cutting force | AH725 | ML | 80 - 200 | 0.5 - 0.7 | 0.5 - 1 | 0.1 | 2,980 | 3,580 | 2,650 | 3,180 | 2,390 | 4,300 | 5,740 |
| | | | | | | | | | | *Vc* = 150 m/min, *fz* = 0.6 mm/t | | | | | | |
| S | Titanium alloys Ti-6Al-4V, etc. | ~ 40HRC | - | AH725 | ML | 30 - 60 | 0.3 - 0.5 | 0.3 - 0.7 | 0.08 | 800 | 640 | 710 | 570 | 640 | 770 | 1,020 |
| | | | | | | | | | | *Vc* = 40 m/min, *fz* = 0.4 mm/t | | | | | | |
| | Heat-resistant alloys Inconel, Hastelloy, etc. | ~ 40HRC | - | AH725 | MJ | 20 - 50 | 0.1 - 0.2 | 0.1 - 0.3 | 0.05 | 600 | 180 | 530 | 160 | 480 | 216 | 290 |
| | | | | | | | | | | *Vc* = 30 m/min, *fz* = 0.15 mm/t | | | | | | |
| H | Hardened steel X40CrMoV5-1, etc. | 40 ~ 50HRC | First choice | AH3035 | MJ | 80 - 130 | 0.1 - 0.2 | 0.1 - 0.3 | 0.05 | 1,990 | 600 | 1,770 | 530 | 1,590 | 720 | 950 |
| | | | For wear resistance | AH725 | | | | | | *Vc* = 100 m/min, *fz* = 0.15 mm/t | | | | | | |
| | Hardened steel X153CrMoV12, etc. | 50 ~ 60HRC | First choice | AH725 | MJ | 50 - 70 | 0.03 - 0.05 | 0.03 - 0.07 | 0.03 | 1,190 | 100 | 1,060 | 80 | 950 | 114 | 150 |
| | | | For impact resistance | AH3035 | | | | | | *Vc* = 60 m/min, *fz* = 0.04 mm/t | | | | | | |

When chips stay in the cutting zone during slotting or pocketing, use air blast to remove chips from the work area.

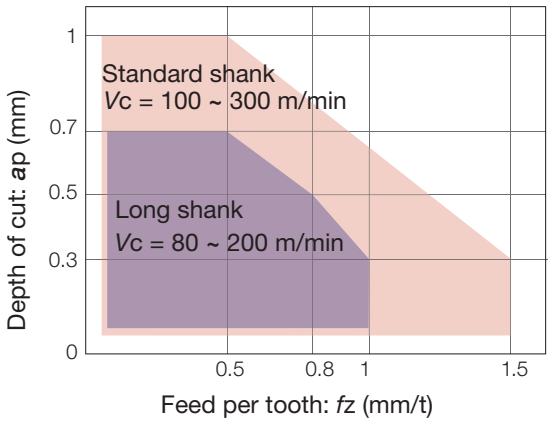
Tool overhang length must be as short as possible to avoid chatter. When the tool overhang length is long, decrease the number of revolutions and feed.



# CAUTIONARY POINTS IN USE

## The use of a standard or long shank

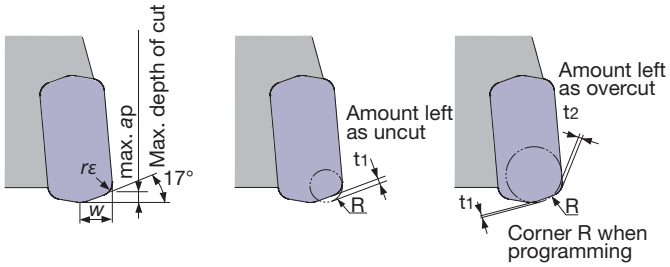
When using a long shank, please lower the cutting conditions (*Vc*, *fz*, *ap*) to 70% of the maximum conditions for the standard shank.




Tool dia.: ø*Dc* = ø16 ~ 35 mm
Workpiece material: C55 (200HB)
**L/D ratio of overhang**
Standard shank: L/D ≤ 3
Long shank: L/D = 4

## Tool geometry on program

When programming for CAM, the tool should be considered as a radius cutters. Usually, the corner radius should be set as R = 1.5 mm. If a larger radius is used, overcutting will occur. The following table shows the amount left as uncut ($t_1$) and overcut ($t_2$).




| Max. depth of cut max. *ap* | Corner radius *rε* | *W* (mm) | Corner R when program-ming | Amount left as uncut $t_1$ | Amount left as overcut $t_2$ |
|---|---|---|---|---|---|
| 1 | 1.2 | 3 | 1 | 0.6 | - |
| | | | 1.5 | 0.5 | - |
| | | | 2 | 0.25 | 0.08 |
| | | | 2.5 | 0.14 | 0.26 |

Each value in table is calculated theoretically at the maximum condition.

Tool dia.: ø*Dc* (mm), Number of revolutions: *n* (min$^{-1}$), Feed speed: *Vf* (mm/min), Max. depth of cut: *ap* = 1.0 mm

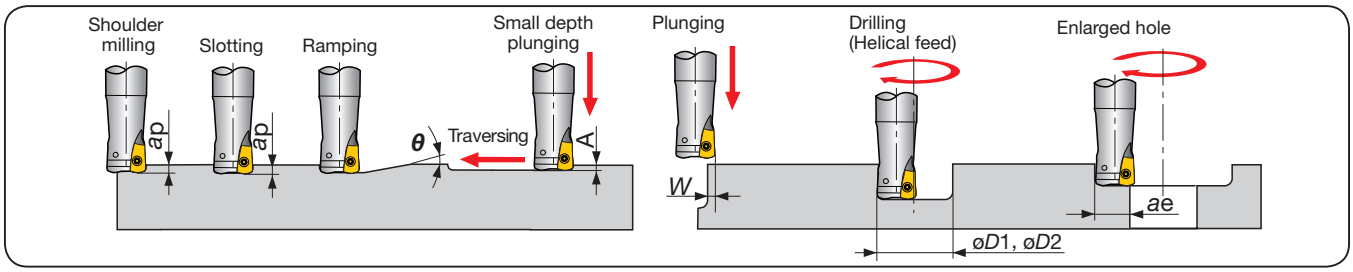
| ø22 | | | ø25 | | | ø28 | | | ø30 | | | ø32 | | | ø35 | | | ø40 | | | ø50 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *n* | *Vf* | | *n* | *Vf* | | *n* | *Vf* | | *n* | *Vf* | | *n* | *Vf* | | *n* | *Vf* | | *n* | *Vf* | | *n* | *Vf* | |
| | z = 3 | z = 4 | | z = 4 | z = 5 | | z = 4 | z = 5 | | z = 4 | z = 5 | | z = 5 | z = 6 | | z = 5 | z = 6 | | z = 5 | z = 6 | | z = 5 | z = 8 |
| 2,890 | 6,940 | 9,250 | 2,550 | 10,200 | 12,750 | 2,270 | 9,080 | 11,350 | 2,120 | 8,480 | 10,600 | 1,990 | 9,950 | 11,940 | 1,820 | 9,100 | 10,920 | 1,590 | 7,950 | 9,540 | 1,270 | 6,350 | 10,160 |
| | | | *Vc* = 200 m/min, *fz* = 1 mm/t | | | | | | | | | | | | | | | | | | | | |
| 2,890 | 5,200 | 6,940 | 2,550 | 8,160 | 10,200 | 2,270 | 7,260 | 9,080 | 2,120 | 6,780 | 8,480 | 1,990 | 7,960 | 9,550 | 1,820 | 7,280 | 8,740 | 1,590 | 6,360 | 7,630 | 1,270 | 5,080 | 8,130 |
| | | | *Vc* = 200 m/min, *fz* = 0.8 mm/t | | | | | | | | | | | | | | | | | | | | |
| 2,890 | 6,940 | 9,250 | 2,550 | 10,200 | 12,750 | 2,270 | 9,080 | 11,350 | 2,120 | 8,480 | 10,600 | 1,990 | 9,950 | 11,940 | 1,820 | 9,100 | 10,920 | 1,590 | 7,950 | 9,540 | 1,270 | 6,350 | 10,160 |
| | | | *Vc* = 200 m/min, *fz* = 1 mm/t | | | | | | | | | | | | | | | | | | | | |
| 2,170 | 5,210 | 6,940 | 1,910 | 7,640 | 9,550 | 1,710 | 6,840 | 8,550 | 1,590 | 6,360 | 7,950 | 1,490 | 7,450 | 8,940 | 1,360 | 6,800 | 8,160 | 1,190 | 5,950 | 7,140 | 950 | 4,750 | 5,700 |
| | | | *Vc* = 150 m/min, *fz* = 1 mm/t | | | | | | | | | | | | | | | | | | | | |
| 2,170 | 3,910 | 5,210 | 1,910 | 6,110 | 7,640 | 1,710 | 5,470 | 6,840 | 1,590 | 5,090 | 6,360 | 1,490 | 5,960 | 7,150 | 1,360 | 5,440 | 6,530 | 1,190 | 4,760 | 5,710 | 950 | 3,800 | 4,560 |
| | | | *Vc* = 150 m/min, *fz* = 0.8 mm/t | | | | | | | | | | | | | | | | | | | | |
| 2,170 | 5,210 | 6,940 | 1,910 | 7,640 | 9,550 | 1,710 | 6,840 | 8,550 | 1,590 | 6,360 | 7,950 | 1,490 | 7,450 | 8,940 | 1,360 | 6,800 | 8,160 | 1,190 | 5,950 | 7,140 | 950 | 4,750 | 5,700 |
| | | | *Vc* = 150 m/min, *fz* = 1 mm/t | | | | | | | | | | | | | | | | | | | | |
| 2,170 | 3,910 | 5,210 | 1,910 | 6,110 | 7,640 | 1,710 | 5,470 | 6,840 | 1,590 | 5,090 | 6,360 | 1,490 | 5,960 | 7,150 | 1,360 | 5,440 | 6,530 | 1,190 | 4,760 | 5,710 | 950 | 3,800 | 4,560 |
| | | | *Vc* = 150 m/min, *fz* = 0.8 mm/t | | | | | | | | | | | | | | | | | | | | |
| 1,740 | 2,090 | 2,780 | 1,530 | 3,060 | 3,830 | 1,360 | 2,720 | 3,400 | 1,270 | 2,540 | 3,180 | 1,190 | 2,980 | 3,570 | 1,090 | 2,730 | 3,270 | 950 | 2,380 | 2,850 | 760 | 1,900 | 3,040 |
| | | | *Vc* = 120 m/min, *fz* = 0.5 mm/t | | | | | | | | | | | | | | | | | | | | |
| 1,740 | 2,610 | 3,480 | 1,530 | 3,670 | 4,590 | 1,360 | 3,264 | 4,080 | 1,270 | 3,050 | 3,810 | 1,190 | 3,570 | 4,280 | 1,090 | 3,270 | 3,920 | 950 | 2,850 | 3,420 | 760 | 2,280 | 3,650 |
| | | | *Vc* = 120 m/min, *fz* = 0.6 mm/t | | | | | | | | | | | | | | | | | | | | |
| 2,890 | 6,940 | 9,250 | 2,550 | 10,200 | 12,750 | 2,270 | 9,080 | 11,350 | 2,120 | 8,480 | 10,600 | 1,990 | 9,950 | 11,940 | 1,820 | 9,100 | 10,920 | 1,590 | 7,950 | 9,540 | 1,270 | 6,350 | 10,160 |
| | | | *Vc* = 200 m/min, *fz* = 1 mm/t | | | | | | | | | | | | | | | | | | | | |
| 2,890 | 5,200 | 6,940 | 2,550 | 8,160 | 10,200 | 2,270 | 7,260 | 9,080 | 2,120 | 6,780 | 8,480 | 1,990 | 7,960 | 9,550 | 1,820 | 7,280 | 8,740 | 1,590 | 6,360 | 7,630 | 1,270 | 5,080 | 8,130 |
| | | | *Vc* = 200 m/min, *fz* = 0.8 mm/t | | | | | | | | | | | | | | | | | | | | |
| 2,170 | 5,210 | 6,940 | 1,910 | 7,640 | 9,550 | 1,710 | 6,840 | 8,550 | 1,590 | 6,360 | 7,950 | 1,490 | 7,450 | 8,940 | 1,360 | 6,800 | 8,160 | 1,190 | 5,950 | 7,140 | 950 | 4,750 | 5,700 |
| | | | *Vc* = 150 m/min, *fz* = 1 mm/t | | | | | | | | | | | | | | | | | | | | |
| 2,170 | 3,910 | 5,210 | 1,910 | 6,110 | 7,640 | 1,710 | 5,470 | 6,840 | 1,590 | 5,090 | 6,360 | 1,490 | 5,960 | 7,150 | 1,360 | 5,440 | 6,530 | 1,190 | 4,760 | 5,710 | 950 | 3,800 | 4,560 |
| | | | *Vc* = 150 m/min, *fz* = 0.8 mm/t | | | | | | | | | | | | | | | | | | | | |
| 580 | 700 | 930 | 510 | 1,020 | 1,280 | 450 | 900 | 1,130 | 420 | 840 | 1,050 | 400 | 1,000 | 1,200 | 360 | 900 | 1,080 | 320 | 800 | 960 | 250 | 630 | 1,000 |
| | | | *Vc* = 40 m/min, *fz* = 0.5 mm/t | | | | | | | | | | | | | | | | | | | | |
| 430 | 190 | 260 | 380 | 300 | 290 | 340 | 270 | 260 | 320 | 260 | 240 | 300 | 300 | 270 | 270 | 270 | 240 | 240 | 240 | 220 | 190 | 190 | 230 |
| | | | *Vc* = 30 m/min, *fz* = 0.2 mm/t | | | | | | | | | | | | | | | | | | | | |
| 1,450 | 650 | 870 | 1,270 | 1,020 | 1,270 | 1,140 | 910 | 1,140 | 1,060 | 850 | 1,060 | 990 | 990 | 1,190 | 910 | 910 | 1,090 | 800 | 800 | 960 | 640 | 640 | 1,020 |
| | | | *Vc* = 100 m/min, *fz* = 0.2 mm/t | | | | | | | | | | | | | | | | | | | | |
| 870 | 100 | 140 | 760 | 150 | 190 | 680 | 140 | 170 | 640 | 130 | 160 | 600 | 150 | 180 | 550 | 140 | 170 | 480 | 120 | 140 | 380 | 100 | 150 |
| | | | *Vc* = 60 m/min, *fz* = 0.05 mm/t | | | | | | | | | | | | | | | | | | | | |

The above table shows the conditions for standard shank type cutters. When using long shank type cutters, the number of teeth may be different. In this case, the cutting conditions should be changed by referring to: “The usage of standard and long shanks” shown in previous page.

Cutting conditions are generally limited by the rigidity and power of the machine and the rigidity of the workpiece. When setting the conditions, start from half of the values of the standard cutting conditions and then increase the value gradually while making sure the machine is running normally.



## APPLICATION RANGE




| Designation | Tool dia. ø*Dc* | Max. depth of cut Max *ap* | Max. ramping angle *θ*° | Max. plunging depth A | Max. cutting width in plunging *W* | Min.machinable hole dia. ø*D1* | Max.machinable hole dia. ø*D2* | Max. cutting width in enlarged hole *ae* |
|---|---|---|---|---|---|---|---|---|
| E/HXN03R016M... | ø16 | 1 | 2.1 | 0.3 | 3.5 | 22 | 30 | 12.5 |
| E/HXN03R018M... | ø18 | 1 | 1.7 | 0.3 | 3.5 | 26 | 34 | 14.5 |
| E/HXN03R020M... | ø20 | 1 | 1.4 | 0.3 | 3.5 | 30 | 38 | 16.5 |
| E/HXN03R022M... | ø22 | 1 | 1.2 | 0.3 | 3.5 | 34 | 42 | 18.5 |
| E/HXN03R025M... | ø25 | 1 | 1.0 | 0.3 | 3.5 | 40 | 48 | 21.5 |
| E/HXN03R028M... | ø28 | 1 | 0.8 | 0.3 | 3.5 | 46 | 54 | 24.5 |
| E/HXN03R030M... | ø30 | 1 | 0.7 | 0.3 | 3.5 | 50 | 58 | 26.5 |
| E/HXN03R032M... | ø32 | 1 | 0.7 | 0.3 | 3.5 | 54 | 62 | 28.5 |
| EXN03R035M... | ø35 | 1 | 0.6 | 0.3 | 3.5 | 60 | 68 | 31.5 |
| TXN03R040M... | ø40 | 1 | 0.5 | 0.3 | 3.5 | 70 | 78 | 36.5 |
| TXN03R050M... | ø50 | 1 | 0.4 | 0.3 | 3.5 | 90 | 98 | 46.5 |

· For ø*Dc* above 33 mm, slot milling, ramping or contouring is not recommended as chips may be re-cut.

# TXN06

## Super high feed milling cutters with double sided inserts with 4 edges

A.R. = +10°, R.R. = +2° ~ +6°



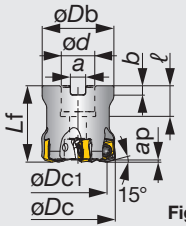



Fig.1

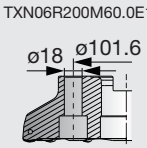



Fig.2



| Designation | Max. *ap* | ø*Dc* | z | ø*Dc1* | ø*Db* | *Lf* | ø*d* | *ℓ* | *a* | *b* | Kg | Air hole | Insert | Fig. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TXN06R050M22.0E04 | 1.5 | 50 | 4 | 37.6 | 47 | 50 | 22 | 20 | 10.4 | 6.3 | 0.4 | with | LN*U06... | 1 |
| TXN06R050M22.0E05 | 1.5 | 50 | 5 | 37.6 | 47 | 50 | 22 | 20 | 10.4 | 6.3 | 0.4 | with | LN*U06... | 1 |
| TXN06R052M22.0E04 | 1.5 | 52 | 4 | 39.6 | 49 | 50 | 22 | 20 | 10.4 | 6.3 | 0.5 | with | LN*U06... | 1 |
| TXN06R052M22.0E05 | 1.5 | 52 | 5 | 39.6 | 49 | 50 | 22 | 20 | 10.4 | 6.3 | 0.5 | with | LN*U06... | 1 |
| TXN06R063M22.0E04 | 1.5 | 63 | 4 | 50.6 | 59 | 50 | 22 | 20 | 10.4 | 6.3 | 0.8 | with | LN*U06... | 1 |
| TXN06R063M22.0E06 | 1.5 | 63 | 6 | 50.6 | 59 | 50 | 22 | 20 | 10.4 | 6.3 | 0.8 | with | LN*U06... | 1 |
| TXN06R066M27.0E04 | 1.5 | 66 | 4 | 53.6 | 63 | 50 | 27 | 22 | 12.4 | 7 | 0.8 | with | LN*U06... | 1 |
| TXN06R066M27.0E06 | 1.5 | 66 | 6 | 53.6 | 63 | 50 | 27 | 22 | 12.4 | 7 | 0.8 | with | LN*U06... | 1 |
| TXN06R080M27.0E05 | 1.5 | 80 | 5 | 67.6 | 76 | 63 | 27 | 22 | 12.4 | 7 | 1.6 | with | LN*U06... | 1 |
| TXN06R080M27.0E08 | 1.5 | 80 | 8 | 67.6 | 76 | 63 | 27 | 22 | 12.4 | 7 | 1.6 | with | LN*U06... | 1 |
| TXN06R100M32.0E06 | 1.5 | 100 | 6 | 87.6 | 96 | 63 | 32 | 25 | 14.4 | 8 | 2.2 | with | LN*U06... | 1 |
| TXN06R125M40.0E08 | 1.5 | 125 | 8 | 112.6 | 100 | 63 | 40 | 37 | 16.4 | 9 | 3 | with | LN*U06... | 1 |
| TXN06R160M40.0E10 | 1.5 | 160 | 10 | 147.6 | 100 | 63 | 40 | 37 | 16.4 | 9 | 5 | with | LN*U06... | 1 |
| TXN06R200M60.0E12 | 1.5 | 200 | 12 | 187.6 | 130 | 63 | 60 | 38 | 25.7 | 14 | 7.2 | without | LN*U06... | 2 |

### SPARE PARTS







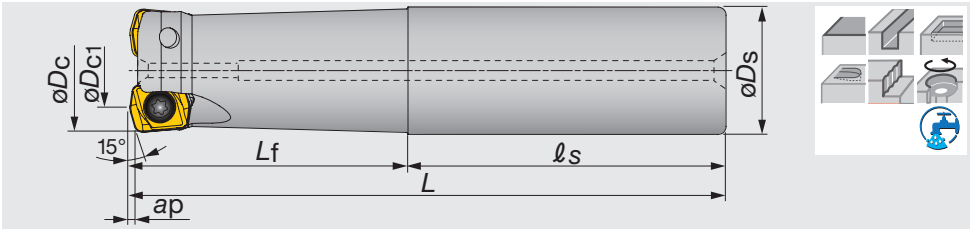

| Designation | Clamping screw | Grip | Lubricant | Shell locking bolt | Shell locking bolt 1 | Torx bit |
|---|---|---|---|---|---|---|
| TXN06R050M22.0... | CSPB-5 | H-TB2W | M-1000 | - | FSHM10-40H | BLDIP20/S7 |
| TXN06R052M22.0... | CSPB-5 | H-TB2W | M-1000 | - | FSHM10-40H | BLDIP20/S7 |
| TXN06R063M... | CSPB-5 | H-TB2W | M-1000 | - | CM10X30H | BLDIP20/S7 |
| TXN06R066,080M27.0... | CSPB-5 | H-TB2W | M-1000 | - | CM12X30H | BLDIP20/S7 |
| TXN06R100M... | CSPB-5 | H-TB2W | M-1000 | - | CM16X40H | BLDIP20/S7 |
| TXN06R125M... | CSPB-5 | H-TB2W | M-1000 | TMBA-M20H | - | BLDIP20/S7 |
| TXN06R160M40.0... | CSPB-5 | H-TB2W | M-1000 | TMBA-M20H | - | BLDIP20/M7 |
| TXN06R200M60.0... | CSPB-5 | H-TB2W | M-1000 | - | - | BLDIP20/M7 |

# EXN06

Super high feed milling endmills with double sided inserts with 4 edges

A.R. = +10°, R.R. = -2° ~ +6°






| Designation | Max. ap | øDc | z | øDc1 | øDs | L | Lf | ℓs | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| EXN06R032M32.0-02 | 1.5 | 32 | 2 | 19.7 | 32 | 150 | 70 | 80 | 0.8 | with | LN*U06... |
| EXN06R032M32.0-02L | 1.5 | 32 | 2 | 19.7 | 32 | 200 | 120 | 80 | 1.1 | with | LN*U06... |
| EXN06R035M32.0-02 | 1.5 | 35 | 2 | 22.7 | 32 | 150 | 45 | 105 | 0.9 | with | LN*U06... |
| EXN06R035M32.0-02L | 1.5 | 35 | 2 | 22.7 | 32 | 200 | 45 | 155 | 1.2 | with | LN*U06... |
| EXN06R040M32.0-03 | 1.5 | 40 | 3 | 27.6 | 32 | 150 | 45 | 105 | 0.9 | with | LN*U06... |
| EXN06R040M32.0-03L | 1.5 | 40 | 3 | 27.6 | 32 | 220 | 45 | 175 | 1.3 | with | LN*U06... |

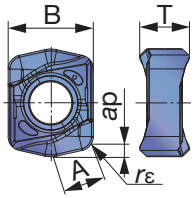
## SPARE PARTS

| Designation | Clamping screw | Lubricant | Wrench |
|---|---|---|---|
| EXN06 | CSPB-5 | M-1000 | IP-20D |

## INSERT

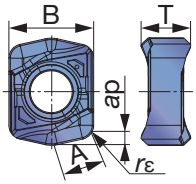
### LNMU06-MJ





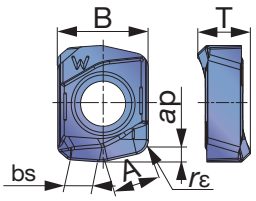

### LNMU06-ML






### LNGU06-W (2 cutting edges)






| | | | | | | |
|---|---|---|---|---|---|---|
| P | Steel | ☆ | | ★ | ★ | |
| M | Stainless | | ★ | ☆ | ☆ | |
| K | Cast iron | ★ | | ☆ | | |
| N | Non-ferrous | | | | | |
| S | Superalloys | ★ | ☆ | ★ | | |
| H | Hard materials | | | ★ | ★ | |

★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | Coating AH120 | AH130 | AH725 | AH3035 | A | B | T | bs |
|---|---|---|---|---|---|---|---|---|---|---|
| LNMU06X5ZER-MJ | 2 | 1.5 | ● | ● | ● | ● | 6 | 12 | 7 | - |
| LNMU06X5ZER-ML | 2 | 1.5 | ● | ● | ● | ● | 6 | 12 | 7 | - |
| LNGU06X5ZER-W | 2 | 1.5 | | | ● | | 6 | 12 | 7 | 3.6 |

●: Line-up

# STANDARD CUTTING CONDITIONS TXN06 / EXN06

| ISO | Workpiece material | Hardness | Priority | Grade | Chip-breaker | Cutting speed *Vc* (m/min) | Feed per tooth: *fz* (mm/t) Tool dia.: *øDc* (mm) ø32 ~ ø200 | Feed per tooth: *fz* (mm/t) Plunging | ø32, z = 2 *n* | ø32, z = 2 *Vf* | ø35, z = 2 *n* | ø35, z = 2 *Vf* | ø40, z = 3 *n* | ø40, z = 3 *Vf* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Carbon steel C45, C55, etc. | ~ 300HB | First choice | AH725 | MJ | 100 - 300 | 0.5 - 1.5 | 0.15 | 1,990 | 3,980 | 1,820 | 3,640 | 1,590 | 4,770 |
| | | | For wear resistance | AH120 | | | | | *Vc* = 200 m/min, *fz* = 1 mm/t | | | | | |
| | | | For impact resistance | AH3035 | | | | | | | | | | |
| | Alloy steel 42CrMo4, 17Cr3, etc. | ~ 300HB | First choice | AH725 | MJ | 100 - 200 | 0.5 - 1.5 | 0.15 | 1,490 | 2,980 | 1,360 | 2,720 | 1,190 | 3,570 |
| | | | For wear resistance | AH120 | | | | | *Vc* = 150 m/min, *fz* = 1 mm/t | | | | | |
| | | | For impact resistance | AH3035 | | | | | | | | | | |
| | Prehardened steel NAK80, PX5, etc. | 30 ~ 40HRC | - | AH3035 | ML | 100 - 200 | 0.5 - 1 | 0.15 | 1,490 | 2,380 | 1,360 | 2,180 | 1,190 | 2,860 |
| | | | | | | | | | *Vc* = 150 m/min, *fz* = 0.8 mm/t | | | | | |
| M | Stainless steel X5CrNi18-10, X5CrNiMo17-12-2, etc. | ~ 200HB | First choice | AH130 | ML | 100 - 150 | 0.3 - 0.7 | 0.1 | 1,190 | 1,190 | 1,090 | 1,090 | 950 | 1,430 |
| | | | | | | | | | *Vc* = 120 m/min, *fz* = 0.5 mm/t | | | | | |
| | | ~ 200HB | For impact resistance | AH130 | MJ | 100 - 150 | 0.3 - 0.8 | 0.1 | 1,190 | 1,430 | 1,090 | 1,310 | 950 | 1,710 |
| | | | | | | | | | *Vc* = 120 m/min, *fz* = 0.6 mm/t | | | | | |
| K | Grey cast iron GG25, GGG30, etc. | 150 ~ 250HB | First choice | AH120 | MJ | 100 - 300 | 0.5 - 1.5 | 0.15 | 1,990 | 3,980 | 1,820 | 3,640 | 1,590 | 4,770 |
| | | | | | | | | | *Vc* = 200 m/min, *fz* = 1 mm/t | | | | | |
| | | 150 ~ 250HB | For low cutting force | AH120 | ML | 100 - 300 | 0.5 - 1 | 0.15 | 1,990 | 3,180 | 1,820 | 2,910 | 1,590 | 3,820 |
| | | | | | | | | | *Vc* = 200 m/min, *fz* = 0.8 mm/t | | | | | |
| | Ductile cast iron GGG40, etc. | 150 ~ 250HB | First choice | AH120 | MJ | 80 - 200 | 0.5 - 1.5 | 0.15 | 1,490 | 2,980 | 1,360 | 2,720 | 1,190 | 3,570 |
| | | | | | | | | | *Vc* = 150 m/min, *fz* = 1 mm/t | | | | | |
| | | 150 ~ 250HB | For low cutting force | AH120 | ML | 80 - 200 | 0.5 - 1 | 0.15 | 1,490 | 2,380 | 1,360 | 2,180 | 1,190 | 2,860 |
| | | | | | | | | | *Vc* = 150 m/min, *fz* = 0.8 mm/t | | | | | |
| S | Titanium alloys Ti-6Al-4V, etc. | ~ 40HRC | - | AH725 | ML | 30 - 60 | 0.3 - 0.7 | 0.08 | 400 | 400 | 360 | 360 | 320 | 480 |
| | | | | | | | | | *Vc* = 40 m/min, *fz* = 0.5 mm/t | | | | | |
| | Heat-resistant alloys Inconel, Hastelloy, etc. | ~ 40HRC | - | AH725 | MJ | 20 - 50 | 0.1 - 0.3 | 0.05 | 300 | 120 | 270 | 110 | 240 | 140 |
| | | | | | | | | | *Vc* = 30 m/min, *fz* = 0.2 mm/t | | | | | |
| H | Hardened steel X40CrMoV5-1, etc. | 40 ~ 50HRC | First choice | AH3035 | MJ | 80 - 130 | 0.1 - 0.3 | 0.05 | 990 | 400 | 910 | 360 | 800 | 480 |
| | | | For wear resistance | AH725 | | | | | *Vc* = 100 m/min, *fz* = 0.2 mm/t | | | | | |
| | Hardened steel X153CrMoV12, etc. | 50 ~ 60HRC | First choice | AH725 | MJ | 50 - 70 | 0.03 - 0.07 | 0.03 | 600 | 60 | 550 | 60 | 480 | 70 |
| | | | For impact resistance | AH3035 | | | | | *Vc* = 60 m/min, *fz* = 0.05 mm/t | | | | | |

When chips stay in the cutting zone during slotting or pocketing, use air blast to remove chips from the work area.

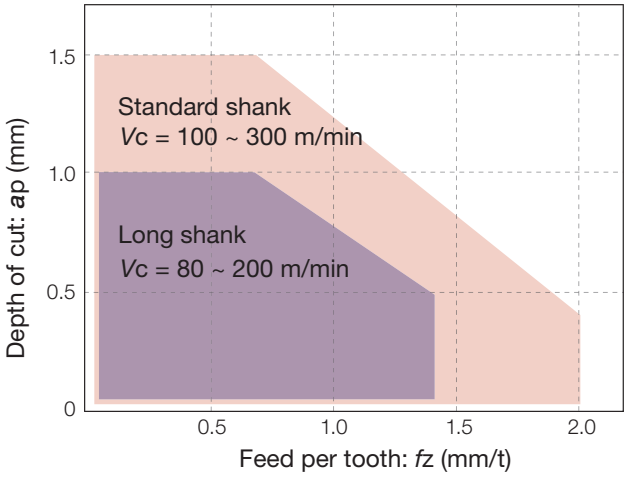
Tool overhang length must be as short as possible to avoid chatter. When the tool overhang length is long, decrease the number of revolutions and feed.



# CAUTIONARY POINTS IN USE

## The usage of a standard & long shank

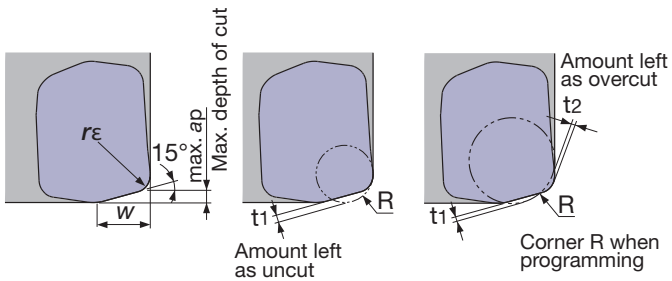
When using a long shank, please lower the cutting conditions (*Vc*, *fz*, *ap*) to 70% of the maximum conditions for the standard shank.




Tool dia.: *øDc* = ø32 ~ 40 mm
Workpiece material: C55 (200HB)
**L/D ratio of overhang**
Standard shank: L/D ≤ 3
Long shank: L/D = 4

## Tool geometry on program

When programming for CAM, the tool should be considered as a radius cutters. Usually, the corner radius should be set as R = 3 mm. If a larger radius is used, overcutting will occur. The following table shows the amount left as uncut ($t_1$) and overcut ($t_2$).




| Max. depth of cut max. ap(mm) | Corner radius *r*ε | *W* (mm) | Corner R when programming | Amount left as uncut $t_1$ | Amount left as overcut $t_2$ |
|---|---|---|---|---|---|
| 1.5 | 2 | 6 | 2 | 1 | - |
| | | | 3 | 0.77 | - |
| | | | 4 | 0.54 | 0.26 |

Each value in table is calculated theoretically at the maximum condition.

Tool dia.: ø*Dc* (mm), Number of revolutions: *n* (min$^{-1}$), Feed speed: *Vf* (mm/min), Max. depth of cut: *ap* = 1.5 mm, No. of inserts: z

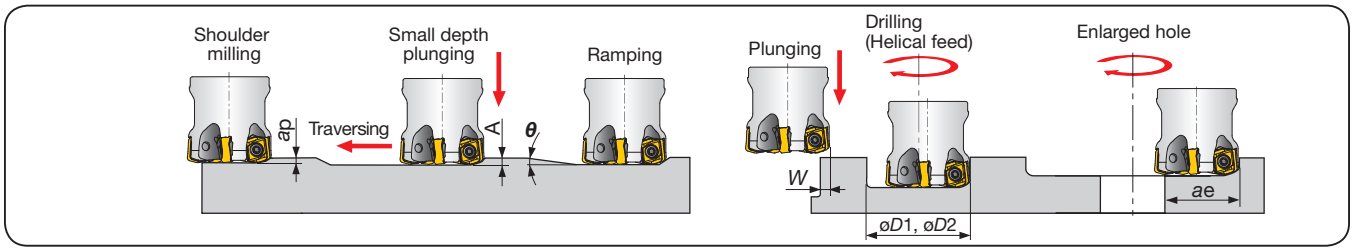
| ø50 | | | ø52 | | | ø63 | | | ø66 | | | ø80 | | | ø100, z = 6 | | ø125, z = 8 | | ø160, z = 10 | | ø200, z = 12 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *n* | *Vf* | | *n* | *Vf* | | *n* | *Vf* | | *n* | *Vf* | | *n* | *Vf* | | *n* | *Vf* | *n* | *Vf* | *n* | *Vf* | *n* | *Vf* |
| | z = 4 | z = 5 | | z = 4 | z = 5 | | z = 4 | z = 6 | | z = 4 | z = 6 | | z = 5 | z = 8 | | | | | | | | |
| 1,270 | 5,080 | 6,350 | 1,220 | 4,880 | 6,100 | 1,010 | 4,040 | 6,060 | 960 | 3,840 | 5,760 | 800 | 4,000 | 6,400 | 637 | 3,822 | 510 | 4,076 | 398 | 3,981 | 318 | 3,822 |
| *Vc* = 200 m/min, *fz* = 1 mm/t | | | | | | | | | | | | | | | | | | | | | | |
| 950 | 3,800 | 4,750 | 920 | 3,680 | 4,600 | 760 | 3,040 | 4,560 | 720 | 2,880 | 4,320 | 600 | 3,000 | 4,800 | 478 | 2,866 | 382 | 3,057 | 299 | 2,986 | 239 | 2,866 |
| *Vc* = 150 m/min, *fz* = 1 mm/t | | | | | | | | | | | | | | | | | | | | | | |
| 950 | 3,040 | 3,800 | 920 | 2,940 | 3,680 | 760 | 2,430 | 3,650 | 720 | 2,300 | 3,460 | 600 | 2,400 | 3,840 | 478 | 2,293 | 382 | 2,446 | 299 | 2,389 | 239 | 2,293 |
| *Vc* = 150 m/min, *fz* = 0.8 mm/t | | | | | | | | | | | | | | | | | | | | | | |
| 760 | 1,520 | 1,900 | 730 | 1,460 | 1,830 | 610 | 1,220 | 1,830 | 580 | 1,160 | 1,740 | 480 | 1,200 | 1,920 | 382 | 1,146 | 306 | 1,223 | 239 | 1,194 | 191 | 1,146 |
| *Vc* = 120 m/min, *fz* = 0.5 mm/t | | | | | | | | | | | | | | | | | | | | | | |
| 760 | 1,820 | 2,280 | 730 | 1,750 | 2,190 | 610 | 1,470 | 2,200 | 580 | 1,390 | 2,090 | 480 | 1,440 | 2,300 | 382 | 1,376 | 306 | 1,468 | 239 | 1,433 | 191 | 1,376 |
| *Vc* = 120 m/min, *fz* = 0.6 mm/t | | | | | | | | | | | | | | | | | | | | | | |
| 1,270 | 5,080 | 6,350 | 1,220 | 4,880 | 6,100 | 1,010 | 4,040 | 6,060 | 960 | 3,840 | 5,760 | 800 | 4,000 | 6,400 | 637 | 3,822 | 510 | 4,076 | 398 | 3,981 | 318 | 3,822 |
| *Vc* = 200 m/min, *fz* = 1 mm/t | | | | | | | | | | | | | | | | | | | | | | |
| 1,270 | 4,060 | 5,080 | 1,220 | 3,900 | 4,880 | 1,010 | 3,230 | 4,850 | 960 | 3,070 | 4,610 | 800 | 3,200 | 5,120 | 637 | 3,057 | 510 | 3,261 | 398 | 3,185 | 318 | 3,057 |
| *Vc* = 200 m/min, *fz* = 0.8 mm/t | | | | | | | | | | | | | | | | | | | | | | |
| 950 | 3,800 | 4,750 | 920 | 3,680 | 4,600 | 760 | 3,040 | 4,560 | 720 | 2,880 | 4,320 | 600 | 3,000 | 4,800 | 478 | 2,866 | 382 | 3,057 | 299 | 2,986 | 239 | 2,866 |
| *Vc* = 150 m/min, *fz* = 1 mm/t | | | | | | | | | | | | | | | | | | | | | | |
| 950 | 3,040 | 3,800 | 920 | 2,940 | 3,680 | 760 | 2,430 | 3,650 | 720 | 2,300 | 3,460 | 600 | 2,400 | 3,840 | 478 | 2,293 | 382 | 2,446 | 299 | 2,389 | 239 | 2,293 |
| *Vc* = 150 m/min, *fz* = 0.8 mm/t | | | | | | | | | | | | | | | | | | | | | | |
| 250 | 500 | 630 | 240 | 480 | 600 | 200 | 400 | 600 | 190 | 380 | 570 | 160 | 400 | 640 | 127 | 382 | 102 | 408 | 80 | 398 | 64 | 382 |
| *Vc* = 40 m/min, *fz* = 0.5 mm/t | | | | | | | | | | | | | | | | | | | | | | |
| 190 | 150 | 190 | 180 | 140 | 180 | 150 | 120 | 180 | 140 | 110 | 170 | 120 | 120 | 190 | 96 | 115 | 76 | 122 | 60 | 119 | 48 | 115 |
| *Vc* = 30 m/min, *fz* = 0.2 mm/t | | | | | | | | | | | | | | | | | | | | | | |
| 640 | 510 | 640 | 610 | 490 | 610 | 510 | 410 | 610 | 480 | 380 | 580 | 400 | 400 | 640 | 318 | 382 | 255 | 408 | 199 | 398 | 159 | 382 |
| *Vc* = 100 m/min, *fz* = 0.2 mm/t | | | | | | | | | | | | | | | | | | | | | | |
| 380 | 80 | 100 | 370 | 75 | 90 | 300 | 60 | 90 | 290 | 60 | 85 | 240 | 60 | 100 | 191 | 57 | 153 | 61 | 119 | 60 | 96 | 57 |
| *Vc* = 60 m/min, *fz* = 0.05 mm/t | | | | | | | | | | | | | | | | | | | | | | |

The above table shows the conditions for standard shank type cutters. When using long shank type cutters, the number of teeth may be different. In this case, the cutting conditions should be changed by referring to: “The usage of standard and long shanks” shown in previous page.

Cutting conditions are generally limited by the rigidity and power of the machine and the rigidity of the workpiece. When setting the conditions, start from half of the values of the standard cutting conditions and then increase the value gradually while making sure the machine is running normally.



## APPLICATION RANGE




| Designation | Tool dia. ø*Dc* | Max. depth of cut Max. *ap* | Max. ramping angle *θ*° | Max. plunging depth A | Max. cutting width in plunging *W* | Min.machinable hole dia. ø*D1* | Max.machinable hole dia. ø*D2* | Max. cutting width in enlarged hole *ae* |
|---|---|---|---|---|---|---|---|---|
| EXN06R032M... | ø32 | 1.5 | 2 | 0.5 | 6 | 47 | 59 | 25 |
| EXN06R035M... | ø35 | 1.5 | 1.7 | 0.5 | 6 | 53 | 65 | 28 |
| EXN06R040M... | ø40 | 1.5 | 1.3 | 0.5 | 6 | 63 | 75 | 33 |
| TXN06R050M... | ø50 | 1.5 | 0.9 | 0.5 | 6 | 83 | 95 | 43 |
| TXN06R052M... | ø52 | 1.5 | 0.8 | 0.5 | 6 | 87 | 99 | 45 |
| TXN06R063M... | ø63 | 1.5 | 0.6 | 0.5 | 6 | 109 | 121 | 56 |
| TXN06R066M... | ø66 | 1.5 | 0.5 | 0.5 | 6 | 115 | 127 | 59 |
| TXN06R080M... | ø80 | 1.5 | 0.5 | 0.5 | 6 | 143 | 155 | 73 |
| TXN06R100M... | ø100 | 1.5 | 0.34 | 0.5 | 6 | 183 | 195 | 93 |
| TXN06R125M... | ø120 | 1.5 | 0.26 | 0.5 | 6 | 223 | 235 | 108 |
| TXN06R160M... | ø160 | 1.5 | 0.2 | 0.5 | 6 | 303 | 315 | 153 |
| TXN06R200M... | ø200 | 1.5 | 0.15 | 0.5 | 6 | 383 | 395 | 193 |

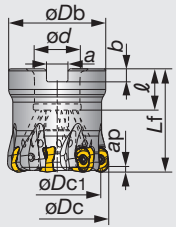
· For ø*Dc* above 100 mm, slot milling, ramping or contouring is not recommended as chips may be re-cut.

## DOTWIST BALL
## TXLN

Radius cutter with double-sided insert with 4 edges

A.R. = +3°, R.R. = -13°








| Designation | Max. ap | øDc | z | øDc1 | øDb | Lf | ød | ℓ | a | b | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TXLN04M040B16.0R06 | 4 | 40 | 6 | 32 | 35 | 40 | 16 | 18 | 8.4 | 5.6 | 0.35 | with | LNMX04... |
| TXLN04M050B22.0R07 | 4 | 50 | 7 | 42 | 47 | 50 | 22 | 20 | 10.4 | 6.3 | 0.45 | with | LNMX04... |

### SPARE PARTS







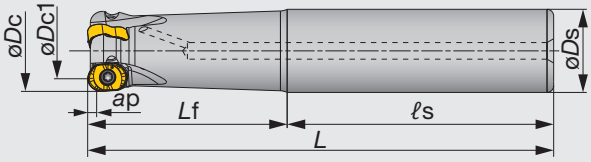
| Designation | Clamping screw | Grip | Lubricant | Shell locking bolt | Torx bit |
|---|---|---|---|---|---|
| TXLN04M040B16.0R06 | CSPD-3 | SW6-SD | M-1000 | FSHM8-30H | BLD IP10/S7 |
| TXLN04M050B22.0R07 | CSPD-3 | SW6-SD | M-1000 | CM10X30H | BLD IP10/S7 |

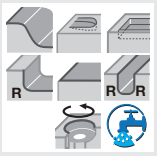
## DOTWIST BALL
## EXLN

Radius cutter with double-sided insert with 4 edges

A.R. = +3°, R.R. = -12° ~ -14°





| Designation | Max. ap | øDc | z | øDc1 | øDs | ℓs | Lf | L | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| EXLN04M020C20.0R02 | 4 | 20 | 2 | 12 | 20 | 80 | 50 | 130 | 0.28 | with | LNMX04... |
| EXLN04M025C25.0R03 | 4 | 25 | 3 | 17 | 25 | 80 | 60 | 140 | 0.46 | with | LNMX04... |
| EXLN04M032C32.0R04 | 4 | 32 | 4 | 24 | 32 | 80 | 70 | 150 | 0.83 | with | LNMX04... |
| EXLN04M032C32.0R05 | 4 | 32 | 5 | 24 | 32 | 80 | 70 | 150 | 0.83 | with | LNMX04... |

### SPARE PARTS



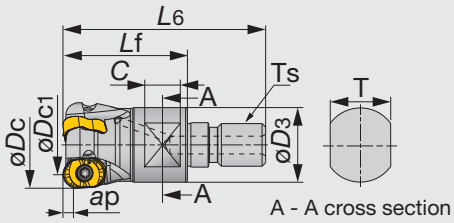

| Designation | Clamping screw | Mono block type wrench |
|---|---|---|
| EXLN04... | CSPD-3 | IP-10D |

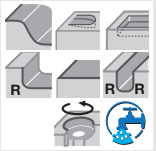
# HXLN04-M

Radius cutter with double-sided insert with 4 edges, Modular head with metric threaded adaptation

A.R. = +3°, R.R. = -12° ~ -14°





| Designation | Max. ap | øDc | z | øDc1 | L6 | Lf | C | T | øD3 | Ts | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HXLN04M020M10R02 | 4 | 20 | 2 | 12 | 49 | 30 | 10 | 15 | 18 | M10 | 0.07 | with | LNMX04... |
| HXLN04M025M12R03 | 4 | 25 | 3 | 17 | 57 | 35 | 10 | 17 | 21 | M12 | 0.16 | with | LNMX04... |
| HXLN04M032M16R04 | 4 | 32 | 4 | 24 | 63 | 40 | 12 | 22 | 29 | M16 | 0.2 | with | LNMX04... |

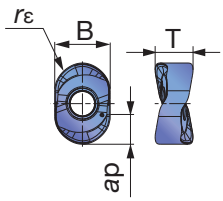
**SPARE PARTS**

| Designation | Clamping screw | Lubricant | Wrench |
|---|---|---|---|
| HXLN04... | CSPD-3 | M-1000 | IP-10D |

## INSERT

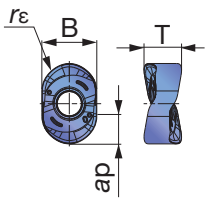
### LNMX-MJ





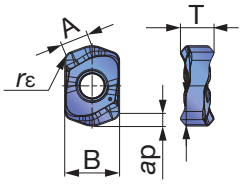

### LNMX-ML






### LNMX-HJ






| | | | |
|---|---|---|---|
| P | Steel | ☆ | ★ |
| M | Stainless | | ★ |
| K | Cast iron | ★ | |
| N | Non-ferrous | | |
| S | Superalloys | ★ | ☆ |
| H | Hard materials | ★ | ★ |

★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | Coating AH120 | Coating AH3135 | A | B | T |
|---|---|---|---|---|---|---|---|
| LNMX0405R4-MJ | 4 | 4 | ● | ● | - | 8.2 | 5.6 |
| LNMX0405R4-ML | 4 | 4 | ● | ● | - | 8.2 | 5.6 |
| LNMX0405ZER-HJ | 1.3 | 1.3 | ● | ● | 4.3 | 8.2 | 5 |

●: Line-up

# STANDARD CUTTING CONDITIONS

For MJ, ML type

| ISO | Workpiece material | | Hardness | Priority | Grade | Chip-breaker | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) |
|---|---|---|---|---|---|---|---|---|
| P | Low carbon steels C15, C20, etc. | | - 300 HB | First choice | AH3135 | MJ | 150 - 250 | 0.2 - 0.6 |
| | | | - 300 HB | Second choice | AH3135 | ML | 150 - 250 | 0.2 - 0.6 |
| | Carbon steels, Alloy steels C55, 42CrMoS4, etc. | | - 300 HB | First choice | AH3135 | MJ | 150 - 250 | 0.2 - 0.6 |
| | | | - 300 HB | Second choice | AH3135 | ML | 150 - 250 | 0.2 - 0.6 |
| | Prehardened steels NAK80, PX5, etc. | | 30 - 40 HRC | First choice | AH3135 | MJ | 100 - 200 | 0.15 - 0.4 |
| | | | 30 - 40 HRC | Second choice | AH3135 | ML | 100 - 200 | 0.15 - 0.4 |
| M | Stainless steels X5CrNi18-9, X5CrNiMo17-12-2, etc | | - 200 HB | First choice | AH3135 | MJ | 100 - 200 | 0.2 - 0.6 |
| | | | - 200 HB | Second choice | AH3135 | ML | 100 - 200 | 0.2 - 0.6 |
| | Stainless steels X12Cr113, X20Cr13, etc | | - 200 HB | First choice | AH3135 | MJ | 100 - 300 | 0.2 - 0.6 |
| | | | - 200 HB | Second choice | AH3135 | ML | 100 - 300 | 0.2 - 0.6 |
| K | Grey cast irons 250, 300, etc. | | 150 - 250 HB | First choice | AH120 | MJ | 150 - 250 | 0.2 - 0.6 |
| | | | 150 - 250 HB | Second choice | AH120 | ML | 150 - 250 | 0.2 - 0.6 |
| | Ductile cast irons 400-15, 600-3, etc. | | 150 - 250 HB | First choice | AH120 | MJ | 150 - 250 | 0.2 - 0.6 |
| | | | 150 - 250 HB | Second choice | AH120 | ML | 150 - 250 | 0.2 - 0.6 |
| H | Hardened steel | X40CrMoV5-1, etc | 40 - 50 HRC | First choice | AH3135 | MJ | 50 - 150 | 0.1 - 0.3 |
| | | | 40 - 50 HRC | Second choice | AH3135 | ML | 50 - 150 | 0.1 - 0.3 |
| | | X153CrMoV12, etc | 50 - 60 HRC | First choice | AH120 | MJ | 50 - 70 | 0.05 - 0.15 |
| | | | 50 - 60 HRC | Second choice | AH120 | ML | 50 - 70 | 0.05 - 0.15 |

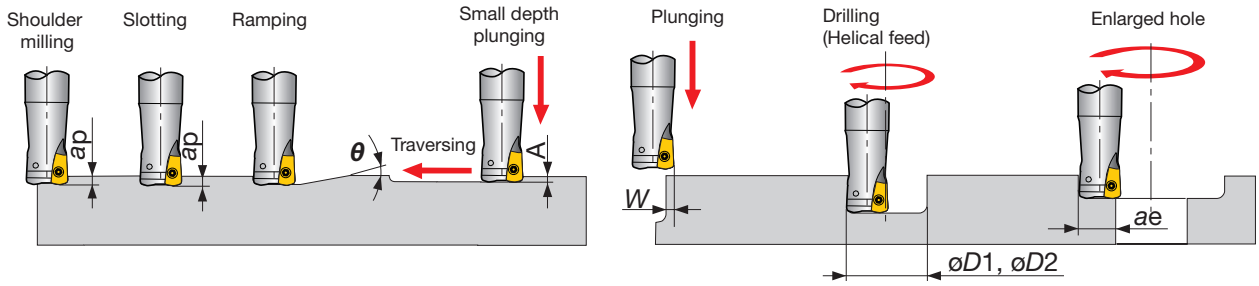


For HJ type

| ISO | Workpiece material | | Hardness | Priority | Grade | Chipbreaker | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) |
|---|---|---|---|---|---|---|---|---|
| P | Low carbon steels C15, C20, etc. | | - 300 HB | First choice | AH3135 | HJ | 150 - 250 | 0.5 - 1.3 |
| | | | | Second choice | AH120 | HJ | 150 - 250 | 0.5 - 1.3 |
| | Carbon steels, Alloy steels C55, 42CrMoS4, etc. | | - 300 HB | First choice | AH3135 | HJ | 150 - 250 | 0.5 - 1.3 |
| | | | | Second choice | AH120 | HJ | 150 - 250 | 0.5 - 1.3 |
| | Prehardened steels NAK80, PX5, etc. | | 30 - 40 HRC | First choice | AH3135 | HJ | 100 - 200 | 0.3 - 0.7 |
| | | | | Second choice | AH120 | HJ | 100 - 200 | 0.3 - 0.7 |
| M | Stainless steels X5CrNi18-9, X5CrNiMo17-12-2, etc | | - 200 HB | First choice | AH3135 | HJ | 100 - 200 | 0.3 - 0.7 |
| | | | - 200 HB | First choice | AH3135 | HJ | 100 - 300 | 0.3 - 0.7 |
| K | Grey cast irons 250, 300, etc. | | 150 - 250 HB | First choice | AH120 | HJ | 150 - 250 | 0.5 - 1.3 |
| | Ductile cast irons 400-15, 600-3, etc. | | 150 - 250 HB | First choice | AH120 | HJ | 150 - 250 | 0.5 - 1.3 |
| H | Hardened steel | X40CrMoV5-1, etc | 40 - 50 HRC | First choice | AH3135 | HJ | 50 - 150 | 0.1 - 0.5 |
| | | | | Second choice | AH120 | HJ | 50 - 150 | 0.1 - 0.5 |
| | | X153CrMoV12, etc | 50 - 60 HRC | First choice | AH120 | HJ | 50 - 70 | 0.05 - 0.2 |

Note: Recommended cutting conditions are just for reference in general machining.

## APPLICATION RANGE




For MJ, ML type

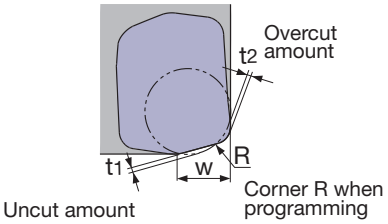
| Designation | Tool dia. øDc | øDc1 | Max. depth of cut ap | Max. ramping angle θ° | Max. plunging depth A | Max. cutting width in plunging W | Min. machining øD1 | Max. machining øD2 | Max. cutting width in enlarging ae |
|---|---|---|---|---|---|---|---|---|---|
| EXLN04M020C20.0R02 | 20 | 12 | 4 | 4.7 | 0.8 | 4 | 28 | 38 | 15 |
| EXLN04M025C25.0R03 | 25 | 17 | 4 | 3 | 0.8 | 4 | 38 | 48 | 20 |
| EXLN04M032C32.0R04 | 32 | 24 | 4 | 2 | 0.8 | 4 | 50 | 62 | 27 |
| EXLN04M032C32.0R05 | 32 | 24 | 4 | 1.7 | 0.7 | 4 | 50 | 62 | 27 |
| TXLN04M040B16.0R06 | 40 | 32 | 4 | 1.3 | 0.7 | 4 | 68 | 78 | 36 |
| TXLN04M050B22.0R07 | 50 | 42 | 4 | 1 | 0.7 | 4 | 88 | 98 | 46 |
| HXLN04M020M10R02 | 20 | 12 | 4 | 4.7 | 0.8 | 4 | 28 | 38 | 15 |
| HXLN04M025M12R03 | 25 | 17 | 4 | 3 | 0.8 | 4 | 38 | 48 | 20 |
| HXLN04M032M16R04 | 32 | 24 | 4 | 2 | 0.8 | 4 | 50 | 62 | 27 |

For HJ type

| Designation | Tool dia. øDc | øDc1 | Max. depth of cut ap | Max. ramping angle θ° | Max. plunging depth A | Max. cutting width in plunging W | Min. machining øD1 | Max. machining øD2 | Max. cutting width in enlarging ae |
|---|---|---|---|---|---|---|---|---|---|
| EXLN04M020C20.0R02 | 20 | 12 | 1.3 | 4.9 | 0.75 | 4.1 | 27 | 38 | 15.5 |
| EXLN04M025C25.0R03 | 25 | 17 | 1.3 | 3 | 0.75 | 4.1 | 37 | 48 | 20.5 |
| EXLN04M032C32.0R04 | 32 | 24 | 1.3 | 2 | 0.75 | 4.1 | 51 | 62 | 27.5 |
| EXLN04M032C32.0R05 | 32 | 24 | 1.3 | 2 | 0.75 | 4.1 | 51 | 62 | 27.5 |
| TXLN04M040B16.0R06 | 40 | 32 | 1.3 | 1.4 | 0.75 | 4.1 | 67 | 78 | 35.5 |
| TXLN04M050B22.0R07 | 50 | 42 | 1.3 | 1 | 0.75 | 4.1 | 87 | 98 | 45.5 |
| HXLN04M020M10R02 | 20 | 12 | 1.3 | 4.9 | 0.75 | 4.1 | 27 | 38 | 15.5 |
| HXLN04M025M12R03 | 25 | 17 | 1.3 | 3 | 0.75 | 4.1 | 37 | 48 | 20.5 |
| HXLN04M032M16R04 | 32 | 24 | 1.3 | 2 | 0.75 | 4.1 | 51 | 62 | 27.5 |



## TOOL GEOMETRY ON PROGRAM




| Max. depth of cut max. ap (mm) | W (mm) | Programmed corner R (mm) | Amount left uncut t1 (mm) | Amount left overcut t2 (mm) |
|---|---|---|---|---|
| 1.3 | 4.1 | R1.5 | 0.8 | 0 |
| 1.3 | 4.1 | R2.0 | 0.65 | 0 |
| 1.3 | 4.1 | R2.5 | 0.5 | 0.05 |
| 1.3 | 4.1 | R3.0 | 0.36 | 0.2 |

MEMO

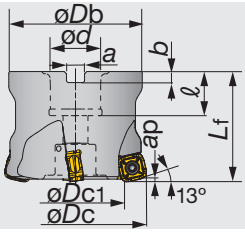
# DOFEEDQUAD

## TXQ

High feed cutter for face milling

A.R. = +7°, R.R. = -8° ~ -4.5°






| Designation | Max. ap | øDc | z | øDc1 | øDb | Lf | ød | ℓ | a | b | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TXQ12R050M22.0E03 | 2 | 50 | 3 | 33.8 | 47 | 50 | 22 | 20 | 10.4 | 6.3 | 0.4 | with | SQMU1206ZSR-MJ |
| TXQ12R052M22.0E03 | 2 | 52 | 3 | 35.8 | 49 | 50 | 22 | 20 | 10.4 | 6.3 | 0.5 | with | SQMU1206ZSR-MJ |
| TXQ12R063M22.0E04 | 2 | 63 | 4 | 46.8 | 59 | 50 | 22 | 20 | 10.4 | 6.3 | 0.8 | with | SQMU1206ZSR-MJ |
| TXQ12R066M27.0E04 | 2 | 66 | 4 | 49.8 | 63 | 50 | 27 | 22 | 12.4 | 7 | 0.9 | with | SQMU1206ZSR-MJ |
| TXQ12R080M27.0E05 | 2 | 80 | 5 | 63.8 | 76 | 63 | 27 | 22 | 12.4 | 7 | 1.6 | with | SQMU1206ZSR-MJ |
| TXQ12R100M32.0E06 | 2 | 100 | 6 | 83.8 | 96 | 63 | 32 | 25 | 14.4 | 8 | 3 | with | SQMU1206ZSR-MJ |
| TXQ12R125M40.0E07 | 2 | 125 | 7 | 108.8 | 98 | 63 | 40 | 32 | 16.4 | 9 | 3.2 | with | SQMU1206ZSR-MJ |

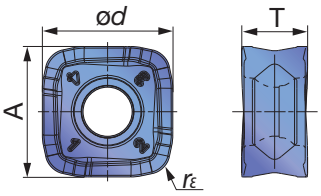
### SPARE PARTS

| Designation | Clamping screw | Grip | Lubricant | Shell locking bolt | Shell locking bolt 1 | Torx bit |
|---|---|---|---|---|---|---|
| TXQ12R050, 052M22.0... | CSPB-4 | H-TBS | M-1000 | - | FSHM10-40H | BLDIP15/S7 |
| TXQ12R063M22.0E04 | CSPB-4 | H-TBS | M-1000 | - | CM10X30H | BLDIP15/S7 |
| TXQ12R066, 080M27.0... | CSPB-4 | H-TBS | M-1000 | - | CM12X30H | BLDIP15/S7 |
| TXQ12R100M32.0E06 | CSPB-4 | H-TBS | M-1000 | - | CM16X40H | BLDIP15/S7 |
| TXQ12R125M40.0E07 | CSPB-4 | H-TBS | M-1000 | TMBA-M20H | - | BLDIP15/S7 |

## INSERT

### SQMU-MJ






| | | | | | | | |
|---|---|---|---|---|---|---|---|
| P | Steel | ☆ | | ★ | ☆ | | |
| M | Stainless | | ★ | ☆ | | | |
| K | Cast iron | ★ | | ☆ | | | |
| N | Non-ferrous | | | | | | |
| S | Superalloys | ★ | ☆ | ★ | | | |
| H | Hard materials | | | ★ | | | |

★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | Coating AH120 | AH130 | AH725 | T3130 | A | T | ød |
|---|---|---|---|---|---|---|---|---|---|
| SQMU1206ZSR-MJ | 2 | 2 | ● | ● | ● | ● | 11.7 | 6 | 11.7 |

●: Line-up

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Hardness | Priority | Grade | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) |
|---|---|---|---|---|---|---|
| P | High carbon steels C45, etc. | ~ 300HB | First choice | AH725 | 100 - 300 | 0.5 - 2 |
| | | | For wear resistance | T3130 | 100 - 300 | 0.5 - 2 |
| | | | For impact resistance | AH130 | 100 - 300 | 0.5 - 2 |
| | Alloyed steels 42CrMo4, etc. | ~ 300HB | First choice | AH725 | 100 - 200 | 0.5 - 1.5 |
| | | | For wear resistance | T3130 | 100 - 200 | 0.5 - 1.5 |
| | | | For impact resistance | AH130 | 100 - 200 | 0.5 - 1.5 |
| | Prehardened steels PX5, NAK80, etc. | 30 ~ 40HRC | - | AH725 | 100 - 200 | 0.5 - 1 |
| M | Stainless steel X5CrNi18-9, etc. | ~ 200HB | - | AH130 | 100 - 150 | 0.3 - 0.8 |
| K | Grey cast iron 250, etc. | - | - | AH120 | 100 - 300 | 0.5 - 2 |
| | Ductile cast irons 600-3, etc. | - | - | AH120 | 80 - 200 | 0.5 - 2 |
| S | Titanium alloy Ti-6Al-4V, etc. | ~ 40HRC | - | AH725 | 30 - 60 | 0.3 - 0.7 |
| H | Hardened steels X40CrMoV5-1, etc. | 40 ~ 50HRC | - | AH725 | 80 - 130 | 0.1 - 0.3 |
| | | 50 ~ 60HRC | - | AH725 | 50 - 70 | 0.03 - 0.07 |

· Slot or pocket milling is not recommended, since the chip re-cutting easily occurs.
· Tool overhang length must be as short as possible to avoid chatter. When the tool overhang length is long, decrease the number of revolutions and feed.

· Cutting conditions are generally limited by the rigidity and power of the machine and the rigidity of the workpiece. When setting the conditions, start from half of the values of the standard cutting conditions and then increase the value gradually while making sure the machine is running normally.

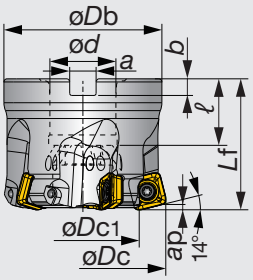
**Tool dia.: ø*D*c (mm), Number of revolutions: *n* (min$^{-1}$), Feed speed: *V*f (mm/min), Max. depth of cut: *a*p = 2 mm**

| ø50 | | ø63 | | ø80 | | ø100 | | ø125 | |
|---|---|---|---|---|---|---|---|---|---|
| ***n*** | ***V*f** | ***n*** | ***V*f** | ***n*** | ***V*f** | ***n*** | ***V*f** | ***n*** | ***V*f** |
| 1,270 | 4,570 | 1,010 | 4,850 | 790 | 4,740 | 630 | 4,540 | 500 | 4,200 |
| | | | | *V*c = 200 m/min, *f*z = 1.2 mm/t | | | | | |
| 950 | 2,850 | 750 | 3,000 | 590 | 2,950 | 470 | 2,820 | 380 | 2,660 |
| | | | | *V*c = 150 m/min, *f*z = 1.0 mm/t | | | | | |
| 950 | 2,280 | 750 | 2,400 | 590 | 2,360 | 470 | 2,260 | 380 | 2,130 |
| | | | | *V*c = 150 m/min, *f*z = 0.8 mm/t | | | | | |
| 760 | 1,140 | 600 | 1,200 | 470 | 1,180 | 380 | 1,140 | 300 | 1,050 |
| | | | | *V*c = 120 m/min, *f*z = 0.5 mm/t | | | | | |
| 1,270 | 4,570 | 1,010 | 4,850 | 790 | 4,740 | 630 | 4,540 | 500 | 4,200 |
| | | | | *V*c = 200 m/min, *f*z = 1.2 mm/t | | | | | |
| 950 | 3,420 | 750 | 3,600 | 590 | 3,540 | 470 | 3,380 | 380 | 3,190 |
| | | | | *V*c = 150 m/min, *f*z = 1.2 mm/t | | | | | |
| 250 | 370 | 200 | 400 | 150 | 380 | 120 | 360 | 100 | 350 |
| | | | | *V*c = 40 m/min, *f*z = 0.5 mm/t | | | | | |
| 630 | 380 | 500 | 400 | 390 | 390 | 310 | 370 | 250 | 350 |
| | | | | *V*c = 100 m/min, *f*z = 0.2 mm/t | | | | | |
| 380 | 60 | 300 | 60 | 235 | 60 | 190 | 60 | 150 | 50 |
| | | | | *V*c = 60 m/min, *f*z = 0.05 mm/t | | | | | |

## Super high-feed miling cutter with large depth of cut; Bore type

A.R. = +5°, R.R. = 0°






| Designation | Max. ap | øDc | z | øDc1 | øDb | Lf | ød | ℓ | a | b | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TXSW15M050B22.0R03 | 2.5 | 50 | 3 | 24.1 | 47 | 50 | 22 | 20 | 10.4 | 6.3 | 0.4 | with | SWMT15... |
| TXSW15M063B22.0R04 | 2.5 | 63 | 4 | 37.1 | 59 | 50 | 22 | 20 | 10.4 | 6.3 | 0.66 | with | SWMT15... |
| TXSW15M080B27.0R05 | 2.5 | 80 | 5 | 54.1 | 76 | 63 | 27 | 22 | 12.4 | 7 | 1.41 | with | SWMT15... |
| TXSW15M100B32.0R06 | 2.5 | 100 | 6 | 74.1 | 96 | 63 | 32 | 25 | 14.4 | 8 | 2.26 | with | SWMT15... |
| TXSW15M125B40.0R07 | 2.5 | 125 | 7 | 99.1 | 100 | 63 | 40 | 32 | 16.4 | 9 | 2.83 | with | SWMT15... |
| TXSW15M160B40.0R08 | 2.5 | 160 | 8 | 134.1 | 100 | 63 | 40 | 32 | 16.4 | 9 | 4.23 | with | SWMT15... |

### SPARE PARTS

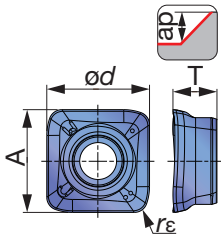
| Designation | Clamping screw | Grip | Lubricant | Shell locking bolt | Shell locking bolt 1 | Torx bit |
|---|---|---|---|---|---|---|
| TXSW15M050B22.0R03 | TS50115I | H-TB2W | M-1000 | - | SR PS 118-0273 | BT20S |
| TXSW15M063B22.0R04 | TS50115I | H-TB2W | M-1000 | - | FSHM10-40H | BT20S |
| TXSW15M080B27.0R05 | TS50115I | H-TB2W | M-1000 | - | CM12X30H | BT20S |
| TXSW15M100B32.0R06 | TS50115I | H-TB2W | M-1000 | - | CM16X40H | BT20S |
| TXSW15M125B40.0R07 | TS50115I | H-TB2W | M-1000 | TMBA-M20H | - | BT20M |
| TXSW15M160B40.0R08 | TS50115I | H-TB2W | M-1000 | TMBA-M20H | - | BT20M |



## INSERT

### SWMT-MJ






| | | | |
|---|---|---|---|
| P | Steel | ☆ | ★ |
| M | Stainless | | ★ |
| K | Cast iron | ★ | |
| N | Non-ferrous | | |
| S | Superalloys | ★ | ☆ |
| H | Hard materials | ★ | ★ |

★ : First choice
☆ : Second choice

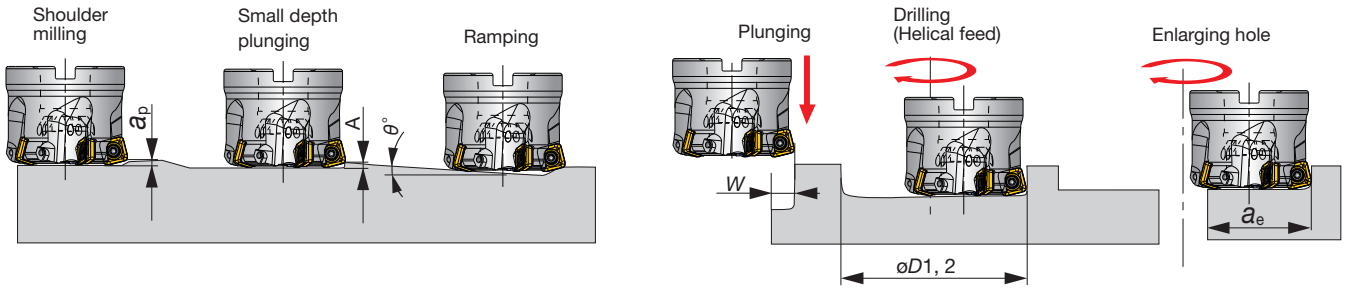
| Designation | rε | Max. ap | Coating AH120 | Coating AH3135 | A | ød | T |
|---|---|---|---|---|---|---|---|
| SWMT1506ZER-MJ | 2 | 2.5 | ● | ● | 15.9 | 15.9 | 6.8 |

●: Line-up

## STANDARD CUTTING CONDITIONS

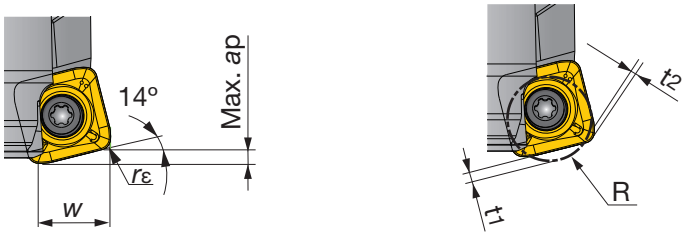
| ISO | Workpiece material | | Hardness | Priority | Grade | Chip-breaker | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) |
|---|---|---|---|---|---|---|---|---|
| P | Low carbon steel C15E4, E275A, etc. | | - 300 HB | First choice | AH3135 | MJ | 100 - 300 | 0.5 - 2 |
| | | | - 300 HB | Second choice | AH120 | MJ | 100 - 300 | 0.5 - 2 |
| | Carbon steel and alloy steel C55, 42CrMo4, etc. | | - 300 HB | First choice | AH3135 | MJ | 100 - 200 | 0.5 - 2 |
| | | | - 300 HB | Second choice | AH120 | MJ | 100 - 200 | 0.5 - 2 |
| | Prehardened steel NAK80, PX5, etc. | | 30 - 40 HRC | First choice | AH3135 | MJ | 100 - 200 | 0.5 - 1.5 |
| | | | 30 - 40 HRC | Second choice | AH120 | MJ | 100 - 200 | 0.5 - 1.5 |
| M | Stainless steel X5CrNi18-9, X5CrNiMo17-12-3, etc. | | - 200 HB | First choice | AH3135 | MJ | 100 - 150 | 0.3 - 1 |
| K | Grey cast iron 250,300, etc. | | 150 -250 HB | First choice | AH120 | MJ | 100 - 300 | 0.5 - 2 |
| | Ductile cast iron 600-3, etc. | | 150 -250 HB | First choice | AH120 | MJ | 80 - 200 | 0.5 - 2 |
| S | Titanium alloys Ti-6Al-4V, etc. | | - 40 HRC | First choice | AH3135 | MJ | 30 - 60 | 0.3 - 0.7 |
| | Superalloys Inconel718, etc. | | - 40 HRC | First choice | AH120 | MJ | 20 - 50 | 0.1 - 0.3 |
| H | Hardened steel | X40CrMoV5-1, etc. | 40 - 50 HRC | First choice | AH3135 | MJ | 80 - 130 | 0.1 - 0.3 |
| | | X153CrMoV12, etc. | 50 - 60 HRC | First choice | AH120 | MJ | 50 - 70 | 0.03 - 0.07 |

## APPLICATION RANGE




| Designation | Tool dia. øDc | Max. depth of cut ap | Max. plunging depth A | Max. ramping angle θ° | Max. cutting width in plunging W | Min. machining dia. øD1 | Max. machining dia. øD2 | Max. cutting width in enlarging ae |
|---|---|---|---|---|---|---|---|---|
| TXSW15M050B... | 50 | 2.5 | 0.7 | 4.8 | 15 | 70 | 95 | 36 |
| TXSW15M063B... | 63 | 2.5 | 0.7 | 2.9 | 15 | 96 | 121 | 49 |
| TXSW15M080B... | 80 | 2.5 | 0.7 | 2 | 15 | 130 | 155 | 66 |
| TXSW15M100B... | 100 | 2.5 | 0.7 | 1.4 | 15 | 170 | 195 | 86 |
| TXSW15M125B... | 125 | 2.5 | 0.7 | 1 | 15 | 220 | 245 | 111 |
| TXSW15M160B... | 160 | 2.5 | 0.7 | 0.7 | 15 | 290 | 315 | 146 |

## TOOL GEOMETRY ON PROGRAM



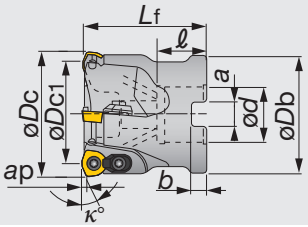

| Max. ap (mm) | Actual corner radius rε (mm) | W (mm) | Programmed corner radius R (mm) | Uncut amount t1 (mm) | Overcut amount t2 (mm) |
|---|---|---|---|---|---|
| 2.5 | 2 | 12.7 | 4 | 1.99 | - |
| 2.5 | 2 | 12.7 | 4.5 | 1.88 | - |
| 2.5 | 2 | 12.7 | 5 | 1.78 | 0.01 |

- When programming for CAM, the tool should be considered as a radius cutter. Usually, the corner radius should be set in R = 4.5 mm.
If a larger radius is used, overcutting may occur. The above table shows the uncut (t1) and overcut (t2) amounts for the programmed corner radius.

# MILLFEED
## TXP05/06/08/09
Super high feed milling cutter

A.R. = +5°, R.R. = -4° ~ -6°








| Designation | Max. *ap* | ø*Dc* | z | ø*Dc1* | ø*Db* | *Lf* | ø*d* | *ℓ* | *a* | *b* | *κ°* | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TXP05063RB-E | 1.5 | 63 | 6 | 55.4 | 59 | 50 | 22 | 20 | 10.4 | 6.3 | 15 | 0.8 | with | WPM*05... |
| TXP05080RB-E | 1.5 | 80 | 7 | 72.4 | 76 | 63 | 27 | 22 | 12.4 | 7 | 15 | 1.7 | with | WPM*05... |
| TXP06063RB-E | 1.5 | 63 | 5 | 54.4 | 59 | 50 | 22 | 20 | 10.4 | 6.3 | 20 | 0.7 | with | WPM*06... |
| TXP06080RB-E | 1.5 | 80 | 6 | 71.4 | 76 | 63 | 27 | 22 | 12.4 | 7 | 20 | 1.6 | with | WPM*06... |
| TXP08050R-E | 1.5 | 50 | 3 | 38.6 | 47 | 50 | 22 | 20 | 10.4 | 6.3 | 10 | 0.4 | without | WPMT08... |
| TXP08052R-E | 1.5 | 52 | 3 | 40.6 | 50 | 50 | 22 | 20 | 10.4 | 6.3 | 10 | 0.5 | without | WPMT08... |
| TXP08063R-E | 1.5 | 63 | 4 | 51.6 | 59 | 50 | 22 | 20 | 10.4 | 6.3 | 10 | 0.7 | without | WPMT08... |
| TXP08066R-E | 1.5 | 66 | 4 | 54.6 | 63 | 50 | 27 | 22 | 12.4 | 7 | 10 | 0.8 | without | WPMT08... |
| TXP08080R-E | 1.5 | 80 | 5 | 68.6 | 76 | 63 | 27 | 22 | 12.4 | 7 | 10 | 1.5 | without | WPMT08... |
| TXP08100R-E | 1.5 | 100 | 6 | 88.6 | 96 | 63 | 32 | 25 | 14.4 | 8 | 10 | 2.5 | without | WPMT08... |
| TXP09063R-E | 3 | 63 | 3 | 49.4 | 59 | 50 | 22 | 20 | 10.4 | 6.3 | 20 | 0.6 | without | WPMT09... |
| TXP09080R-E | 3 | 80 | 4 | 66.4 | 76 | 63 | 27 | 22 | 12.4 | 7 | 20 | 1.3 | without | WPMT09... |
| TXP09100R-E | 3 | 100 | 5 | 86.4 | 96 | 63 | 32 | 25 | 14.4 | 8 | 20 | 2.4 | without | WPMT09... |
| TXP09125R-E | 3 | 125 | 6 | 111.4 | 98 | 63 | 40 | 32 | 16.4 | 9 | 20 | 2.9 | without | WPMT09... |

### SPARE PARTS

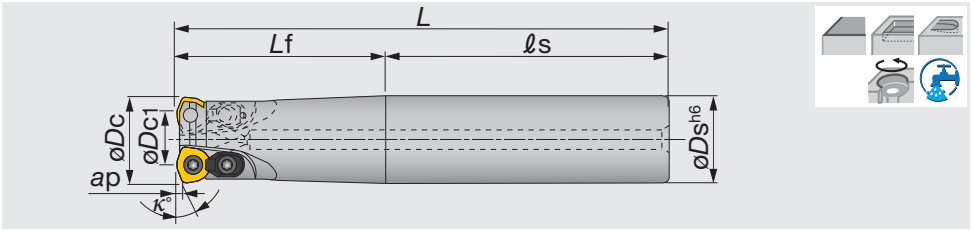
| Designation | Clamp set | Clamping screw | Lubricant | Shell locking bolt | Shell locking bolt 1 | Shell locking bolt 2 | Wrench | Wrench 1 |
|---|---|---|---|---|---|---|---|---|
| TXP05063RB-E | CSY-15 | CSPB-3.5S | M-1000 | - | CM10X30H | - | IP-15D | - |
| TXP05080RB-E | CSY-15 | CSPB-3.5S | M-1000 | - | - | CAP-CM12X1.75X30 | IP-15D | - |
| TXP06063RB-E | CSY-15 | CSPB-4S | M-1000 | - | CM10X30H | - | IP-15D | - |
| TXP06080RB-E | CSY-15 | CSPB-4S | M-1000 | - | CM12X30H | - | IP-15D | - |
| TXP08050, 052R-E | CSX20 | CSTB-5 | M-1000 | - | - | FSHM10-40 | - | T-20T |
| TXP08063, 066R-E | CSX20 | CSTB-5 | M-1000 | - | - | - | - | T-20T |
| TXP08080R-E | CSX20 | CSTB-5 | M-1000 | - | - | - | - | T-20T |
| TXP08100R-E | CSX20 | CSTB-5 | M-1000 | - | - | - | - | T-20T |
| TXP09063R-E | CSY-20 | CSPB-5 | M-1000 | - | - | - | - | IP-20T |
| TXP09080R-E | CSY-20 | CSPB-5 | M-1000 | - | - | - | - | IP-20T |
| TXP09100R-E | CSY-20 | CSPB-5 | M-1000 | - | - | - | - | IP-20T |
| TXP09125R-E | CSY-20 | CSPB-5 | M-1000 | - | - | - | - | IP-20T |

## EXP05/06/08/09

Super high feed endmill

A.R. = +5°, R.R. = -6°






| Designation | Max. *ap* | ø*D*c | z | ø*D*c1 | ø*D*s | *L* | *L*f | ℓs | κ° | Air hole | Insert | shank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EXP05020RL | 1.5 | 20 | 2 | 12.4 | 20 | 180 | 100 | 80 | 15 | with | WPM*05... | Cylindrical |
| EXP05020RLL | 1.5 | 20 | 2 | 12.4 | 20 | 250 | 130 | 120 | 15 | with | WPM*05... | Cylindrical |
| EXP05020RS | 1.5 | 20 | 2 | 12.4 | 20 | 130 | 50 | 80 | 15 | with | WPM*05... | Cylindrical |
| EXP05021RL | 1.5 | 21 | 2 | 13.4 | 20 | 180 | 100 | 80 | 15 | with | WPM*05... | Cylindrical |
| EXP05021RLL | 1.5 | 21 | 2 | 13.4 | 20 | 250 | 50 | 200 | 15 | with | WPM*05... | Cylindrical |
| EXP05021RS | 1.5 | 21 | 2 | 13.4 | 20 | 130 | 50 | 80 | 15 | with | WPM*05... | Cylindrical |
| EXP06025RL | 1.5 | 25 | 2 | 16.4 | 25 | 200 | 120 | 80 | 20 | with | WPM*06... | Cylindrical |
| EXP06025RLL | 1.5 | 25 | 2 | 16.4 | 25 | 300 | 180 | 120 | 20 | with | WPM*06... | Cylindrical |
| EXP06025RS | 1.5 | 25 | 2 | 16.4 | 25 | 140 | 60 | 80 | 20 | with | WPM*06... | Cylindrical |
| EXP06026RL | 1.5 | 26 | 2 | 17.4 | 25 | 200 | 120 | 80 | 20 | with | WPM*06... | Cylindrical |
| EXP06026RLL | 1.5 | 26 | 2 | 17.4 | 25 | 300 | 60 | 240 | 20 | with | WPM*06... | Cylindrical |
| EXP06026RS | 1.5 | 26 | 2 | 17.4 | 25 | 140 | 60 | 80 | 20 | with | WPM*06... | Cylindrical |
| EXP06032RL | 1.5 | 32 | 2 | 23.4 | 32 | 200 | 120 | 80 | 20 | with | WPM*06... | Cylindrical |
| EXP06032RLB | 1.5 | 32 | 3 | 23.4 | 32 | 200 | 120 | 80 | 20 | with | WPM*06... | Cylindrical |
| EXP06032RLL | 1.5 | 32 | 2 | 23.4 | 32 | 300 | 180 | 120 | 20 | with | WPM*06... | Cylindrical |
| EXP06032RS | 1.5 | 32 | 2 | 23.4 | 32 | 150 | 70 | 80 | 20 | with | WPM*06... | Cylindrical |
| EXP06032RSB | 1.5 | 32 | 3 | 23.4 | 32 | 150 | 70 | 80 | 20 | with | WPM*06... | Cylindrical |
| EXP06033RL | 1.5 | 33 | 2 | 24.4 | 32 | 200 | 120 | 80 | 20 | with | WPM*06... | Cylindrical |
| EXP06033RLB | 1.5 | 33 | 3 | 24.4 | 32 | 200 | 120 | 80 | 20 | with | WPM*06... | Cylindrical |
| EXP06033RLL | 1.5 | 33 | 2 | 24.4 | 32 | 300 | 70 | 230 | 20 | with | WPM*06... | Cylindrical |
| EXP06033RS | 1.5 | 33 | 2 | 24.4 | 32 | 150 | 70 | 80 | 20 | with | WPM*06... | Cylindrical |
| EXP06033RSB | 1.5 | 33 | 3 | 24.4 | 32 | 150 | 70 | 80 | 20 | with | WPM*06... | Cylindrical |
| EXP06040RL | 1.5 | 40 | 3 | 31.4 | 32 | 250 | 50 | 200 | 20 | with | WPM*06... | Cylindrical |
| EXP06040RLL | 1.5 | 40 | 3 | 31.4 | 32 | 300 | 50 | 250 | 20 | with | WPM*06... | Cylindrical |
| EXP06040RLS42 | 1.5 | 40 | 3 | 31.4 | 42 | 250 | 50 | 200 | 20 | with | WPM*06... | Cylindrical |
| EXP06040RS | 1.5 | 40 | 3 | 31.4 | 32 | 150 | 50 | 100 | 20 | with | WPM*06... | Cylindrical |
| EXP08040RLA | 1.5 | 40 | 2 | 28.6 | 32 | 250 | 50 | 200 | 10 | with | WPMT08... | Cylindrical |
| EXP08040RLL | 1.5 | 40 | 2 | 28.6 | 32 | 300 | 50 | 250 | 10 | with | WPMT08... | Cylindrical |
| EXP08040RSA | 1.5 | 40 | 2 | 28.6 | 32 | 150 | 50 | 100 | 10 | with | WPMT08... | Cylindrical |
| EXP09050RS | 3 | 50 | 2 | 36.4 | 42 | 150 | 50 | 100 | 20 | with | WPMT09... | Cylindrical |
| EXP09050RL | 3 | 50 | 2 | 36.4 | 42 | 250 | 50 | 200 | 20 | with | WPMT09... | Cylindrical |

### SPARE PARTS



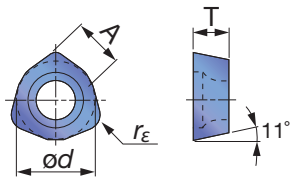




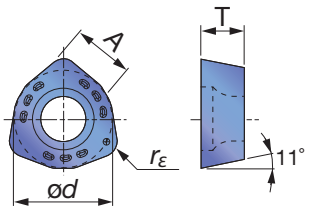
| Designation | Clamp set | Clamping screw | Lubricant | Wrench | Wrench 1 |
|---|---|---|---|---|---|
| EXP050... | - | CSPB-3.5S | M-1000 | IP-15D | - |
| EXP060... | CSY-15 | CSPB-4S | M-1000 | IP-15D | - |
| EXP080... | CSX20 | CSTB-5 | M-1000 | - | T-20T |
| EXP090... | CSY-20 | CSPB-5 | M-1000 | - | IP-20T |

## INSERT

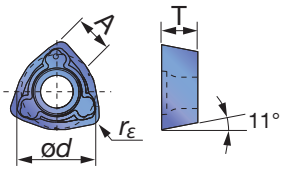
### WPMW05/06



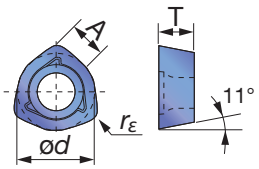

### WPMT08/09



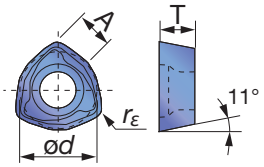

### WPMT05/06/08/09-ML




### WPMT05/06/08/09-MH




### WPMT05/06/08/09-DML




| | | AH120 | AH130 | AH140 | AH730 | T3130 |
|---|---|---|---|---|---|---|
| P | Steel | ★ | | | | ★ |
| M | Stainless | | ★ | ★ | | |
| K | Cast iron | ★ | | | | |
| N | Non-ferrous | | | | | |
| S | Superalloys | ★ | ☆ | | | |
| H | Hard materials | | | | ★ | |

★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | AH120 | AH130 | AH140 | AH730 | T3130 | A | ød | T |
|---|---|---|---|---|---|---|---|---|---|---|
| WPMW05H315ZPR | 1.5 | 1.5 | ● | | ● | | ● | 5 | 7.94 | 3.5 |
| WPMT05H315ZPR-ML | 1.5 | 1.5 | ● | | ● | | ● | 5 | 7.94 | 3.5 |
| WPMT05H315ZPR-MH | 1.5 | 1.5 | ● | | ● | | | 5 | 7.94 | 3.5 |
| WPMT05H315ZPR-DML | 1.5 | 1.5 | | | | ● | | 5 | 7.94 | 3.5 |
| WPMW06X415ZPR | 1.5 | 1.5 | ● | | ● | | ● | 6 | 9.525 | 4.2 |
| WPMT06X415ZPR-ML | 1.5 | 1.5 | ● | ● | ● | | ● | 6 | 9.525 | 4.2 |
| WPMT06X415ZPR-MH | 1.5 | 1.5 | ● | | ● | | | 6 | 9.525 | 4.2 |
| WPMT06X415ZPR-DML | 1.5 | 1.5 | | | | ● | | 6 | 9.525 | 4.2 |
| WPMT080615ZSR | 1.5 | 1.5 | ● | ● | ● | | ● | 8 | 12.87 | 6.35 |
| WPMT080615ZPR-ML | 1.5 | 1.5 | ● | ● | ● | | ● | 8 | 12.87 | 6.35 |
| WPMT080615ZSR-MH | 1.5 | 1.5 | ● | | ● | | | 8 | 12.87 | 6.35 |
| WPMT080615ZPR-DML | 1.5 | 1.5 | | | | ● | | 8 | 12.87 | 6.35 |
| WPMT090725ZSR | 2.5 | 3 | ● | | ● | | ● | 9 | 15 | 7 |
| WPMT090725ZPR-ML | 2.5 | 3 | ● | ● | ● | | ● | 9 | 15 | 7 |
| WPMT090725ZSR-MH | 2.5 | 3 | ● | ● | ● | | | 9 | 15 | 7 |
| WPMT090725ZPR-DML | 2.5 | 3 | | | | ● | | 9 | 15 | 7 |

●: Line-up

# STANDARD CUTTING CONDITIONS

## 05·06 type

| ISO | Workpiece material | Insert grade | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) | ø20, 21 (z = 2) | ø25, 26 (z = 2) | ø32, 33 (z = 2, 3) | ø40 (z = 3) | ø63 (z = 5, 6) | ø80 (z = 6, 7) |
|---|---|---|---|---|---|---|---|---|---|---|
| P | Carbon Steels C50, etc. < 300HB | AH120 (T3130) | 100 ~ 250 | 0.5 ~ 2 | *Vc* = 150 m/min, *fz* = 0.8 mm/t *ap* =1 mm, *ae* = 1D mm | *Vc* = 150 m/min, *fz* = 1 mm/t *ap* = 1 mm, *ae* = 1D mm | | | | |
| | | | | | When plunging in small depth: *fz* = 0.2 mm/t | | | | | |
| | Alloy steels 42CrMo4etc, etc. < 300 HB | AH120 (T3130) | 100 ~ 200 | 0.5 ~ 2 | *Vc* = 130 m/min, *fz* = 0.8 mm/t *ap* = 1 mm, *ae* = 1D mm | *Vc* = 130 m/min, *fz* = 1 mm/t *ap* = 1 mm, *ae* = 1D mm | | | | |
| | | | | | When plunging in small depth: *fz* = 0.2 mm/t | | | | | |
| | Prehardened steels NAK80, PX5, X96CrMoV12, etc. 30 ~ 40HRC | AH120 (T3130) | 80 ~ 150 | 0.5 ~ 1 | *Vc* = 100 m/min, *fz* = 0.5 mm/t *ap* = 1 mm, *ae* = 1D mm | *Vc* = 100 m/min, *fz* = 0.5 mm/t *ap* = 1 mm, *ae* = 1D mm | | | | |
| | | | | | When plunging in small depth: *fz* = 0.1 mm/t | | | | | |
| M | Stainless steels X5CrNi18 9, etc. | AH130 AH140 | 100 ~ 200 | 0.5 ~ 2 | *Vc* = 130 m/min, *fz* = 0.8 mm/t *ap* = 1 mm, *ae* = 1D mm | *Vc* = 130 m/min, *fz* = 1 mm/t *ap* = 1 mm, *ae* = 1D mm | | | | |
| | | | | | When plunging in small depth: *fz* = 0.2 mm/t | | | | | |
| K | Cast irons 250, etc. | AH120 | 100 ~ 250 | 0.8 ~ 2.5 | *Vc* = 150 m/min, *fz* = 1 mm/t *ap* = 1 mm, *ae* = 1D mm | *Vc* = 180 m/min, *fz* = 1.5 mm/t *ap* = 1 mm, *ae* = 1D mm | | | | |
| | | | | | When plunging in small depth: *fz* = 0.2 mm/t | | | | | |
| H | Hard materials X153CrMoV12, etc. 40 ~ 50HRC | AH730 | 50 ~ 80 | 0.5 ~ 1 | *Vc* = 70 m/min, *fz* = 0.7 mm/t, *ap* = 0.7 mm, *ae* = 1D mm | | | | | |
| | | | | | When plunging in small depth: *fz* = 0.1 mm/t | | | | | |

## 08 type

| ISO | Workpiece material | Insert grade | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) | ø40 (z = 2) | ø50 (z = 3) | ø63 (z = 4) | ø80 (z = 5) | ø100 (z = 6) |
|---|---|---|---|---|---|---|---|---|---|
| P | Carbon Steels C50, etc. < 300HB | AH120 (T3130) | 100 ~ 250 | 0.5 ~ 2 | *Vc* = 180 m/min, *fz* = 1 mm/t *ap* = 1 mm, *ae* = 40 mm | *Vc* = 200 m/min, *fz* = 1.5 mm/t *ap* = 1 mm, *ae* = 1D mm | | | |
| | | | | | When plunging in small depth: *fz* = 0.2 mm/t | | | | |
| | Alloy steels 42CrMo4, etc. < 300 HB | AH120 (T3130) | 100 ~ 200 | 0.5 ~ 2 | *Vc* = 130 m/min, *fz* = 1 mm/t *ap* = 1 mm, *ae* = 40 mm | *Vc* = 150 m/min, *fz* = 1.5 mm/t *ap* = 1 mm, *ae* = 1D mm | | | |
| | | | | | When plunging in small depth: *fz* = 0.2 mm/t | | | | |
| | Prehardened steels NAK80, PX5, X96CrMoV12, etc. 30 ~ 40HRC | AH120 (T3130) | 80 ~ 150 | 0.5 ~ 1 | *Vc* = 100 m/min, *fz* = 0.5 mm/t *ap* = 1 mm, *ae* = 40 mm | *Vc* = 120 m/min, *fz* = 0.8 mm/t *ap* = 1 mm, *ae* = 1D mm | | | |
| | | | | | When plunging in small depth: *fz* = 0.1 mm/t | | | | |
| M | Stainless steels X5CrNi18 9, etc. | AH130 AH140 | 100 ~ 200 | 0.5 ~ 2 | *Vc* = 130 m/min, *fz* = 1 mm/t *ap* = 1 mm, *ae* = 40 mm | *Vc* = 150 m/min, *fz* = 1.5 mm/t *ap* = 1 mm, *ae* = 1D mm | | | |
| | | | | | When plunging in small depth: *fz* = 0.2 mm/t | | | | |
| K | Cast irons 250, etc. | AH120 | 150 ~ 250 | 0.8 ~ 2.5 | *Vc* = 180 m/min, *fz* = 1.5 mm/t *ap* = 1 mm, *ae* = 40 mm | *Vc* = 200 m/min, *fz* = 2 mm/t *ap* = 1 mm, *ae* = 1D mm | | | |
| | | | | | When plunging in small depth: *fz* = 0.2 mm/t | | | | |
| H | Hard materials X153CrMoV12, etc. 40 ~ 50HRC | AH730 | 50 ~ 80 | 0.5 ~ 1 | *Vc* = 70 m/min, *fz* = 0.7 mm/t, *ap* = 0.7 mm, *ae* = 1D mm | | | | |
| | | | | | When plunging in small depth: *fz* = 0.1 mm/t | | | | |

Note: • The above values of cutting speed show the standard speed when overhang length of tool is below 3D. The cutting speed and the feed rate should be set at the lower limit values when overhang length of tool exceeds 3D.
• Thick and heavy chips are discharged by these TAC mills. Use internal air supply or air-blowing in order to prevent tool failure.

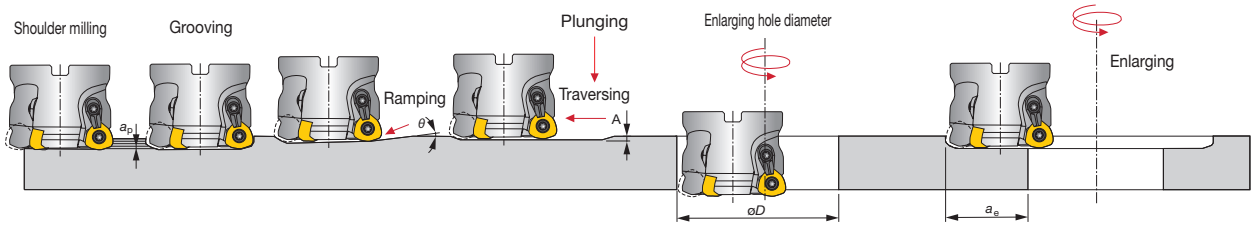
# STANDARD CUTTING CONDITIONS

## 09 type

| ISO | Workpiece material | Insert grade | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) | ø50 (z = 2) | ø63 (z = 3) | ø80 (z = 4) | ø100 (z = 5) | ø125 (z = 6) |
|---|---|---|---|---|---|---|---|---|---|
| P | Carbon Steels C50, etc. < 300HB | AH120 (T3130) | 100 ~ 250 | 0.5 ~ 2 | *Vc* = 200 m/min, *fz* = 1.5 mm/t, *ap* = 2 mm, *ae* = 1D mm | | | | |
| | | | | | When plunging in small depth: *fz* = 0.2 mm/t | | | | |
| | Alloy steels 42CrMo4etc, etc. < 300 HB | AH120 (T3130) | 100 ~ 200 | 0.5 ~ 2 | *Vc* = 150 m/min, *fz* = 1.5 mm/t, *ap* = 2 mm, *ae* = 1D mm | | | | |
| | | | | | When plunging in small depth: *fz* = 0.2 mm/t | | | | |
| | Prehardened steels NAK80, PX5, X96CrMoV12, etc. 30 ~ 40HRC | AH120 (T3130) | 80 ~ 150 | 0.5 ~ 1 | *Vc* = 120 m/min, *fz* = 0.8 mm/t, *ap* = 2 mm, *ae* = 1D mm | | | | |
| | | | | | When plunging in small depth: *fz* = 0.1 mm/t | | | | |
| M | Stainless steels X5CrNi18 9, etc. | AH130 AH140 | 100 ~ 200 | 0.5 ~ 2 | *Vc* = 150 m/min, *fz* = 1.5 mm/t, *ap* = 2 mm, *ae* = 1D mm | | | | |
| | | | | | When plunging in small depth: *fz* = 0.2 mm/t | | | | |
| K | Cast irons 250, etc. | AH120 | 150 ~ 250 | 0.8 ~ 2.5 | *Vc* = 200 m/min, *fz* = 2 mm/t, *ap* = 2 mm, *ae* = 1D mm | | | | |
| | | | | | When plunging in small depth: *fz* = 0.2 mm/t | | | | |
| H | Hard materials X153CrMoV12, etc. 40 ~ 50HRC | AH730 | 60 ~ 100 | 0.5 ~ 1 | *Vc* = 70 m/min, *fz* = 0.7 mm/t, *ap* = 0.7 mm, *ae* = 1D mm | | | | |
| | | | | | When plunging in small depth: *fz* = 0.1 mm/t | | | | |

Notes : The cutting speed and feed should be set to 70 to 80 % of the value shown in the above table when overhang length of tool exceeds 3D.

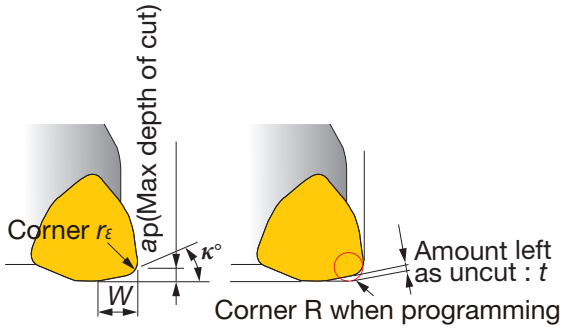
## APPLICATION RANGE



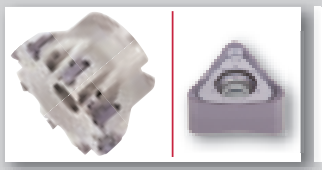

| Designation | øDc | Max. depth of cut ap | Max. ramping angle θ° | Max. plunging depth A | Min. machining hole dia. øD | Max. machining hole dia. øD | Max. cutting width in enlarging hole ae |
|---|---|---|---|---|---|---|---|
| EXP05020RS/L | 20 | 1.5 | 3 | 0.5 | 30 | 37 | 16 |
| EXP05021RS/L | 21 | 1.5 | 2.5 | 0.5 | 32 | 39 | 17 |
| TXP05063RB-E | 63 | 1.5 | 1 | 0.5 | 116 | 123 | 59 |
| TXP05080RB-E | 80 | 1.5 | 0.5 | 0.5 | 150 | 157 | 76 |
| E/HXP06025... | 25 | 1.5 | 5 | 1 | 33 | 47 | 20 |
| E/HXP06026... | 26 | 1.5 | 4.5 | 1 | 35 | 49 | 21 |
| E/HXP06032... | 32 | 1.5 | 3.5 | 1 | 47 | 61 | 27 |
| E/HXP06033... | 33 | 1.5 | 3 | 1 | 49 | 63 | 28 |
| E/HXP06040... | 40 | 1.5 | 2 | 1 | 63 | 77 | 35 |
| HXP06050R... | 50 | 1.5 | 1.5 | 1 | 83 | 97 | 45 |
| TXP06063RB-E | 63 | 1.5 | 1 | 1 | 109 | 123 | 58 |
| TXP06080RB-E | 80 | 1.5 | 0.5 | 1 | 143 | 157 | 75 |
| E/HXP08040R/L | 40 | 1.5 | 6 | 1 | 53 | 77 | 34 |
| T/HXP08050... | 50 | 1.5 | 4 | 1 | 72 | 97 | 44 |
| TXP08052R-E | 52 | 1.5 | 4 | 1 | 76 | 101 | 46 |
| TXP08063... | 63 | 1.5 | 2.5 | 1 | 98 | 123 | 57 |
| TXP08066R-E | 66 | 1.5 | 2.5 | 1 | 104 | 129 | 60 |
| TXP08080... | 80 | 1.5 | 1.5 | 1 | 132 | 157 | 74 |
| TXP08100... | 100 | 1.5 | 1 | 1 | 172 | 197 | 94 |
| EXP09050RS/L | 50 | 3 | 1.5 | 0.8 | 76 | 97 | 43 |
| HXP09050R... | 50 | 3 | 1.5 | 0.8 | 76 | 97 | 43 |
| TXP09063R... | 63 | 3 | 2 | 1.5 | 98 | 123 | 56 |
| TXP09080R... | 80 | 3 | 1.5 | 1.5 | 132 | 157 | 73 |
| TXP09100R... | 100 | 3 | 1 | 1.5 | 172 | 197 | 93 |
| TXP09125R... | 125 | 3 | 0.75 | 1.5 | 222 | 247 | 118 |

## TOOL GEOMETRY ON PROGRAM

When programming for CAD/CAM, the tool should be assumed to be a radius cutter shown in below table. In the case, the amount left as uncut (t) is shown below.




| TXP | Max. depth of cut ap | Corner of insert rε | Cutting edge angle κ° | W | t | Corner R when programming |
|---|---|---|---|---|---|---|
| 05 | 1.5 | 1.5 | 15 | 3.8 | 0.5 | R2 |
| 06 | 1.5 | 1.5 | 20 | 4.3 | 0.7 | R2.5 |
| 08 | 1.5 | 1.5 | 10 | 5.7 | 0.7 | R2 |
| 09 | 3 | 2.5 | 20 | 6.8 | 1.4 | R3 |
| 09 | 3 | 2.5 | 20 | 6.8 | 1.2 | R4 |

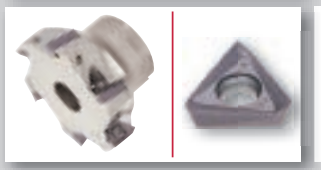


## DO-FORCE TRI — D034

Economical and versatile shoulder mills with double-sided triangular inserts

90° ø32 - ø125 mm
max. ap 11 mm

P M K S

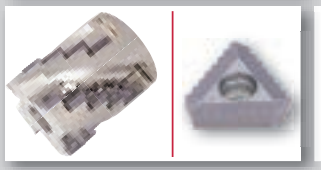


## TUNG-TRI — D038

High-precision shoulder mills with single-sided triangular inserts

90° ø12 - ø160 mm
max. ap 15 mm

P M K S



## TUNG-TRI SHRED — D047

Square shoulder milling cutters for roughing to produce shredded chips

90° ø50 - ø100 mm
max. ap 16 mm

P M K S



## TUNG-FORCE REC — D050

Mini square shoulder milling cutters for high productivity

90° ø8 - ø16 mm
max. ap 6 mm

P M K N S H



## TUNGREC — D054

Excellent surface finish and wall accuracy in shoulder milling

90° ø12 - ø160 mm
max. ap 16.7 mm

P M K N S



## TUNGQUAD — D070

Ideal tool for milling small parts on small machines

90° ø12 - ø40 mm
max. ap 4 mm

P M K N

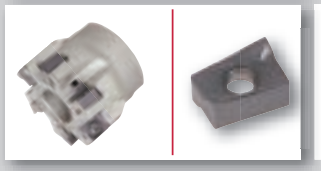


## TUNGMILL — D074

Single-sided inserts with low cutting force for shoulder milling

90° ø50 - ø125 mm
max. ap 10 mm

P M K N



## DOREC — D080

Shoulder milling cutters for general purpose with 4-cornered double-sided inserts

90° ø25 - ø160 mm
max. ap 16 mm

P M K S

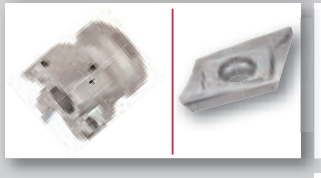


## TECMILL — D084

Shoulder milling cutters for heavy duty with 4-cornered tangentially mounted inserts

90° ø32 - ø125 mm
max. ap 15.1 mm

P M K S



## TUNG-ALUMILL — D086

Highly polished and positive routing cutters for aluminium and non-ferrous metals

90° ø25 - ø125 mm
max. ap 16 mm

N

## Other Shoulder Milling Tools — D089

EPH, ELP, EPE, T/EPS17, PES, ESD, TPP, TSE3000/4000, DEB1000



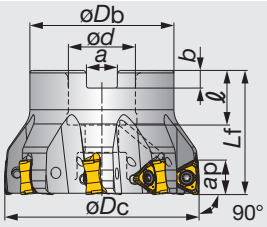
DoForce-Tri

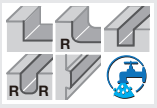
## TPTN12

### Square Shoulder milling cutters with double-sided triangular insert

A.R. = +4.2°~ +4.7°, R.R. = -15.4°~ -11.2°






| Designation | Max. *ap* | *øDc* | z | *øDb* | *Lf* | *ød* | *ℓ* | *a* | *b* | Kg | Air hole | C.bolt | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TPTN12M050B22.0R04 | 11 | 50 | 4 | 47 | 40 | 22 | 20 | 10.4 | 6.3 | 0.4 | with | CM10X30H | TN*U12... |
| TPTN12M050B22.0R05 | 11 | 50 | 5 | 47 | 40 | 22 | 20 | 10.4 | 6.3 | 0.4 | with | CM10X30H | TN*U12... |
| TPTN12M063B22.0R05 | 11 | 63 | 5 | 47 | 40 | 22 | 20 | 10.4 | 6.3 | 0.6 | with | CM10X30H | TN*U12... |
| TPTN12M063B22.0R06 | 11 | 63 | 6 | 47 | 40 | 22 | 20 | 10.4 | 6.3 | 0.6 | with | CM10X30H | TN*U12... |
| TPTN12M080B27.0R06 | 11 | 80 | 6 | 58 | 50 | 27 | 22 | 12.4 | 7 | 1.1 | with | CM12X30H | TN*U12... |
| TPTN12M080B27.0R08 | 11 | 80 | 8 | 58 | 50 | 27 | 22 | 12.4 | 7 | 1.1 | with | CM12X30H | TN*U12... |
| TPTN12M100B32.0R07 | 11 | 100 | 7 | 67 | 50 | 32 | 28.5 | 14.4 | 8 | 1.4 | with | TMBA-M16H | TN*U12... |
| TPTN12M100B32.0R10 | 11 | 100 | 10 | 67 | 50 | 32 | 28.5 | 14.4 | 8 | 1.4 | with | TMBA-M16H | TN*U12... |
| TPTN12M125B40.0R08 | 11 | 125 | 8 | 71 | 63 | 40 | 32 | 16.4 | 9 | 2.3 | with | TMBA-M20H | TN*U12... |
| TPTN12M125B40.0R12 | 11 | 125 | 12 | 71 | 63 | 40 | 32 | 16.4 | 9 | 2.4 | with | TMBA-M20H | TN*U12... |

### SPARE PARTS








| Designation | Clamping screw | Grip | Torx bit | Lubricant | Shell locking bolt | Shell locking bolt 1 |
|---|---|---|---|---|---|---|
| TPTN12M050, 063B... | CSPB-3.5 | H-TB2W | BLDIP15/S7 | M-1000 | - | CM10X30H |
| TPTN12*080B... | CSPB-3.5 | H-TB2W | BLDIP15/S7 | M-1000 | - | CM12X30H |
| TPTN12*100B... | CSPB-3.5 | H-TB2W | BLDIP15/S7 | M-1000 | TMBA-M16H | - |
| TPTN12*125B... | CSPB-3.5 | H-TB2W | BLDIP15/S7 | M-1000 | TMBA-M20H | - |



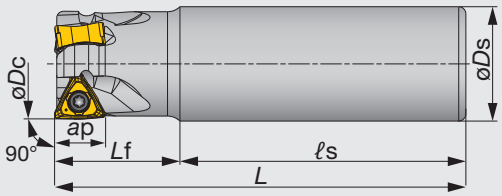


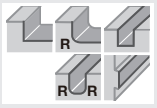
## EPTN12

### Square Shoulder milling endmills with double-sided triangular insert

A.R. = +4.2°~ +4.7°, R.R. = -15.4°~ -11.2°






| Designation | Max. *ap* | *øDc* | z | *øDs* | *ℓs* | *Lf* | *L* | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| EPTN12M032C32.0R02N | 11 | 32 | 2 | 32 | 80 | 35 | 115 | 0.7 | without | TN*U12... |
| EPTN12M032C32.0R03N | 11 | 32 | 3 | 32 | 80 | 35 | 115 | 0.7 | without | TN*U12... |
| EPTN12M040C32.0R03N | 11 | 40 | 3 | 32 | 80 | 35 | 115 | 0.8 | without | TN*U12... |
| EPTN12M040C32.0R04N | 11 | 40 | 4 | 32 | 80 | 35 | 115 | 0.8 | without | TN*U12... |

### SPARE PARTS



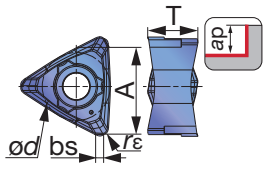



| Designation | Clamping screw | Grip | Torx bit | Lubricant |
|---|---|---|---|---|
| EPTN12... | CSPB-3.5 | H-TB2W | BLDIP15/S7 | M-1000 |

## INSERT

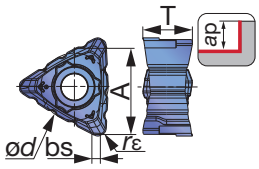
### TNGU-MJ





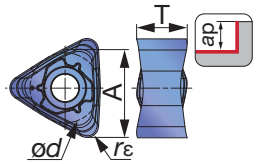

### TNGU-NMJ






### TNMU-R-MJ






| | | | |
|---|---|---|---|
| P | Steel | ☆ | ★ |
| M | Stainless | | ★ |
| K | Cast iron | ★ | |
| N | Non-ferrous | | |
| S | Superalloys | ★ | ☆ |
| H | Hard materials | | |

★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | Coating AH120 | Coating AH3135 | A | ød | T | bs |
|---|---|---|---|---|---|---|---|---|
| TNGU120708PER-MJ | 0.8 | 11 | ● | ● | 12 | 9.525 | 7.04 | 1.16 |
| TNGU120708PER-NMJ | 0.8 | 11 | ● | ● | 12 | 9.525 | 7.04 | 1.16 |
| TNMU1207R16PER-MJ | 1.6 | 11 | ● | ● | 12 | 9.525 | 7.04 | - |

●: Line-up

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Hardness | Priority | Grade | Chip-breaker | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) |
|---|---|---|---|---|---|---|---|
| P | Low carbon steel C15E4, E275A, etc. | - 300 HB | First choice | AH3135 | MJ | 100 - 250 | 0.08 - 0.3 |
| | | - 300 HB | For low cutting force | AH3135 | NMJ | 100 - 250 | 0.08 - 0.14 |
| | Carbon steel and alloy steel C55, 42CrMo4, etc. | - 300 HB | First choice | AH3135 | MJ | 100 - 230 | 0.08 - 0.3 |
| | | - 300 HB | For low cutting force | AH3135 | NMJ | 100 - 230 | 0.08 - 0.14 |
| | Prehardened steel NAK80, PX5, etc. | 30 - 40 HRC | First choice | AH3135 | MJ | 100 - 180 | 0.08 - 0.25 |
| | | 30 - 40 HRC | For low cutting force | AH3135 | NMJ | 100 - 180 | 0.08 - 0.14 |
| M | Stainless steel X5CrNi18-9, X5CrNiMo17-12-3, etc. | - | First choice | AH3135 | MJ | 90 - 200 | 0.08 - 0.25 |
| | | - | For low cutting force | AH3135 | NMJ | 90 - 200 | 0.08 - 0.14 |
| K | Grey cast iron 250, 300, etc. | 150 - 250 HB | First choice | AH120 | MJ | 140 - 250 | 0.08 - 0.3 |
| | | 150 - 250 HB | For low cutting force | AH120 | NMJ | 140 - 250 | 0.08 - 0.14 |
| | Ductile cast iron 600-3, etc. | 150 - 250 HB | First choice | AH120 | MJ | 110 - 200 | 0.08 - 0.25 |
| | | 150 - 250 HB | For low cutting force | AH120 | NMJ | 110 - 200 | 0.08 - 0.14 |
| S | Titanium alloys Ti-6Al-4V, etc. | - | First choice | AH120 | MJ | 20 - 60 | 0.08 - 0.2 |
| | | - | For low cutting force | AH120 | NMJ | 20 - 60 | 0.08 - 0.14 |
| | Heat-resistant alloys Inconel718, etc. | - | First choice | AH120 | MJ | 20 - 40 | 0.07 - 0.18 |
| | | - | For low cutting force | AH120 | NMJ | 20 - 40 | 0.07 - 0.14 |

Note: When you use the NMJ chipbreaker, please set up the feed less than 0.15 mm/t.

MEMO

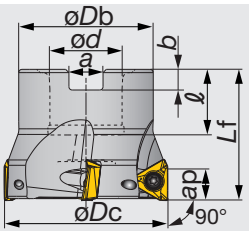
TUNG-TRI

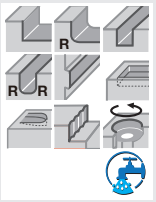
## TPA06

High precision square shoulder milling cutters with triangular inserts

A.R. = +8.5°~ +11.5°, R.R. = -5.5°~ -12.5°





| Designation | Max. *ap* | *øDc* | z | *øDb* | *ød* | *ℓ* | *Lf* | *b* | *a* | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TPA06R032M16.0E05 | 6 | 32 | 5 | 30 | 16 | 18 | 40 | 5.6 | 8.4 | 0.14 | with | TOMT06... |
| TPA06R040M16.0E06 | 6 | 40 | 6 | 35 | 16 | 18 | 40 | 5.6 | 8.4 | 0.22 | with | TOMT06... |
| TPA06R050M22.0E08 | 6 | 50 | 8 | 41 | 22 | 20 | 40 | 6.3 | 10.4 | 0.31 | with | TOMT06... |

### SPARE PARTS

| Designation | Clamping screw | Lubricant | Shell locking bolt | Wrench |
|---|---|---|---|---|
| TPA06R032M16.0E05 | CSTB-2.5 | M-1000 | FSHM8-30H | T-8D |
| TPA06R040M16.0E06 | CSTB-2.5 | M-1000 | CM8X30H | T-8D |
| TPA06R050M22.0E08 | CSTB-2.5 | M-1000 | CM10X30H | T-8D |

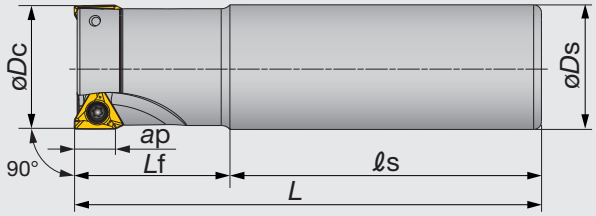
TUNG-TRI

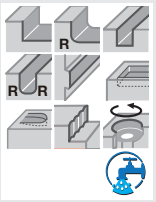
## EPA06

High precision square shoulder milling endmills with triangular inserts

A.R. = +8.5°~ +11.5°, R.R. = -5.5°~ -12.5°





| Designation | Max. *ap* | *øDc* | z | *øDs* | *ℓs* | *Lf* | *L* | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| EPA06R012M16.0-01N | 6 | 12 | 1 | 16 | 50 | 18 | 68 | 0.09 | without | TOMT06... |
| EPA06R016M16.0-02N | 6 | 16 | 2 | 16 | 60 | 24 | 84 | 0.12 | without | TOMT06... |
| EPA06R016M16.0-02L | 6 | 16 | 2 | 16 | 105 | 40 | 145 | 0.2 | with | TOMT06... |
| EPA06R018M16.0-02N | 6 | 18 | 2 | 16 | 60 | 24 | 84 | 0.13 | without | TOMT06... |
| EPA06R018M16.0-02L | 6 | 18 | 2 | 16 | 115 | 30 | 145 | 0.21 | with | TOMT06... |
| EPA06R020M16.0-02N | 6 | 20 | 2 | 16 | 60 | 30 | 90 | 0.14 | without | TOMT06... |
| EPA06R020M20.0-02N | 6 | 20 | 2 | 20 | 70 | 30 | 100 | 0.23 | without | TOMT06... |
| EPA06R020M20.0-03N | 6 | 20 | 3 | 20 | 70 | 30 | 100 | 0.22 | without | TOMT06... |
| EPA06R020M20.0-02L | 6 | 20 | 2 | 20 | 135 | 50 | 185 | 0.41 | with | TOMT06... |
| EPA06R022M20.0-02N | 6 | 22 | 2 | 20 | 70 | 30 | 100 | 0.23 | without | TOMT06... |
| EPA06R022M20.0-03N | 6 | 22 | 3 | 20 | 70 | 30 | 100 | 0.23 | without | TOMT06... |
| EPA06R022M20.0-02L | 6 | 22 | 2 | 20 | 145 | 40 | 185 | 0.42 | with | TOMT06... |
| EPA06R025M25.0-03N | 6 | 25 | 3 | 25 | 80 | 35 | 115 | 0.41 | without | TOMT06... |
| EPA06R025M25.0-04N | 6 | 25 | 4 | 25 | 80 | 35 | 115 | 0.41 | without | TOMT06... |
| EPA06R025M25.0-02L | 6 | 25 | 2 | 25 | 150 | 70 | 220 | 0.78 | with | TOMT06... |
| EPA06R028M25.0-03N | 6 | 28 | 3 | 25 | 80 | 35 | 115 | 0.42 | without | TOMT06... |
| EPA06R028M25.0-04N | 6 | 28 | 4 | 25 | 80 | 35 | 115 | 0.42 | without | TOMT06... |
| EPA06R028M25.0-02L | 6 | 28 | 2 | 25 | 180 | 40 | 220 | 0.8 | with | TOMT06... |

### SPARE PARTS

| Designation | Clamping screw | Lubricant | Wrench |
|---|---|---|---|
| EPA06R012 - 018M... | CSTB-2.5S | M-1000 | T-8D |
| EPA06R020 - 028M... | CSTB-2.5 | M-1000 | T-8D |

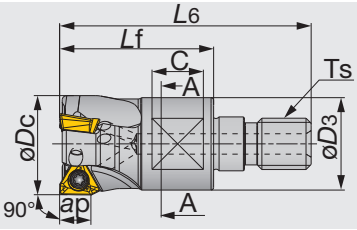
TUNG-TRI

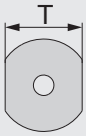
## HPA06-M

High precision square shoulder milling endmills with triangular inserts

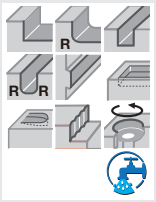
A.R. = +8.5°~ +11.5°, R.R. = -12.5°~ -5.5°






A-A cross section




| Designation | Max. ap | øDc | z | L6 | Lf | C | T | øD3 | Ts | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HPA06R016MM08-02 | 6 | 16 | 2 | 42 | 25 | 8 | 10 | 13 | M8 | 0.03 | with | TOMT06... |
| HPA06R020MM10-03 | 6 | 20 | 3 | 49 | 30 | 10 | 15 | 18 | M10 | 0.06 | with | TOMT06... |
| HPA06R025MM12-04 | 6 | 25 | 4 | 57 | 35 | 10 | 17 | 21 | M12 | 0.1 | with | TOMT06... |
| HPA06R032MM16-05 | 6 | 32 | 5 | 63 | 40 | 12 | 22 | 29 | M16 | 0.20 | with | TOMT06... |

### SPARE PARTS

| Designation | Clamping screw | Lubricant | Wrench |
|---|---|---|---|
| HPA06R016MM08-02 | CSTB-2.5S | M-1000 | T-8D |
| HPA06R020 - 032MM... | CSTB-2.5 | M-1000 | T-8D |

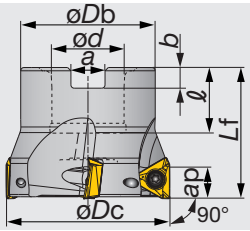
TUNG-TRI

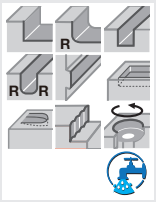
## TPA10

High precision square shoulder milling cutters with triangular inserts

A.R. = +9.5°~ +11°, R.R. = -4.5°~ -0.5°






| Designation | Max. ap | øDc | z | øDb | ød | ℓ | Lf | b | a | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TPA10R040M16.0E04 | 10 | 40 | 4 | 35 | 16 | 18 | 40 | 5.6 | 8.4 | 0.2 | with | TOMT10... |
| TPA10R050M22.0E04 | 10 | 50 | 4 | 41 | 22 | 20 | 40 | 6.3 | 10.4 | 0.31 | with | TOMT10... |
| TPA10R063M22.0E06 | 10 | 63 | 6 | 41 | 22 | 20 | 40 | 6.3 | 10.4 | 0.51 | with | TOMT10... |
| TPA10R080M27.0E07 | 10 | 80 | 7 | 58 | 27 | 22 | 50 | 7 | 12.4 | 1.04 | with | TOMT10... |
| TPA10R100M32.0E08 | 10 | 100 | 8 | 60 | 32 | 28.5 | 50 | 8 | 14.4 | 2.02 | with | TOMT10... |

### SPARE PARTS

| Designation | Clamping screw | Grip | Lubricant | Shell locking bolt | Torx bit |
|---|---|---|---|---|---|
| TPA10R040M16.0E04 | SR14-562/S | SW6-SD | M-1000 | CM8X30H | BLDT10/S7 |
| TPA10R050, 063M... | SR14-562/S | SW6-SD | M-1000 | CM10X30H | BLDT10/S7 |
| TPA10R080M... | SR14-562/S | SW6-SD | M-1000 | CM12X30H | BLDT10/S7 |
| TPA10R100M... | SR14-562/S | SW6-SD | M-1000 | CM16X40H | BLDT10/S7 |

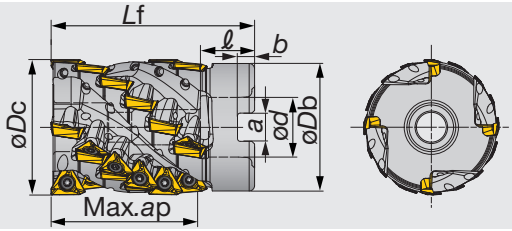
TUNG-TRI

## TLA10

Extended Flute square shoulder mills for roughing with triangular inserts

A.R. = +9.5°~ +11°, R.R. = -4.5°~ -0.5°








| Designation | Max. *ap* | ø*Dc* | Z eff | z | ø*Db* | ø*d* | *ℓ* | *Lf* | *b* | *a* | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TLA10R050L054M22.0E04 | 54 | 50 | 4 | 24 | 47 | 22 | 20 | 75 | 6.3 | 10.4 | 0.64 | with | TOMT10... |
| TLA10R063L054M27.0E04 | 54 | 63 | 4 | 24 | 60 | 27 | 22 | 80 | 7 | 12.4 | 1.25 | with | TOMT10... |

### SPARE PARTS

| Designation | Clamping screw | Lubricant | Shell locking bolt | Shell locking bolt 1 | Wrench |
|---|---|---|---|---|---|
| TLA10R050L054M22.0E04 | SR14-562 | M-1000 | CAP-CM10X1.5X55-H | - | T-10D |
| TLA10R063L054M27.0E04 | SR14-562 | M-1000 | - | CAP-CM12X1.75X50 | T-10D |

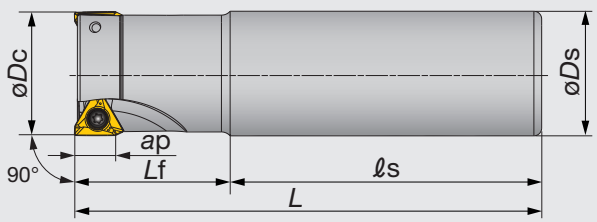
TUNG-TRI

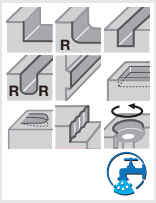
## EPA10

High precision square shoulder milling endmills with triangular inserts

A.R. = +9.5°~ +11°, R.R. = -4.5°~ -0.5°





| Designation | Max. *ap* | ø*Dc* | z | ø*Ds* | *ℓs* | *Lf* | *L* | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| EPA10R025M25.0-02N | 10 | 25 | 2 | 25 | 80 | 35 | 115 | 0.38 | without | TOMT10... |
| EPA10R025M25.0-02L | 10 | 25 | 2 | 25 | 150 | 70 | 220 | 0.75 | with | TOMT10... |
| EPA10R028M25.0-02N | 10 | 28 | 2 | 25 | 80 | 35 | 115 | 0.39 | without | TOMT10... |
| EPA10R028M25.0-02L | 10 | 28 | 2 | 25 | 185 | 35 | 220 | 0.78 | with | TOMT10... |
| EPA10R032M32.0-02N | 10 | 32 | 2 | 32 | 80 | 40 | 120 | 0.66 | without | TOMT10... |
| EPA10R032M32.0-03N | 10 | 32 | 3 | 32 | 80 | 40 | 120 | 0.65 | without | TOMT10... |
| EPA10R032M32.0-02L | 10 | 32 | 2 | 32 | 175 | 80 | 255 | 1.46 | with | TOMT10... |
| EPA10R035M32.0-02N | 10 | 35 | 2 | 32 | 80 | 40 | 120 | 0.7 | without | TOMT10... |
| EPA10R035M32.0-03N | 10 | 35 | 3 | 32 | 80 | 40 | 120 | 0.68 | without | TOMT10... |
| EPA10R035M32.0-02L | 10 | 35 | 2 | 32 | 215 | 40 | 255 | 1.52 | with | TOMT10... |
| EPA10R040M32.0-03N | 10 | 40 | 3 | 32 | 80 | 40 | 120 | 0.72 | without | TOMT10... |
| EPA10R040M32.0-04N | 10 | 40 | 4 | 32 | 80 | 40 | 120 | 0.73 | without | TOMT10... |
| EPA10R040M32.0-02L | 10 | 40 | 2 | 32 | 205 | 50 | 255 | 1.57 | with | TOMT10... |

### SPARE PARTS

| Designation | Clamping screw | Grip | Lubricant | Torx bit |
|---|---|---|---|---|
| EPA10... | SR14-562/S | SW6-SD | M-1000 | BLDT10/S7 |

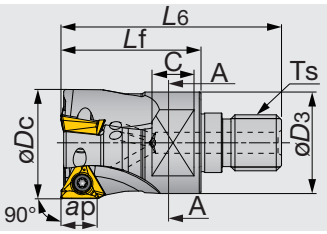
TUNG-TRI

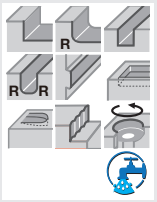
## HPA10-M

High precision square shoulder milling endmills with triangular inserts

A.R. = +9.5°~ +11°, R.R. = -4.5°~ -0.5°





| Designation | Max. ap | øDc | z | L6 | Lf | C | T | øD3 | Ts | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HPA10R025MM12-02 | 10 | 25 | 2 | 57 | 35 | 10 | 17 | 21 | M8 | 0.08 | with | TOMT10... |
| HPA10R032MM16-03 | 10 | 32 | 3 | 63 | 40 | 12 | 22 | 29 | M10 | 0.18 | with | TOMT10... |

### SPARE PARTS






| Designation | Clamping screw | Grip | Lubricant | Torx bit |
|---|---|---|---|---|
| HPA10... | SR14-562/S | SW6-SD | M-1000 | BLDT10/S7 |

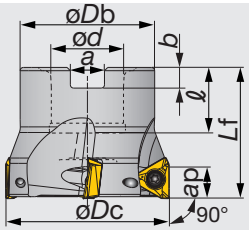
TUNG-TRI

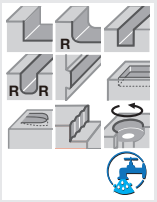
## TPA15

High precision square shoulder milling cutters with triangular inserts

A.R. = +12°~ +13.5°, R.R. = -6°~ -3.5°





| Designation | Max. ap | øDc | z | øDb | ød | ℓ | Lf | b | a | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TPA15R050M22.0E04 | 15 | 50 | 4 | 41 | 22 | 20 | 40 | 6.3 | 10.4 | 0.27 | with | TOMT15... |
| TPA15R063M22.0E05 | 15 | 63 | 5 | 41 | 22 | 20 | 40 | 6.3 | 10.4 | 0.41 | with | TOMT15... |
| TPA15R080M27.0E06 | 15 | 80 | 6 | 50 | 27 | 22 | 50 | 7 | 12.4 | 0.86 | with | TOMT15... |
| TPA15R100M32.0E07 | 15 | 100 | 7 | 60 | 32 | 28.5 | 50 | 8 | 14.4 | 1.27 | with | TOMT15... |
| TPA15R125M40.0E08 | 15 | 125 | 8 | 71 | 40 | 32 | 63 | 9 | 16.4 | 2.47 | with | TOMT15... |
| TPA15R160M40.0E10N | 15 | 160 | 10 | 100 | 40 | 32 | 63 | 9 | 16.4 | 4.77 | without | TOMT15... |

### SPARE PARTS








| Designation | Clamping screw | Grip | Lubricant | Shell locking bolt | Shell locking bolt 1 | Torx bit |
|---|---|---|---|---|---|---|
| TPA15R050M22.0E04 | TS45120I | H-TB2W | M-1000 | - | FSHM10-40H | BT20S |
| TPA15R063M22.0E05 | TS45120I | H-TB2W | M-1000 | - | CM10X30H | BT20S |
| TPA15R080M27.0E06 | TS45120I | H-TB2W | M-1000 | - | CM12X30H | BT20S |
| TPA15R100M32.0E07 | TS45120I | H-TB2W | M-1000 | TMBA-M16H | - | BT20S |
| TPA15R125M40.0E08 | TS45120I | H-TB2W | M-1000 | TMBA-M20H | - | BT20M |
| TPA15R160M40.0E10N | TS45120I | H-TB2W | M-1000 | - | - | BT20M |

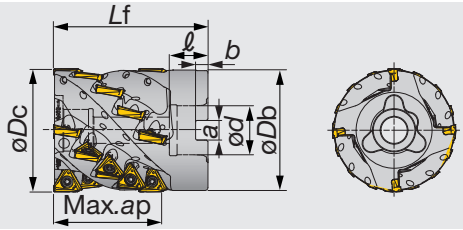
# TUNG-TRI

## TLA15-M

Extended Flute square shoulder mills for roughing with triangular inserts

A.R. = +12°~ +13.5°, R.R. = -6°~ -3.5°









| Designation | Max. *ap* | ø*D*c | Z eff | z | ø*D*b | ø*d* | ℓ | *L*f | *b* | *a* | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TLA15R080L070M32.0E04M | 70 | 80 | 4 | 20 | 78 | 32 | 25 | 100 | 8 | 14.4 | 2.38 | with | TOMT15... |
| TLA15R100L083M40.0E05M | 83 | 100 | 5 | 30 | 98 | 40 | 32 | 110 | 9. | 16.4 | 4.26 | with | TOMT15... |

### SPARE PARTS







| Designation | Clamping screw | Grip | Torx bit | Lubricant | Shell locking bolt |
|---|---|---|---|---|---|
| TLA15R080L070M32.0E04M | TS45120I | H-TB2W | BT20S | M-1000 | CM16X75 |
| TLA15R100L083M40.0E05M | TS45120I | H-TB2W | BT20S | M-1000 | CM20X80 |

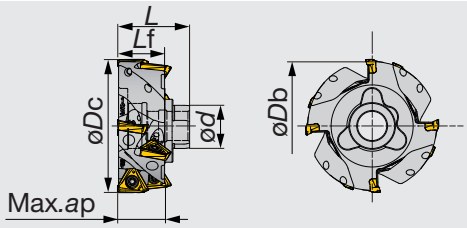
# TUNG-TRI

## TLA15-S

Sub unit to mount on TLA15-M type for longer Max. ap reach

A.R. = +12°~ +13.5°, R.R. = -6°~ -3.5°









| Designation | Max. *ap* | ø*D*c | Z eff | z | ø*D*b | ø*d* | *L* | *L*f | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TLA15R080L028-04S | 28 | 80 | 4 | 8 | 77.6 | 27 | 43 | 28.2 | 0.65 | with | TOMT15… |
| TLA15R100L028-05S | 28 | 100 | 5 | 10 | 97.2 | 33 | 46 | 28 | 1.05 | with | TOMT15… |

### SPARE PARTS






| Designation | Clamping screw | Grip | Lubricant | Torx bit |
|---|---|---|---|---|
| TLA15... | TS45120I | H-TB2W | M-1000 | BT20S |

### CENTER BOLT

*Optional parts



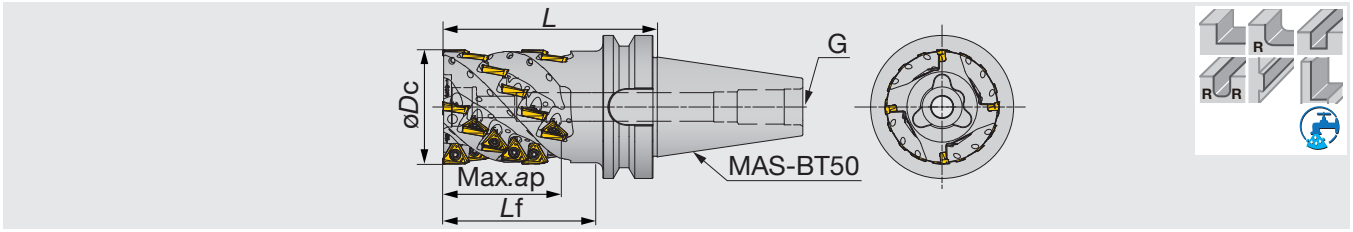

| No.of sub-units | 1 | 2 |
|---|---|---|
| TLA15R080L028-04S | CM16x120 | CM16x140 |
| TLA15R100L028-05S | CM20x120 | CM20x150 |

TUNG-TRI

## TLA15-BT

Square shoulder mills for roughing with TOMT15 inserts, Main unit with BT tapered shanks

A.R. = +12°~ +13.5°, R.R. = -6°~ -3.5°




| Designation | Max. *ap* | ø*Dc* | Z eff | z | *L* | *Lf* | Kg | Air hole | G | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| TLA15R080L083BT50-04M | 83 | 80 | 4 | 24 | 150 | 107 | 6.29 | with | M24 | TOMT15... |
| TLA15R100L097BT50-05M | 97 | 100 | 5 | 35 | 165 | 126.5 | 8.92 | with | M24 | TOMT15... |

### SPARE PARTS

| Designation | Clamping screw | Grip | Lubricant | Torx bit | Shell locking bolt |
|---|---|---|---|---|---|
| TLA15R080L083BT50-04M | TS45120I | H-TB2W | M-1000 | BT20S | CAP-CM16×2.0×55 |
| TLA15R100L097BT50-05M | TS45120I | H-TB2W | M-1000 | BT20S | CAP-CM20×2.5×50 |

### CENTER BOLT

*Optional parts

| No.of sub-units | 1 | 2 |
|---|---|---|
| TLA15R080L083BT50-04M | CAP-CM16×2.0×55 | CM16x120 |
| TLA15R100L097BT50-05M | CAP-CM20×2.5×50 | CM20x80 |

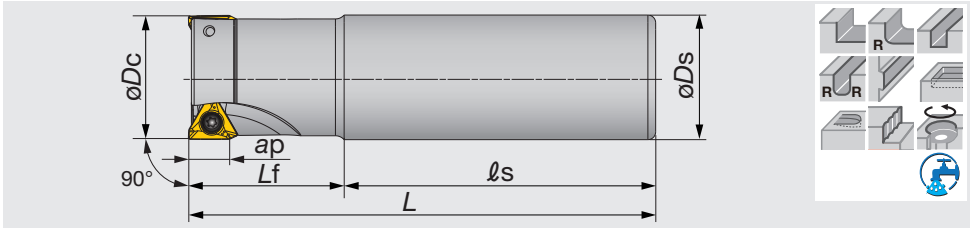
TUNG-TRI

## EPA15

High precision square shoulder milling endmills with triangular inserts

A.R. = +12°~ +13.5°, R.R. = -6°~ -3.5°






| Designation | Max. *ap* | ø*Dc* | z | ø*Ds* | *ℓs* | *Lf* | *L* | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| EPA15R040M32.0-03N | 15 | 40 | 3 | 32 | 80 | 40 | 120 | 0.73 | without | TOMT15... |
| EPA15R040M32.0-02L | 15 | 40 | 2 | 32 | 205 | 50 | 255 | 1.56 | with | TOMT15... |
| EPA15R050M32.0-04N | 15 | 50 | 4 | 32 | 80 | 40 | 120 | 0.83 | without | TOMT15... |
| EPA15R050M42.0-02L | 15 | 50 | 2 | 42 | 310 | 50 | 360 | 3.84 | with | TOMT15... |

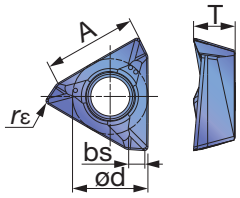
### SPARE PARTS

| Designation | Clamping screw | Grip | Lubricant | Torx bit |
|---|---|---|---|---|
| EPA15... | TS45120I | H-TB2W | M-1000 | BT20S |

## INSERT

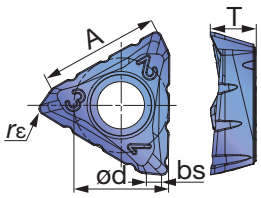
### TOMT-MJ






### TOMT-NMJ






| | | | | |
|---|---|---|---|---|
| P | Steel | ☆ | ★ | |
| M | Stainless | | ★ | |
| K | Cast iron | ★ | | ★ |
| N | Non-ferrous | | | |
| S | Superalloys | ★ | ☆ | |
| H | Hard materials | | | |

★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | Coating | | | A | ød | T | bs |
|---|---|---|---|---|---|---|---|---|---|
| | | | AH120 | AH3135 | T1215 | | | | |
| TOMT060302PDER-MJ | 0.2 | 6 | ● | ● | | 6.2 | 5.6 | 3.2 | 1.4 |
| TOMT060304PDER-MJ | 0.4 | 6 | ● | ● | | 6.2 | 5.6 | 3.2 | 1.2 |
| TOMT060308PDER-MJ | 0.8 | 6 | ● | ● | ● | 6.2 | 5.6 | 3.2 | 0.8 |
| TOMT100404PDER-MJ | 0.4 | 10 | ● | ● | | 10.5 | 8.6 | 4.7 | 1.5 |
| TOMT100408PDER-MJ | 0.8 | 10 | ● | ● | ● | 10.5 | 8.6 | 4.7 | 1.1 |
| TOMT100416PDER-MJ | 1.6 | 10 | ● | ● | | 10.5 | 8.6 | 4.7 | 0.2 |
| TOMT150604PDER-MJ | 0.4 | 15 | ● | ● | | 15.7 | 12.7 | 6 | 2.2 |
| TOMT150608PDER-MJ | 0.8 | 15 | ● | ● | ● | 15.7 | 12.7 | 6 | 1.9 |
| TOMT150616PDER-MJ | 1.6 | 15 | ● | ● | | 15.7 | 12.7 | 6 | 1.1 |
| TOMT150620PDER-MJ | 2 | 15 | ● | ● | | 15.7 | 12.7 | 6 | 0.7 |
| TOMT150608PDER-NMJ | 0.8 | 15 | ● | ● | | 15.7 | 12.7 | 6 | 1.9 |

●: Line-up

## STANDARD CUTTING CONDITIONS

### TPA/EPA/HPA

| ISO | Workpiece material | Hardness | Grade | Cutting speed: *Vc* (m/min) | | | Feed per tooth: *fz* (mm/t) | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | T/E/HPA06 | T/E/HPA10 | T/E/HPA15 | T/E/HPA06 | T/E/HPA10 | T/EPA15 |
| P | Low carbon steel E275A, C15E4, etc. | - 200 HB | AH3135 | 100 - 220 | 100 - 250 | 100 - 250 | 0.05 - 0.15 | 0.08 - 0.2 | 0.08 - 0.25 |
| P | High carbon steel C45, etc. | 200 - 300 HB | AH3135 | 100 - 170 | 100 - 200 | 100 - 230 | 0.05 - 0.12 | 0.08 - 0.15 | 0.08 - 0.2 |
| P | Alloy steel 42CrMo4, etc. | 200 - 300 HB | AH3135 | 100 - 170 | 100 - 200 | 100 - 230 | 0.05 - 0.12 | 0.08 - 0.15 | 0.08 - 0.2 |
| P | Tool steel X40CrMoV5-1, etc. | 30 - 40 HRC | AH3135 | 100 - 120 | 100 -150 | 100 - 180 | 0.05 - 0.12 | 0.08 - 0.15 | 0.08 - 0.2 |
| M | Stainless steel X5CrNi18-9, etc. | - | AH3135 | 80 - 150 | 80 - 200 | 90 - 200 | 0.05 - 0.15 | 0.08 - 0.2 | 0.08 - 0.2 |
| K | Grey cast iron 250, etc. | 150 - 250 HB | AH120<br>T1215 | 100 - 200<br>150 - 250 | 100 - 250<br>150 - 300 | 140 - 250<br>200 - 300 | 0.05 - 0.15 | 0.08 - 0.2 | 0.08 - 0.25 |
| K | Ductile cast iron 450-10S, etc. | 150 - 250 HB | AH120<br>T1215 | 80 - 150<br>100 - 200 | 80 - 200<br>130 - 250 | 110 - 200<br>150 - 250 | 0.05 - 0.15 | 0.08 - 0.2 | 0.08 - 0.25 |
| S | Titanium alloys Ti-6Al-4V, etc. | - | AH120 | 20 - 50 | 20 - 60 | 20 - 60 | 0.05 - 0.1 | 0.08 - 0.15 | 0.08 - 0.18 |
| S | Heat-resistant alloys Inconel 718, etc. | - | AH120 | 20 - 35 | 20 - 40 | 20 - 40 | 0.03 - 0.08 | 0.05 - 0.13 | 0.07 - 0.15 |

Note: When you use the NMJ chipbreaker, please set up the feed less than 0.15 mm/t.

- Remove excessive chip accumulation with an air blast.
- For the operation with depth of cut which varies (ex.casting skin) and machining of workpiece materials with interrupted surface, the feed per tooth (*fz*) should be set to the lower recommended value shown in the above table.
- Cutting conditions maybe limited depending on machine power, workpiece rigidity, and spindle output. When the cutting width, depth, or overhang length is large, set *Vc* and *fz* to the lower recommended values and check the machine power and vibration.

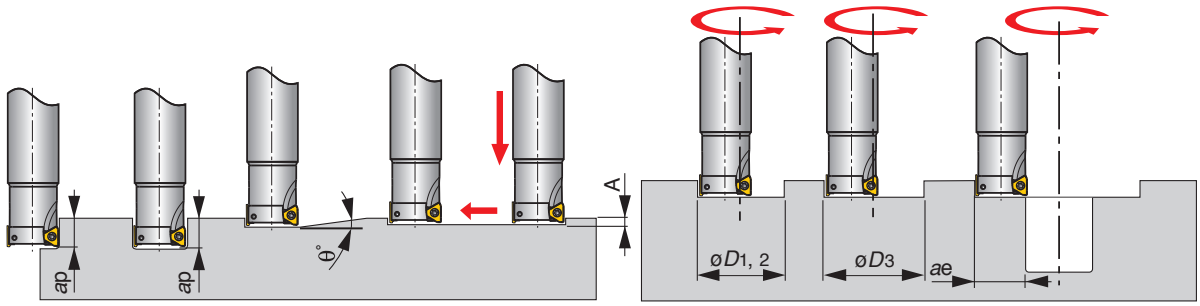
## STANDARD CUTTING CONDITIONS

### TLA (Roughing type)

| ISO | Workpiece material | Hardness | Grade | Cutting speed: *Vc* (m/min) | | Feed per tooth: *fz* (mm/t) | |
|---|---|---|---|---|---|---|---|
| | | | | TLA10 | TLA15 | TLA10 | TLA15 |
| P | Low carbon steel E275A, C15E4, etc. | - 200 HB | AH3135 | 100 - 250 | 100 - 250 | 0.08 - 0.18 | 0.08 - 0.22 |
| P | High carbon steel C45, etc. | 200 - 300 HB | AH3135 | 100 - 200 | 100 - 270 | 0.08 - 0.14 | 0.08 - 0.18 |
| P | Alloy steel 42CrMo4, etc. | 200 - 300 HB | AH3135 | 100 - 150 | 100 - 180 | 0.08 - 0.14 | 0.08 - 0.18 |
| M | Stainless steel X5CrNi18-9, etc. | - | AH3135 | 80 - 200 | 90 - 200 | 0.08 - 0.15 | 0.08 - 0.18 |
| K | Grey cast iron 250, etc. | 150 - 250 HB | AH120<br>T1215 | 100 - 250<br>150 - 250 | 140 - 250<br>150 - 250 | 0.10 - 0.18 | 0.08 - 0.22 |
| K | Ductile cast iron 450-10S, etc. | 150 - 250 HB | AH120<br>T1215 | 80 - 200<br>150 - 250 | 110 - 200<br>150 - 250 | 0.10 - 0.18 | 0.08 - 0.22 |
| S | Titanium alloys Ti-6Al-4V, etc. | - | AH120 | 20 - 60 | 20 - 60 | 0.00 - 0.14 | 0.06 - 0.15 |
| S | Heat-resistant alloys Inconel 718, etc. | - | AH120 | 20 - 40 | 20 - 40 | 0.05 - 0.12 | 0.06 - 0.13 |

Note: When you use the NMJ chipbreaker, please set up the feed less than 0.15 mm/t.

# APPLICATION RANGE




| Designation | Tool dia. øDc | Max. depth of cut ap | Max. ramping angle θ° | Max. plunging depth A | Min. machining depth øD1 | Max. machining diameter øD2 | Max. machining diameter øD3 * | Max. cutting width in enlarging ae |
|---|---|---|---|---|---|---|---|---|
| EPA06R012… | 12 | 6 | 5 | 0.6 | 18 | 23.6 | 21 | 11.5 |
| E/HPA06R016… | 16 | 6 | 4.3 | 0.6 | 25 | 31.6 | 29 | 15.5 |
| EPA06R018… | 18 | 6 | 3.5 | 0.6 | 29.5 | 35.6 | 33 | 17.5 |
| E/HPA06R020… | 20 | 6 | 2.8 | 0.6 | 33.5 | 39.6 | 37 | 19.5 |
| EPA06R022… | 22 | 6 | 2.5 | 0.6 | 37.5 | 43.6 | 41 | 21.5 |
| E/HPA06R025… | 25 | 6 | 2 | 0.6 | 43.5 | 49.6 | 47 | 24.5 |
| E/HPA10R025… | 25 | 10 | 2 | 0.6 | 42.1 | 49.6 | 47 | 24.5 |
| EPA06R028… | 28 | 6 | 1.8 | 0.6 | 49.5 | 55.6 | 53 | 27.5 |
| EPA10R028… | 28 | 10 | 2 | 0.6 | 48.1 | 55.6 | 53 | 27.5 |
| H/TPA06R032… | 32 | 6 | 1.5 | 0.6 | 57.5 | 63.6 | 61 | 31.5 |
| E/HPA10R032… | 32 | 10 | 2 | 0.6 | 56.1 | 63.6 | 61 | 31.5 |
| EPA10R035… | 35 | 10 | 1.7 | 0.6 | 62.1 | 69.6 | 67 | 34.5 |
| TPA06R040… | 40 | 6 | 1 | 0.6 | 73.5 | 79.6 | 77 | 39.5 |
| E/TPA10R040… | 40 | 10 | 1.4 | 0.6 | 72.1 | 79.6 | 77 | 39.5 |
| EPA15R040… | 40 | 15 | 2.3 | 0.8 | 68.5 | 79.2 | 75.5 | 39 |
| TPA06R050… | 50 | 6 | 0.7 | 0.6 | 94 | 99.6 | 97 | 49.5 |
| TPA10R050… | 50 | 10 | 0.9 | 0.6 | 92.1 | 99.6 | 97 | 49.5 |
| E/TPA15R050… | 50 | 15 | 1.7 | 0.8 | 88.5 | 99.2 | 95.5 | 49 |
| TPA10R063… | 63 | 10 | 0.8 | 0.6 | 118.1 | 125.6 | 123 | 62.5 |
| TPA15R063… | 63 | 15 | 1.4 | 0.8 | 114.5 | 125.2 | 121.5 | 62 |
| TPA10R080… | 80 | 10 | 0.6 | 0.6 | 152.1 | 159.6 | 157 | 79.5 |
| TPA15R080… | 80 | 15 | 1 | 0.8 | 148.5 | 159.2 | 155.5 | 79 |
| TPA10R100… | 100 | 10 | 0.5 | 0.6 | 192.1 | 199.6 | 197 | 99.5 |
| TPA15R100… | 100 | 15 | 0.8 | 0.8 | 188.5 | 199.2 | 195.5 | 99 |
| TPA15R125… | 125 | 15 | 0.6 | 0.8 | 238.5 | 249.2 | 245.5 | 124 |
| TPA15R160… | 160 | 15 | 0.5 | 0.8 | 308.5 | 319.2 | 315.5 | 159 |

*Flat bottom hole

Note: Corner *r*ε for dimensions of ø*D*1, ø*D*2 and ø*D*3: *r*ε = 0.4 for E/TPA06, E/TPA10 and *r*ε = 0.8 for E/TPA15.

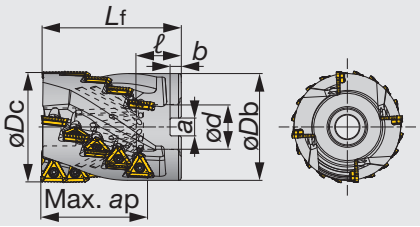
# TUNG-TRISHRED

## LPTC16

Square shoulder milling cutters for roughing with shred insert

A.R. = +5.5°~ +6.5°, R.R. = -11.5°~ -11.3°






| Designation | Max. ap | øDc | Z eff | z | øDb | Lf | ød | ℓ | a | b | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LPTC16M063B27.0L061R03 | 61 | 63 | 3 | 12 | 59 | 85 | 27 | 22 | 12.4 | 7 | 1.24 | TC*T16... |
| LPTC16M080B32.0L076R04 | 76 | 80 | 4 | 20 | 76 | 100 | 32 | 25 | 14.4 | 8 | 2.46 | TC*T16... |

### SPARE PARTS

| Designation | Clamping screw | Grip | Lubricant | Shell locking bolt | Torx bit |
|---|---|---|---|---|---|
| LPTC16M063B27.0L061R03 | TS 40B100I | H-TB2W | M-1000 | CAP-CM12X1.75X50 | BT15S |
| LPTC16M080B32.0L076R04 | TS 40B100I | H-TB2W | M-1000 | CM16X75 | BT15S |

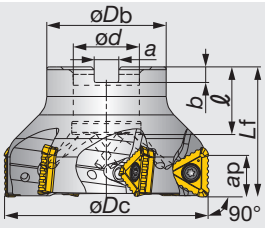
# TUNG-TRISHRED

## TPTC16

Square shoulder milling cutters with shred insert

A.R. = +5.5°~ +6.5°, R.R. = -11.5°~ -11.3°






| Designation | Max. ap | øDc | z | øDb | Lf | ød | ℓ | a | b | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TPTC16M050B22.0R04 | 16 | 50 | 4 | 41 | 40 | 22 | 20 | 10.4 | 6.3 | 0.29 | TC*T16... |
| TPTC16M063B22.0R05 | 16 | 63 | 5 | 41 | 40 | 22 | 20 | 10.4 | 6.3 | 0.44 | TC*T16... |
| TPTC16M080B27.0R06 | 16 | 80 | 6 | 50 | 50 | 27 | 22 | 12.4 | 7 | 0.9 | TC*T16... |
| TPTC16M100B32.0R07 | 16 | 100 | 7 | 60 | 50 | 32 | 28.5 | 14.4 | 8 | 1.35 | TC*T16... |

### SPARE PARTS

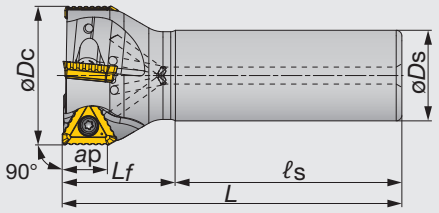
| Designation | Clamping screw | Grip | Lubricant | Shell locking bolt | Shell locking bolt 1 | Torx bit |
|---|---|---|---|---|---|---|
| TPTC16M050B22.0R04 | TS 40B100I | H-TB2W | M-1000 | - | FSHM10-40H | BT15S |
| TPTC16M063B22.0R05 | TS 40B100I | H-TB2W | M-1000 | - | CM10X30H | BT15S |
| TPTC16M080B27.0R06 | TS 40B100I | H-TB2W | M-1000 | - | CM12X30H | BT15S |
| TPTC16M100B32.0R07 | TS 40B100I | H-TB2W | M-1000 | TMBA-M16H | - | BT15S |

# EPTC16

## Square Shoulder milling cutters with shred insert

A.R. = +5.5°~ +6.5°, R.R. = -11.5°~ -11.3°






| Designation | Max. *ap* | *øDc* | z | *øDs* | *ℓs* | *Lf* | *L* | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|
| EPTC16M050C32.0R04 | 16 | 50 | 4 | 32 | 80 | 40 | 120 | 0.8 | TC*T16... |
| EPTC16M050C42.0R02L | 16 | 50 | 2 | 42 | 310 | 50 | 360 | 3.8 | TC*T16... |

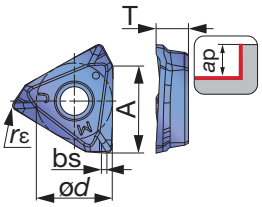
### SPARE PARTS

| Designation | Clamping screw | Grip | Lubricant | Torx bit |
|---|---|---|---|---|
| EPTC16... | TS 40B100I | H-TB2W | M-1000 | BT15S |

## INSERT

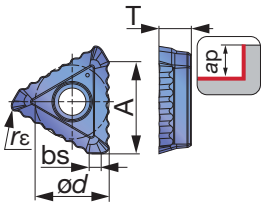
### TCGT-MJ






### TCMT-NMJ






| | | | |
|---|---|---|---|
| P | Steel | ☆ | ★ |
| M | Stainless | | ★ |
| K | Cast iron | ★ | |
| N | Non-ferrous | | |
| S | Superalloys | ★ | ☆ |
| H | Hard materials | | |

★ : First choice
☆ : Second choice

| Designation | *rε* | Max. ap | Coating AH120 | Coating AH3135 | A | *ød* | T | bs |
|---|---|---|---|---|---|---|---|---|
| TCGT160608PDER-MJ | 0.8 | 16 | ● | ● | 16 | 13.7 | 5.8 | 1 |
| TCMT160620PDER-NMJ | 2 | 16 | ● | ● | 16 | 13.3 | 5.8 | 2 |

●: Line-up

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Hardness | Priority | Grade | Chip-breaker | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) |
|---|---|---|---|---|---|---|---|
| P | Low carbon steel C15, C20, etc. | - 300 HB | First choice | AH3135 | NMJ* | 100 - 250 | 0.08 - 0.15 |
| | | - 300 HB | For finishing | AH3135 | MJ | 100 - 250 | 0.08 - 0.2 |
| | Carbon steel and alloy steel C55, 42CrMo4, etc. | - 300 HB | First choice | AH3135 | NMJ* | 100 - 230 | 0.08 - 015 |
| | | - 300 HB | For finishing | AH3135 | MJ | 100 - 230 | 0.08 - 0.2 |
| | Prehardened steel NAK80, PX5, etc. | 30 - 40 HRC | First choice | AH3135 | NMJ* | 100 - 180 | 0.08 - 0.15 |
| | | 30 - 40 HRC | For finishing | AH3135 | MJ | 100 - 180 | 0.08 - 0.2 |
| M | Stainless steel X5CrNi18-9, X5CrNiMo17-12-3, etc. | - | First choice | AH3135 | NMJ* | 90 - 200 | 0.08 - 0.15 |
| | | - | For finishing | AH3135 | MJ | 90 - 200 | 0.08 - 0.2 |
| K | Grey cast iron 250, 300, etc. | 150 - 250 HB | First choice | AH120 | NMJ* | 140 - 250 | 0.08 - 0.15 |
| | | 150 - 250 HB | For finishing | AH120 | MJ | 140 - 250 | 0.08 - 0.25 |
| | Ductile cast iron 400-15,600-3, etc. | 150 - 250 HB | First choice | AH120 | NMJ* | 140 - 250 | 0.08 - 0.15 |
| | | 150 - 250 HB | For finishing | AH120 | MJ | 140 - 250 | 0.08 - 0.25 |
| S | Titanium alloys Ti-6Al-4V, etc. | - | First choice | AH120 | NMJ* | 20 - 60 | 0.08 - 0.15 |
| | | - | For finishing | AH120 | MJ | 20 - 60 | 0.08 - 0.18 |
| | Heat-resistant alloys Inconel718, etc. | - | First choice | AH120 | NMJ* | 20 - 40 | 0.08 - 0.13 |
| | | - | For finishing | AH120 | MJ | 20 - 40 | 0.08 - 0.15 |

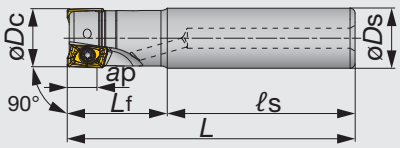
* When you use the NMJ chipbreaker, please set up the feed less than 0.15 mm/t.

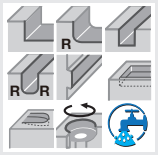
## EPAV06

### Square shoulder milling endmills in small diameter

A.R. = +6.0°~ +7.6°, R.R. = -37.1°~ -32.4°





| Designation | Max. *ap* | ø*D*c | z | ø*D*s | *ℓ*s | *L*f | *L* | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|
| EPAV06M008C10.0R01 | 6 | 8 | 1 | 10 | 60 | 20 | 80 | 0.04 | AVGT06... |
| EPAV06M010C10.0R02 | 6 | 10 | 2 | 10 | 60 | 20 | 80 | 0.04 | AVGT06... |
| EPAV06M010C10.0R02L | 6 | 10 | 2 | 10 | 65 | 35 | 100 | 0.06 | AVGT06... |
| EPAV06M012C12.0R02 | 6 | 12 | 2 | 12 | 60 | 20 | 80 | 0.06 | AVGT06... |
| EPAV06M012C12.0R03 | 6 | 12 | 3 | 12 | 60 | 20 | 80 | 0.06 | AVGT06... |
| EPAV06M012C12.0R02L | 6 | 12 | 2 | 12 | 85 | 35 | 120 | 0.09 | AVGT06... |
| EPAV06M016C16.0R03 | 6 | 16 | 3 | 16 | 70 | 20 | 90 | 0.12 | AVGT06... |
| EPAV06M016C16.0R04 | 6 | 16 | 4 | 16 | 70 | 20 | 90 | 0.12 | AVGT06... |
| EPAV06M016C16.0R03L | 6 | 16 | 3 | 16 | 105 | 35 | 140 | 0.2 | AVGT06... |

**SPARE PARTS**





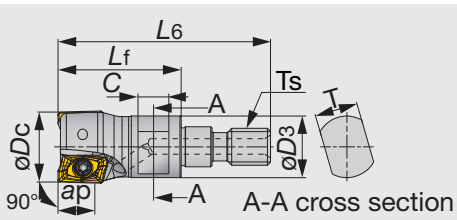
| Designation | Clamping screw | Lubricant | Wrench |
|---|---|---|---|
| EPAV06M... | CSPB-2H | M-1000 | IP-6DB |

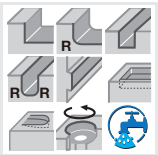
## HPAV06-M

### Square shoulder milling endmills in small diameter; Modular head with TungFlex threaded adaptation

A.R. = +6.0°~ +7.6°, R.R. = -37.1°~ -32.4°





| Designation | Max. *ap* | ø*D*c | z | *L*6 | *L*f | C | T | ø*D*3 | Ts | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| HPAV06M010M06R02 | 6 | 10 | 2 | 34.5 | 20 | 5 | 7 | 9.5 | M6 | 0.01 | AVGT06... |
| HPAV06M012M06R02 | 6 | 12 | 2 | 34.5 | 20 | 5 | 7 | 10 | M6 | 0.01 | AVGT06... |
| HPAV06M012M06R03 | 6 | 12 | 3 | 34.5 | 20 | 5 | 7 | 10 | M6 | 0.01 | AVGT06... |
| HPAV06M016M08R03 | 6 | 16 | 3 | 42 | 25 | 8 | 10 | 13 | M8 | 0.03 | AVGT06... |
| HPAV06M016M08R04 | 6 | 16 | 4 | 42 | 25 | 8 | 10 | 13 | M8 | 0.03 | AVGT06... |

**SPARE PARTS**





| Designation | Clamping screw | Lubricant | Wrench |
|---|---|---|---|
| HPAV06M... | CSPB-2H | M-1000 | IP-6DB |

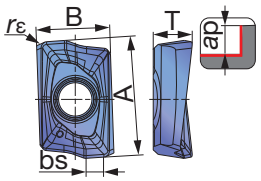
## INSERT

AVGT-MJ



AVGT-AJ






| | | | |
|---|---|---|---|
| P | Steel | ★ | ★ |
| M | Stainless | | ★ |
| K | Cast iron | ★ | |
| N | Non-ferrous | | |
| S | Superalloys | ★ | ☆ |
| H | Hard materials | ★ | |

★ : First choice
☆ : Second choice

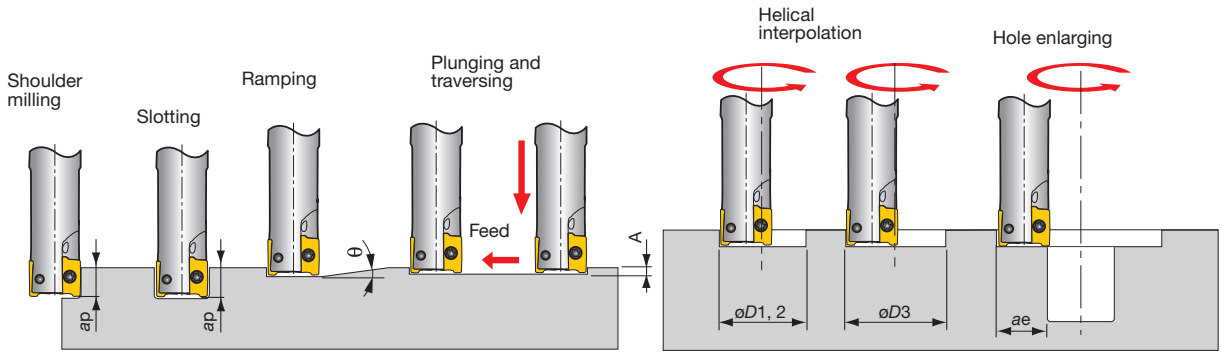
| Designation | rε | Max. ap | Coating AH120 | Coating AH3135 | Un-coated KS05F | A | B | T | bs |
|---|---|---|---|---|---|---|---|---|---|
| AVGT060302PBER-MJ | 0.2 | 6 | ● | ● | | 8 | 5 | 2.7 | 1.5 |
| AVGT060304PBER-MJ | 0.4 | 6 | ● | ● | | 8 | 5 | 2.7 | 1.3 |
| AVGT060308PBER-MJ | 0.8 | 6 | ● | ● | | 8 | 5 | 2.6 | 0.9 |
| AVGT060302PBFR-AJ | 0.2 | 6 | | | ● | 8 | 5 | 2.7 | 1.5 |
| AVGT060304PBFR-AJ | 0.4 | 6 | | | ● | 8 | 5 | 2.7 | 1.3 |
| AVGT060308PBFR-AJ | 0.8 | 6 | | | ● | 8 | 5 | 2.6 | 0.9 |

●: Line-up

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | | Hardness | Priority | Grade | Chip-breaker | Cutting speed Vc (m/min) | Feed per tooth fz (mm/t) |
|---|---|---|---|---|---|---|---|---|
| P | Low carbon steel C15E4, E275A, etc. | | - 300 HB | First choice | AH3135 | MJ | 230 - 430 | 0.07 - 0.12 |
| P | Carbon steel and alloy steel C55, 42CrMo4, etc. | | - 300 HB | First choice | AH3135 | MJ | 150 - 350 | 0.07 - 0.12 |
| P | Prehardened steel NAK80, PX5, etc. | | 30 - 40 HRC | First choice | AH120 | MJ | 100 - 230 | 0.07 - 0.12 |
| M | Stainless steel X5CrNi18-9, X5CrNiMo17-12-3, etc. | | - | First choice | AH3135 | MJ | 150 - 220 | 0.06 - 0.1 |
| K | Grey cast iron 250, 300, etc. | | 150 - 250 HB | First choice | AH120 | MJ | 200 - 330 | 0.07 - 0.12 |
| K | Ductile cast iron 600-3, etc. | | 150 - 250 HB | First choice | AH120 | MJ | 150 - 240 | 0.07 - 0.12 |
| N | Aluminium alloys Si < 13% | | - | First choice | KS05F | AJ | 650 - 1000 | 0.07 - 0.12 |
| S | Titanium alloys Ti-6Al-4V, etc. | | - | First choice | AH120 | MJ | 70 - 90 | 0.06 - 0.1 |
| S | Superalloys nconel718, etc. | | - | First choice | AH120 | MJ | 45 - 65 | 0.06 - 0.09 |
| H | Hardened steel | X40CrMoV5-1, etc. | 40 - 50 HRC | First choice | AH120 | MJ | 45 - 70 | 0.05 - 0.08 |
| H | Hardened steel | X153CrMoV12, etc. | 50 - 60 HRC | First choice | AH120 | MJ | 40 - 65 | 0.04 - 0.06 |

## APPLICATION RANGE




| Designation | Tool dia. øDc | Max. depth of cut ap | Max. ramping angle θ | Max. plunging depth A | Min. machining øD1 | Max. machining øD2 | Max. machining øD3* | Max. cutting width in enlarging ae |
|---|---|---|---|---|---|---|---|---|
| EPAV06_008… | 8 | 6 | - | - | - | - | - | - |
| EPAV/HPAV06_010… | 10 | 6 | 3° | 0.3 | 15 | 19 | 18 | 9.5 |
| EPAV/HPAV06_012… | 12 | 6 | 3° | 0.5 | 18 | 23 | 22 | 11.5 |
| EPAV/HPAV06_016… | 16 | 6 | 2.5° | 0.6 | 25 | 31 | 30 | 15.5 |

*Flat bottom hole

MEMO

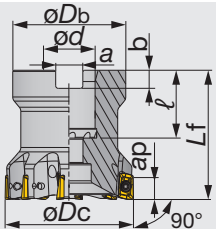
TUNGREC

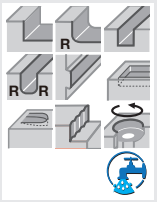
## TPO07

High precision shoulder square mills with AOMT/AOGT07 inserts

A.R. = +7°, R.R. = +13°~ +18°





| Designation | øDc | z | øDb | Lf | ød | ℓ | a | b | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TPO07R032M16.0E08 | 32 | 8 | 30 | 40 | 16 | 21 | 8.4 | 5.6 | 0.1 | with | AO*T0702... |
| TPO07R040M16.0E10 | 40 | 10 | 35 | 40 | 16 | 21 | 8.4 | 5.6 | 0.2 | with | AO*T0702... |
| TPO07R050M22.0E12 | 50 | 12 | 41 | 40 | 22 | 22 | 10.4 | 6.3 | 0.3 | with | AO*T0702... |

### SPARE PARTS

| Designation | Clamping screw | Shell locking bolt | Wrench |
|---|---|---|---|
| TPO07R032, 040... | CSTB-2.5L046 | CM8X30H | T-7DB |
| TPO07R050M22.0E12 | CSTB-2.5L046 | CM10X30H | T-7DB |

TUNGREC

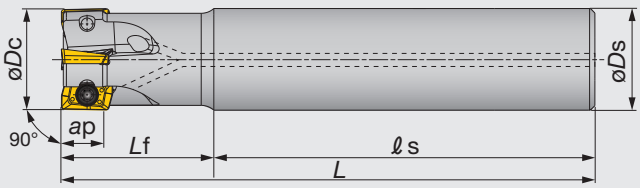
## EPO07

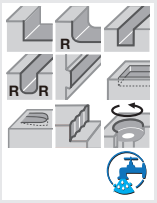
High precision shoulder square endmills with AOMT/AOGT07 inserts

A.R. = +7°, R.R. = +13°~ +18°







| Designation | øDc | z | øDs | ℓs | Lf | L | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|
| EPO07R012M12.0-02 | 12 | 2 | 12 | 50 | 18 | 68 | 0.1 | with | AO*T0702... |
| EPO07R012M12.0-02L | 12 | 2 | 12 | 95 | 30 | 125 | 0.1 | with | AO*T0702... |
| EPO07R016M12.0-02 | 16 | 2 | 12 | 50 | 20 | 70 | 0.1 | with | AO*T0702... |
| EPO07R016M16.0-02L | 16 | 2 | 16 | 105 | 40 | 145 | 0.2 | with | AO*T0702... |
| EPO07R016M16.0-04 | 16 | 4 | 16 | 60 | 24 | 84 | 0.1 | with | AO*T0702... |
| EPO07R018M16.0-02L | 18 | 2 | 16 | 105 | 40 | 145 | 0.2 | with | AO*T0702... |
| EPO07R018M16.0-04 | 18 | 4 | 16 | 60 | 24 | 84 | 0.1 | with | AO*T0702... |
| EPO07R020M16.0-03 | 20 | 3 | 16 | 60 | 30 | 90 | 0.1 | with | AO*T0702... |
| EPO07R020M20.0-03L | 20 | 3 | 20 | 135 | 50 | 185 | 0.4 | with | AO*T0702... |
| EPO07R020M20.0-05 | 20 | 5 | 20 | 70 | 30 | 100 | 0.2 | with | AO*T0702... |
| EPO07R022M20.0-03L | 22 | 3 | 20 | 135 | 50 | 185 | 0.4 | with | AO*T0702... |
| EPO07R022M20.0-05 | 22 | 5 | 20 | 70 | 30 | 100 | 0.2 | with | AO*T0702... |
| EPO07R025M20.0-03 | 25 | 3 | 20 | 60 | 35 | 95 | 0.3 | with | AO*T0702... |
| EPO07R025M25.0-03L | 25 | 3 | 25 | 150 | 70 | 220 | 0.7 | with | AO*T0702... |
| EPO07R025M25.0-07 | 25 | 7 | 25 | 80 | 35 | 115 | 0.4 | with | AO*T0702... |
| EPO07R028M25.0-03L | 28 | 3 | 25 | 150 | 70 | 220 | 0.7 | with | AO*T0702... |
| EPO07R028M25.0-07 | 28 | 7 | 25 | 80 | 35 | 115 | 0.4 | with | AO*T0702... |

*The *øDc* in the above table shows the diameter when MJ and AJ chipbreakers are used. When HJ chipbreaker is used, the tool diameter is equal to the above shown *øDc* + 0.6 mm.

**The *Lf* and *L* in the above table show the lengths when MJ chipbreaker is used. When AJ chipbreaker is used, the lengths are equal to *Lf*, *L* + 0.1 mm. When HJ chipbreaker is used, the lengths are equal to *Lf*, *L* + 0.5 mm.

### SPARE PARTS

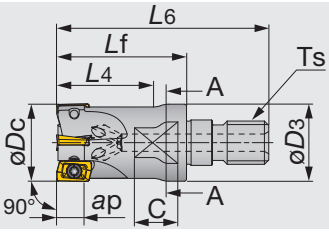
| Designation | Clamping screw | Wrench |
|---|---|---|
| EPO07R012... | SR-10503833-S | T-7DB |
| EPO07R016 - 028... | CSTB-2.5L046 | T-7DB |

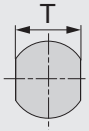
# HPO07-M

High precision shoulder square endmills (TungRec) with TungFlex, carrying AOMT/AOGT07 inserts

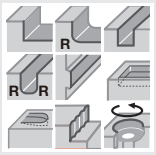
A.R. = +7°, R.R. = +13°~ +18°





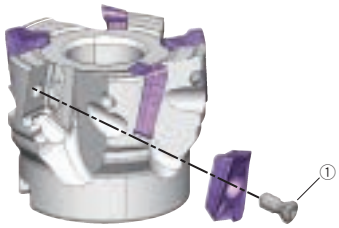

A-A cross section




| Designation | øDc | z | L6 | Lf | L4 | C | T | øD3 | Ts | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HPO07R012MM06-02 | 12 | 2 | 39.5 | 25 | - | 5 | 7 | 9.8 | M6 | 0.01 | with | AO*T0702... |
| HPO07R012MM08-02 | 12 | 2 | 42 | 25 | 20 | 8 | 10 | 12.8 | M8 | 0.02 | with | AO*T0702... |
| HPO07R016MM08-04 | 16 | 4 | 42 | 25 | - | 8 | 10 | 12.8 | M8 | 0.03 | with | AO*T0702... |
| HPO07R016MM10-04 | 16 | 4 | 49 | 30 | 20 | 10 | 15 | 17.8 | M10 | 0.05 | with | AO*T0702... |
| HPO07R020MM10-05 | 20 | 5 | 49 | 30 | - | 10 | 15 | 17.8 | M10 | 0.06 | with | AO*T0702... |
| HPO07R025MM12-07 | 25 | 7 | 57 | 35 | - | 10 | 17 | 20.8 | M12 | 0.1 | with | AO*T0702... |

## SPARE PARTS

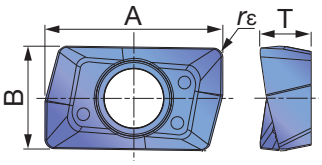
| Designation | ①Clamping screw | Lubricant | Wrench |
|---|---|---|---|
| HPO07R012MM0*-02 | SR-10503833-S | M-1000 | T-7DB |
| HPO07R016 - 025... | CSTB-2.5L046 | M-1000 | T-7DB |




## INSERT

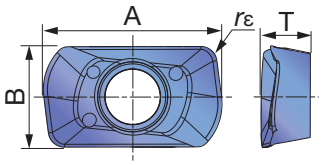
### AOMT07-MJ





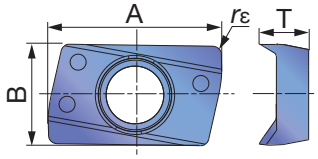

### AOMT07-HJ






### AOGT07-AJ






| | | Coating | | Un-coated |
|---|---|---|---|---|
| | | AH140 | AH725 | KS15F |
| P | Steel | | ★ | |
| M | Stainless | ★ | ☆ | |
| K | Cast iron | | ★ | |
| N | Non-ferrous | | | ★ |
| S | Superalloys | | ★ | |
| H | Hard materials | | | |

★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | AH140 | AH725 | KS15F | A | B | T |
|---|---|---|---|---|---|---|---|---|
| AOMT070202PDPR-MJ | 0.2 | 7 | ● | ● | | 8 | 4.7 | 2.3 |
| AOMT070204PDPR-MJ | 0.4 | 7 | ● | ● | | 8 | 4.7 | 2.3 |
| AOMT070208PDPR-MJ | 0.8 | 7 | ● | ● | | 8 | 4.7 | 2.3 |
| AOMT070216PDPR-MJ | 1.6 | 7 | ● | ● | | 8 | 4.7 | 2.3 |
| AOMT070208PDPR-HJ | 0.8 | 0.8 | ● | ● | | 8.8 | 4.9 | 2.4 |
| AOGT070204PDFR-AJ | 0.4 | 6.4 | | | ● | 8.1 | 4.7 | 2.3 |

●: Line-up

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Hardness HB | Grade | Cutting speed *Vc* (m/min) | Feed per tooth: *fz* (mm/t) MJ | HJ | AJ |
|---|---|---|---|---|---|---|---|
| P | Low carbon steel C15E4, etc. | < 200 | AH725 | 90 - 200 | 0.05 - 0.1 | 0.4 - 0.9 | - |
| P | High carbon steel and alloy steel C55, 42CrMo4, etc. | 200 - 300 | AH725 | 90 - 150 | 0.05 - 0.1 | 0.4 - 0.9 | - |
| P | Tool steel X153CrMoV12, etc. | 150 - 300 | AH725 | 80 - 120 | 0.05 - 0.1 | 0.4 - 0.9 | - |
| M | Stainless steel X5CrNi18-9, etc. | - | AH140 | 90 - 150 | 0.05 - 0.1 | 0.4 - 0.9 | - |
| K | Grey cast irons 250, etc. | 150 - 250 | AH725 | 100 - 180 | 0.05 - 0.1 | 0.4 - 0.9 | - |
| K | Ductile cast irons 450-10S, etc. | 150 - 250 | AH725 | 80 - 150 | 0.05 - 0.1 | 0.4 - 0.9 | - |
| N | Aluminium alloys Si < 13% | - | KS15F | 300 - 1000 | - | - | 0.08 - 0.2 |
| N | Aluminium alloys Si ≥ 13% | - | KS15F | 100 - 200 | - | - | 0.08 - 0.2 |
| S | Titanium alloys Ti-6Al-4V, etc. | - | AH725 | 20 - 50 | 0.05 - 0.1 | 0.4 - 0.9 | - |
| S | Superalloys Inconel 718, etc. | - | AH725 | 20 - 35 | 0.05 - 0.08 | 0.2 - 0.6 | - |

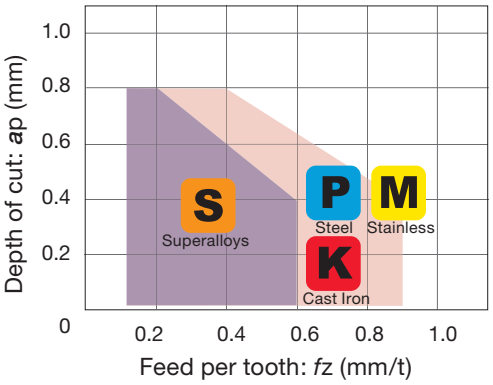
· To remove excessive chip accumulation use an air blast.
· To avoid build up edge on the cutting edges (aluminium machining), use a water soluble coolant.
· When cutting an interrupted surface or a casted skin, the feed per tooth (*fz*) should be reduced to the lower recommended value shown in the above table.
· Cutting conditions are limited by machine power, workpiece rigidity, and spindle output. When the cutting width, depth, or overhang length is large, set *Vc* and *fz* to the lower recommended values and check the machine power and vibration.

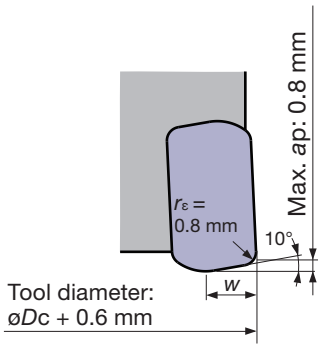


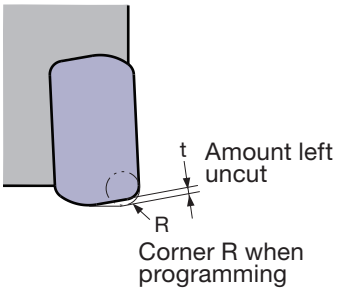
## CAUTIONARY POINTS WHEN USING HJ INSERTS

HJ type inserts are designed for high feed machining.
Please note the following when using HJ inserts:
1. The shape of HJ insert differs from that of other inserts (MJ, AJ). However the same insert pocket can be used.
2. When using HJ inserts, all the inserts on the cutter body must be HJ type. Do not use other types of inserts (MJ and AJ types) with HJ inserts on the same cutter body.
3. When using CAD/CAM, please program it as a radius cutter. The table below shows the corner R when programming and the uncut area (t).
4. With HJ inserts, the tool diameter increases by 0.6 mm over the diameter ø*D*c shown in the table.

### TungRec 07 type HJ inserts Standard conditions



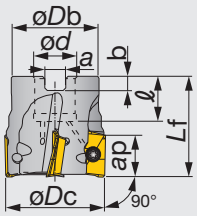

| Max. depth of cut max ap (mm) | Main cutting edge length *W* (mm) | Corner R when programming | Amount left uncut t (mm) |
|---|---|---|---|
| 0.8 | 3 | R 0.5 | 0.4 |
| | | R 1 | 0.3 |

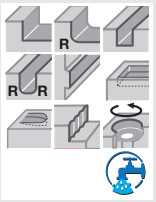
MEMO

## TUNGREC
### TPO11
High precision shoulder square mills with ASMT/ASGT11 inserts

A.R. = +8.7°~ +18°, R.R. = –5.3°~ –19.4°





| Designation | Max. ap | øDc | z | øDb | ød | ℓ | Lf | b | a | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TPO11R040M16.0E06 | 10.6 | 40 | 6 | 35 | 16 | 18 | 40 | 5.6 | 8.4 | 0.21 | with | AS*T11T3... |
| TPO11R050M22.0E07 | 10.6 | 50 | 7 | 45 | 22 | 20 | 40 | 6.3 | 10.4 | 0.35 | with | AS*T11T3... |
| TPO11R063M22.0E08 | 10.6 | 63 | 8 | 47 | 22 | 20 | 45 | 6.3 | 10.4 | 0.59 | with | AS*T11T3... |
| TPO11R080M27.0E10 | 10.6 | 80 | 10 | 58 | 27 | 22 | 50 | 7 | 12.4 | 1.05 | with | AS*T11T3... |
| TPO11R100M32.0E11 | 10.6 | 100 | 11 | 70 | 32 | 25 | 63 | 8 | 14.4 | 2.01 | with | AS*T11T3... |

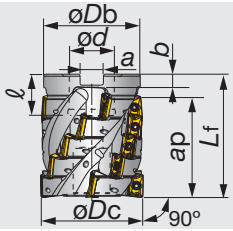
SPARE PARTS

| Designation | Clamping screw | Lubricant | Shell locking bolt | Wrench |
|---|---|---|---|---|
| TPO11R040M16.0E06 | CSPB-2.5 | M-1000 | CM8X30H | IP-8D |
| TPO11R050, 063... | CSPB-2.5 | M-1000 | CM10X30H | IP-8D |
| TPO11R080M27.0E10 | CSPB-2.5 | M-1000 | CM12X30H | IP-8D |
| TPO11R100M32.0E11 | CSPB-2.5 | M-1000 | CM16X40H | IP-8D |

## TUNGREC
### TLS11
Highly productive shoulder square mills for roughing with ASMT/ASGT11 inserts

A.R. = +8.7°~ +18°, R.R. = –5.3°~ –19.4°








| Designation | Max. ap | øDc | Z eff | z | øDb | Lf | ød | ℓ | a | b | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TLS11R050M22.0E04 | 48.8 | 50 | 4 | 20 | 47 | 60 | 22 | 20 | 10.4 | 6.3 | 0.5 | with | AS*T11T3... |

SPARE PARTS

| Designation | Clamping screw | Lubricant | Shell locking bolt | Wrench |
|---|---|---|---|---|
| TLS11R050M22.0E04 | CSPB-2.5 | M-1000 | CM10X40H | IP-8D |

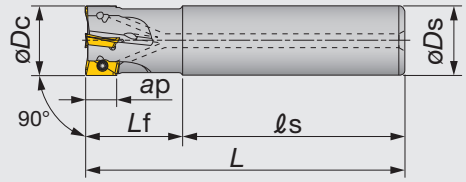
TUNGREC

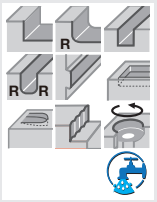
## EPO11

High precision shoulder square endmills with ASMT/ASGT11 inserts

A.R. = +8.7°~ +18°, R.R. = –5.3°~ –19.4°






| Designation | Max. ap | øDc | z | øDs | ℓs | Lf | L | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| EPO11R012M16.0-01 | 10.6 | 12 | 1 | 16 | 60 | 25 | 85 | 0.11 | with | AS*T11T3... |
| EPO11R012M16.0-01L | 10.6 | 12 | 1 | 16 | 95 | 30 | 125 | 0.16 | with | AS*T11T3... |
| EPO11R016M16.0-02 | 10.6 | 16 | 2 | 16 | 60 | 25 | 85 | 0.12 | with | AS*T11T3... |
| EPO11R016M16.0-02L | 10.6 | 16 | 2 | 16 | 105 | 40 | 145 | 0.2 | with | AS*T11T3... |
| EPO11R018M16.0-02 | 10.6 | 18 | 2 | 16 | 60 | 25 | 85 | 0.12 | with | AS*T11T3... |
| EPO11R018M16.0-02L | 10.6 | 18 | 2 | 16 | 105 | 40 | 145 | 0.21 | with | AS*T11T3... |
| EPO11R020M20.0-02 | 10.6 | 20 | 2 | 20 | 70 | 30 | 100 | 0.22 | with | AS*T11T3... |
| EPO11R020M20.0-02L | 10.6 | 20 | 2 | 20 | 135 | 50 | 185 | 0.41 | with | AS*T11T3... |
| EPO11R020M20.0-03 | 10.6 | 20 | 3 | 20 | 70 | 30 | 100 | 0.21 | with | AS*T11T3... |
| EPO11R022M20.0-02 | 10.6 | 22 | 2 | 20 | 70 | 30 | 100 | 0.22 | with | AS*T11T3... |
| EPO11R022M20.0-02L | 10.6 | 22 | 2 | 20 | 155 | 30 | 185 | 0.42 | with | AS*T11T3... |
| EPO11R022M20.0-03 | 10.6 | 22 | 3 | 20 | 70 | 30 | 100 | 0.22 | with | AS*T11T3... |
| EPO11R025M25.0-02L | 10.6 | 25 | 2 | 25 | 150 | 70 | 220 | 0.76 | with | AS*T11T3... |
| EPO11R025M25.0-03 | 10.6 | 25 | 3 | 25 | 80 | 35 | 115 | 0.39 | with | AS*T11T3... |
| EPO11R025M25.0-04 | 10.6 | 25 | 4 | 25 | 80 | 35 | 115 | 0.38 | with | AS*T11T3... |
| EPO11R028M25.0-02L | 10.6 | 28 | 2 | 25 | 185 | 35 | 220 | 0.8 | with | AS*T11T3... |
| EPO11R028M25.0-03 | 10.6 | 28 | 3 | 25 | 80 | 35 | 115 | 0.4 | with | AS*T11T3... |
| EPO11R028M25.0-04 | 10.6 | 28 | 4 | 25 | 80 | 35 | 115 | 0.39 | with | AS*T11T3... |
| EPO11R030M25.0-02L | 10.6 | 30 | 2 | 25 | 180 | 40 | 220 | 0.8 | with | AS*T11T3... |
| EPO11R030M25.0-03 | 10.6 | 30 | 3 | 25 | 80 | 40 | 120 | 0.43 | with | AS*T11T3... |
| EPO11R030M25.0-04 | 10.6 | 30 | 4 | 25 | 80 | 40 | 120 | 0.42 | with | AS*T11T3... |
| EPO11R032M32.0-02L | 10.6 | 32 | 2 | 32 | 175 | 80 | 255 | 1.48 | with | AS*T11T3... |
| EPO11R032M32.0-03 | 10.6 | 32 | 3 | 32 | 80 | 40 | 120 | 0.68 | with | AS*T11T3... |
| EPO11R032M32.0-05 | 10.6 | 32 | 5 | 32 | 80 | 40 | 120 | 0.67 | with | AS*T11T3... |
| EPO11R035M32.0-02L | 10.6 | 35 | 2 | 32 | 215 | 40 | 255 | 1.49 | with | AS*T11T3... |
| EPO11R035M32.0-03 | 10.6 | 35 | 3 | 32 | 80 | 40 | 120 | 0.69 | with | AS*T11T3... |
| EPO11R035M32.0-05 | 10.6 | 35 | 5 | 32 | 80 | 40 | 120 | 0.67 | with | AS*T11T3... |
| EPO11R040M32.0-02L | 10.6 | 40 | 2 | 32 | 205 | 50 | 255 | 1.53 | with | AS*T11T3... |
| EPO11R040M32.0-04 | 10.6 | 40 | 4 | 32 | 80 | 40 | 120 | 0.72 | with | AS*T11T3... |
| EPO11R040M32.0-06 | 10.6 | 40 | 6 | 32 | 80 | 40 | 120 | 0.71 | with | AS*T11T3... |
| EPO11R050M32.0-05 | 10.6 | 50 | 5 | 32 | 80 | 40 | 120 | 0.83 | with | AS*T11T3... |
| EPO11R050M32.0-07 | 10.6 | 50 | 7 | 32 | 80 | 40 | 120 | 0.82 | with | AS*T11T3... |
| EPO11R050M42.0-03L | 10.6 | 50 | 3 | 42 | 310 | 50 | 360 | 3.78 | with | AS*T11T3... |

### SPARE PARTS





| Designation | Clamping screw | Lubricant | Wrench |
|---|---|---|---|
| EPO11R012 - 022... | CSPB-2.5S | M-1000 | IP-8D |
| EPO11R025 - 050... | CSPB-2.5 | M-1000 | IP-8D |

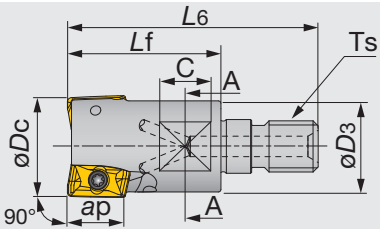
TUNGREC

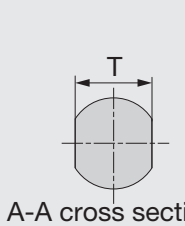
## HPO11-M

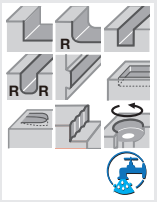
High precision shoulder square endmills (TungRec) with TungFlex, carrying ASMT/ASGT11 inserts

A.R. = +8.7° ~ +18°, R.R. = -5.3° ~ -19.4°






| Designation | Max. *ap* | ø*Dc* | z | *L*6 | *L*f | C | T | ø*D*3 | Ts | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HPO11R020MM10-02 | 10.6 | 20 | 2 | 49 | 30 | 10 | 15 | 17.8 | M10 | 0.06 | with | AS*T11T3... |
| HPO11R025MM12-03 | 10.6 | 25 | 3 | 57 | 35 | 10 | 17 | 20.8 | M12 | 0.1 | with | AS*T11T3... |
| HPO11R032MM16-03 | 10.6 | 32 | 3 | 63 | 40 | 12 | 22 | 28.8 | M16 | 0.2 | with | AS*T11T3... |

### SPARE PARTS

| Designation | Clamping screw | Lubricant | Wrench |
|---|---|---|---|
| HPO11R020MM10-02 | CSPB-2.5S | M-1000 | IP-8D |
| HPO11R025, 032... | CSPB-2.5 | M-1000 | IP-8D |

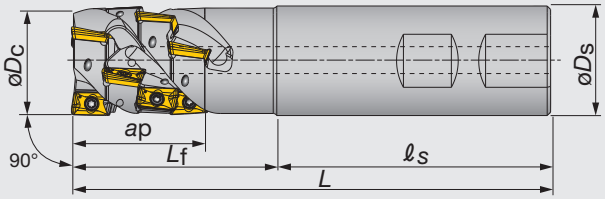
TUNGREC

## ELS11

Highly productive endmills for roughing with ASMT/ASGT11 inserts

A.R. = +8.7° ~ +18°, R.R. = -5.3° ~ -19.4°









| Designation | Max. *ap* | ø*Dc* | Z eff | z | ø*Ds* | ℓs | *L*f | *L* | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ELS11R025M25.0W02 | 30.4 | 25 | 2 | 6 | 25 | 80 | 40 | 120 | 0.4 | with | AS*T11T3... |
| ELS11R032M32.0W03 | 39.4 | 32 | 3 | 12 | 32 | 80 | 60 | 140 | 0.8 | with | AS*T11T3... |
| ELS11R040M42.0W03 | 40 | 40 | 3 | 12 | 42 | 90 | 60 | 150 | 1.4 | with | AS*T11T3... |

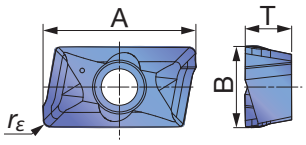
### SPARE PARTS

| Designation | Clamping screw | Lubricant | Wrench |
|---|---|---|---|
| ELS11... | CSPB-2.5 | M-1000 | IP-8D |

## INSERT

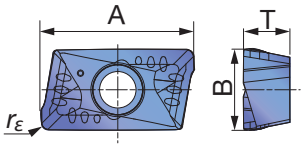
### ASMT11-MJ



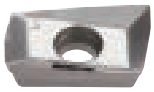


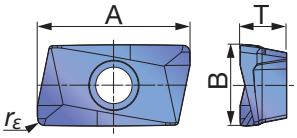

### ASMT11-MS






### ASGT11-AJ






| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ☆ | | | ★ | | | ★ | | ★ | | | | |
| M | Stainless | | ★ | ★ | ☆ | | | | | | | | | |
| K | Cast iron | ★ | | | ☆ | ☆ | ★ | | | | | | | |
| N | Non-ferrous | | | | | | | | ★ | | | ★ | | |
| S | Superalloys | ★ | ★ | | ★ | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | |

★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | Coating | | | | | | | | Cermet | | Un-coated | | A | B | T |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | AH120 | AH130 | AH140 | AH725 | T1115 | T1215 | T3130 | DS1100 | NS740 | | KS05F | | | | |
| ASMT11T304PDPR-MJ | 0.4 | 10.6 | ● | | | ● | ● | | ● | | ● | | | | 12.3 | 6.7 | 3.7 |
| ASMT11T308PDPR-MJ | 0.8 | 10.6 | ● | | | ● | ● | ● | ● | | ● | | | | 12.3 | 6.7 | 3.7 |
| ASMT11T312PDPR-MJ | 1.2 | 10.6 | ● | | | ● | | | ● | | | | | | 12.3 | 6.7 | 3.7 |
| ASMT11T316PDPR-MJ | 1.6 | 10.6 | ● | | | ● | | | ● | | ● | | | | 12.3 | 6.7 | 3.7 |
| ASMT11T320PDPR-MJ | 2 | 10.6 | ● | | | | | | | | | | | | 12.3 | 6.7 | 3.7 |
| ASMT11T330PDPR-MJ | 3 | 10.6 | ● | | | | | | | | | | | | 12.3 | 6.7 | 3.7 |
| ASMT11T304PDPR-MS | 0.4 | 10.6 | | ● | ● | | | | | | | | | | 12.3 | 6.7 | 3.7 |
| ASGT11T304PDFR-AJ | 0.4 | 10.6 | | | | | | | | ● | | | ● | | 12.3 | 6.7 | 3.7 |
| ASGT11T308PDFR-AJ | 0.8 | 10.6 | | | | | | | | ● | | | ● | | 12.3 | 6.7 | 3.7 |

●: Line-up

## STANDARD CUTTING CONDITIONS

### TPO11/EPO11/HPO11 type

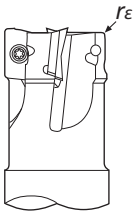
| ISO | Workpiece material | Brinell hardness HB | Priority | Grade | Cutting speed: *Vc* (m/min) | Feed per tooth: *fz* (mm/t) | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | MJ | MS | AJ |
| P | Low carbon steel C15E4, etc. | ~ 200 | First choice | AH725 | 100 - 250 | 0.1 - 0.2 | - | - |
| | | ~ 200 | For wear resistance | T3130 | 100 - 250 | 0.1 - 0.2 | - | - |
| | | ~ 200 | For surface appearance | NS740 | 100 - 250 | 0.05 - 0.15 | - | - |
| | High carbon steel and alloy steel C55, 42CrMo4, etc. | 200 ~ 300 | First choice | AH725 | 100 - 200 | 0.1 - 0.15 | - | - |
| | | 200 ~ 300 | For wear resistance | T3130 | 100 - 200 | 0.1 - 0.15 | - | - |
| | | 200 ~ 300 | For surface appearance | NS740 | 100 - 200 | 0.05 - 0.12 | - | - |
| | Tool steel X153CrMoV12, etc. | 150 ~ 300 | First choice | AH725 | 100 - 150 | 0.1 - 0.15 | - | - |
| | | 150 ~ 300 | For wear resistance | T3130 | 100 - 150 | 0.1 - 0.15 | - | - |
| M | Stainless steel X5CrNi18-9, etc. | - | - | AH130 | 80 - 200 | - | 0.08 - 0.2 | - |
| K | Grey cast irons 250, etc. | 150 ~ 250 | First choice | AH120 | 100 - 250 | 0.12 - 0.2 | - | - |
| | | 150 ~ 250 | For wear resistance | T1215 T1115 | 100 - 250 | 0.12 - 0.2 | - | - |
| | Ductile cast irons 450-10S, etc. | 150 ~ 250 | First choice | AH120 | 80 - 200 | 0.12 - 0.2 | - | - |
| | | 150 ~ 250 | For wear resistance | T1215 T1115 | 80 - 200 | 0.12 - 0.2 | - | - |
| N | Aluminium alloys Si < 13% | - | - | DS1100 | 300 - 1000 | - | - | 0.05 - 0.2 |
| | Aluminium alloys Si ≥ 13% | - | - | DS1100 | 100 - 200 | - | - | 0.05 - 0.2 |
| | Copper alloys | - | - | KS05F | 200 - 500 | - | - | 0.05 - 0.2 |
| S | Titanium alloys Ti-6Al-4V, etc. | - | - | AH130 | 20 - 60 | - | 0.08 - 0.15 | - |
| | Superalloys Inconel 718, etc. | - | - | AH725 | 20 - 40 | 0.08 - 0.13 | - | - |



## CAUTIONARY POINT IN MODIFYING CUTTER BODIES

When using inserts with corner radius $r_\varepsilon \geq$ 2.0 mm, standard cutter bodies have to be modified “R”. (Only for TPS11, EPS11, TLS11, ELS11, HPO11, EPO11)

- From 2nd row onwards, please use insert with $r_\varepsilon$ = 0.4 or 0.8 mm




| Corner radius $r_\varepsilon$ (mm) | The dimension of modifying (mm) |
|---|---|
| 0.4 ~ 1.6 | Unnecessary |
| 2.0 ~ 3.2 | 2 |

# STANDARD CUTTING CONDITIONS

## Roughing type TLS11 / ELS11

| ISO | Workpiece material | Brinell hardness HB | Priority | Grade | Cutting speed: *Vc* (m/min) | Feed per tooth: *fz* (mm/t) | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | MJ | MS | AJ |
| P | Low carbon steel C15E4, etc. | ~ 200 | First choice | AH725 | 100 - 250 | 0.10 - 0.18 | - | - |
| | | ~ 200 | For wear resistance | T3130 | 100 - 250 | 0.10 - 0.18 | - | - |
| | High carbon steel and alloy steel C55, 42CrMo4, etc. | 200 ~ 300 | First choice | AH725 | 100 - 200 | 0.08 - 0.14 | - | - |
| | | 200 ~ 300 | For wear resistance | T3130 | 100 - 200 | 0.08 - 0.14 | - | - |
| | Tool steel X153CrMoV12, etc. | 150 ~ 300 | First choice | AH725 | 100 - 200 | 0.08 - 0.14 | - | - |
| | | 150 ~ 300 | For wear resistance | T3130 | 100 - 200 | 0.08 - 0.14 | - | - |
| M | Stainless steel X5CrNi18-9, etc. | - | - | AH130 | 100 - 150 | - | 0.08 - 0.15 | - |
| K | Grey cast irons 250, etc. | 150 ~ 250 | First choice | AH120 | 100 - 250 | 0.10 - 0.18 | - | - |
| | | 150 ~ 250 | For wear resistance | T1215 T1115 | 100 - 250 | 0.10 - 0.18 | - | - |
| | Ductile cast irons 450-10S, etc. | 150 ~ 250 | First choice | AH120 | 80 - 200 | 0.10 - 0.18 | - | - |
| | | 150 ~ 250 | For wear resistance | T1215 T1115 | 80 - 200 | 0.10 - 0.18 | - | - |
| N | Aluminium alloys Si < 13% | - | - | DS1100 | 200 - 500 | - | - | 0.05 - 0.18 |
| | Aluminium alloys Si ≥ 13% | - | - | DS1100 | 100 - 200 | - | - | 0.05 - 0.18 |
| S | Titanium alloys Ti-6Al-4V, etc. | - | - | AH130 | 20 - 60 | - | 0.08 - 0.14 | - |
| | Superalloys Inconel718, etc. | - | - | AH725 | 20 - 40 | 0.06 - 0.12 | - | - |

· To remove excessive chip accumulation use an air blast.
· To avoid build up edge on the cutting edges (aluminium machining), use a water soluble coolant.
· When cutting an interrupted surface or a casted skin, the feed per tooth (*fz*) should be reduced to the lower recommended value shown in the above table.
· Cutting conditions are limited by machine power, workpiece rigidity, and spindle output. When the cutting width, depth, or overhang length is large, set *Vc* and *fz* to the lower recommended values and check the machine power and vibration.

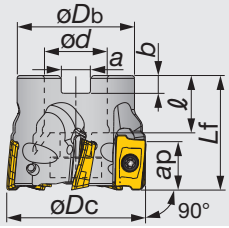
MEMO

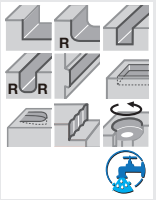
# TPO18

## High precision shoulder square milling cutters with AOMT/AOGT18 inserts

A.R. = +14° ~ +17°, R.R. = +22° ~ +31°






| Designation | Max. ap | øDc | z | øDb | Lf | ød | ℓ | a | b | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TPO18R040M16.0E04 | 16.7 | 40 | 4 | 35 | 40 | 16 | 18 | 8.4 | 5.6 | 0.2 | with | AO*T1805... |
| TPO18R050M22.0E05 | 16.7 | 50 | 5 | 41 | 40 | 22 | 20 | 10.4 | 6.3 | 0.3 | with | AO*T1805... |
| TPO18R063M22.0E06 | 16.7 | 63 | 6 | 41 | 40 | 22 | 20 | 10.4 | 6.3 | 0.5 | with | AO*T1805... |
| TPO18R080M27.0E07 | 16.7 | 80 | 7 | 50 | 50 | 27 | 22 | 12.4 | 70 | 10 | with | AO*T1805... |
| TPO18R100M32.0E08 | 16.7 | 100 | 8 | 60 | 50 | 32 | 28.5 | 14.4 | 80 | 1.4 | with | AO*T1805... |
| TPO18R125M40.0E09 | 16.7 | 125 | 9 | 71 | 63 | 40 | 32 | 16.4 | 90 | 2.8 | with | AO*T1805... |
| TPO18R160M40.0E10 | 16.7 | 160 | 10 | 100 | 63 | 40 | 29 | 16.4 | 90 | 4.9 | without | AO*T1805... |

### SPARE PARTS

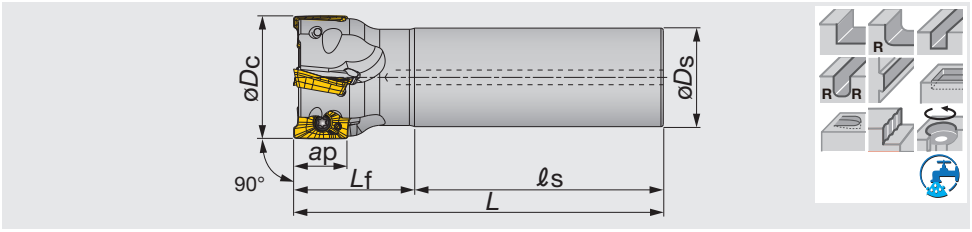
| Designation | Clamping screw | Grip | Shell locking bolt | Shell locking bolt 1 | Torx bit |
|---|---|---|---|---|---|
| TPO18R040M16.0E04 | CSTB-4L093 | H-TBS | - | FSHM8-30H | BT15M |
| TPO18R050M22.0E05 | CSTB-4L093 | H-TBS | - | CM10X30H | BT15M |
| TPO18R063M22.0E06 | CSTB-4L093 | H-TBS | - | CM10X30H | BT15M |
| TPO18R080M27.0E07 | CSTB-4L120 | H-TBS | - | CM12X30H | BT15M |
| TPO18R100M32.0E08 | CSTB-4L120 | H-TBS | TMBA-M16H | - | BT15M |
| TPO18R125M40.0E09 | CSTB-4L120 | H-TBS | TMBA-M20H | - | BT15M |
| TPO18R160M40.0E10 | CSTB-4L120 | H-TBS | - | - | BT15M |

# EPO18

## High precision shoulder square endmills with AOMT/AOGT18 inserts

A.R. = +14° ~ +17°, R.R. = +22° ~ +31°






| Designation | Max. *ap* | ø*Dc* | z | ø*Ds* | *ℓs* | *Lf* | *L* | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| EPO18R025M25.0-02 | 16.7 | 25 | 2 | 25 | 80 | 35 | 115 | 0.4 | with | AO*T1805... |
| EPO18R025M25.0-02L | 16.7 | 25 | 2 | 25 | 150 | 70 | 220 | 0.8 | with | AO*T1805... |
| EPO18R028M25.0-02 | 16.7 | 28 | 2 | 25 | 80 | 35 | 115 | 0.4 | with | AO*T1805... |
| EPO18R028M25.0-02L | 16.7 | 28 | 2 | 25 | 150 | 70 | 220 | 0.8 | with | AO*T1805... |
| EPO18R030M32.0-02 | 16.7 | 30 | 2 | 32 | 80 | 40 | 120 | 0.6 | with | AO*T1805... |
| EPO18R030M32.0-02L | 16.7 | 30 | 2 | 32 | 175 | 80 | 255 | 1.4 | with | AO*T1805... |
| EPO18R030M32.0-03 | 16.7 | 30 | 3 | 32 | 80 | 40 | 120 | 0.6 | with | AO*T1805... |
| EPO18R032M32.0-02 | 16.7 | 32 | 2 | 32 | 80 | 40 | 120 | 0.7 | with | AO*T1805... |
| EPO18R032M32.0-02L | 16.7 | 32 | 2 | 32 | 175 | 80 | 255 | 1.5 | with | AO*T1805... |
| EPO18R032M32.0-03 | 16.7 | 32 | 3 | 32 | 80 | 40 | 120 | 0.6 | with | AO*T1805... |
| EPO18R035M32.0-02 | 16.7 | 35 | 2 | 32 | 80 | 40 | 120 | 0.7 | with | AO*T1805... |
| EPO18R035M32.0-02L | 16.7 | 35 | 2 | 32 | 175 | 80 | 255 | 1.5 | with | AO*T1805... |
| EPO18R035M32.0-03 | 16.7 | 35 | 3 | 32 | 80 | 40 | 120 | 0.7 | with | AO*T1805... |
| EPO18R040M32.0-02L | 16.7 | 40 | 2 | 32 | 205 | 50 | 255 | 1.6 | with | AO*T1805... |
| EPO18R040M32.0-03 | 16.7 | 40 | 3 | 32 | 80 | 40 | 120 | 0.7 | with | AO*T1805... |
| EPO18R040M32.0-04 | 16.7 | 40 | 4 | 32 | 80 | 40 | 120 | 0.7 | with | AO*T1805... |
| EPO18R040M42.0-02L | 16.7 | 40 | 2 | 42 | 210 | 100 | 310 | 3 | with | AO*T1805... |
| EPO18R050M32.0-03 | 16.7 | 50 | 3 | 32 | 80 | 40 | 120 | 0.8 | with | AO*T1805... |
| EPO18R050M32.0-05 | 16.7 | 50 | 5 | 32 | 80 | 40 | 120 | 0.8 | with | AO*T1805... |
| EPO18R050M42.0-03L | 16.7 | 50 | 3 | 42 | 310 | 50 | 360 | 3.8 | with | AO*T1805... |
| EPO18R063M32.0-04 | 16.7 | 63 | 4 | 32 | 80 | 45 | 125 | 1 | with | AO*T1805... |
| EPO18R063M32.0-06 | 16.7 | 63 | 6 | 32 | 80 | 45 | 125 | 1.1 | with | AO*T1805... |
| EPO18R063M42.0-03L | 16.7 | 63 | 3 | 42 | 310 | 50 | 360 | 4 | with | AO*T1805... |

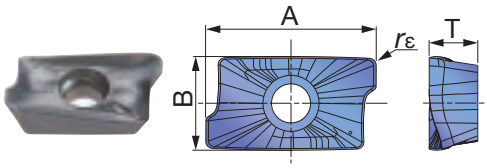
### SPARE PARTS



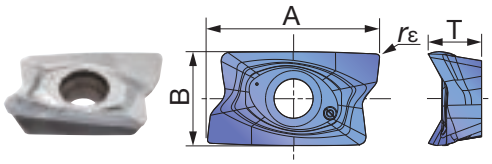

| Designation | Clamping screw | Wrench |
|---|---|---|
| EPO18R025 - 030... | CSTB-4L085 | T-15DB |
| EPO18R032 - 050... | CSTB-4L093 | T-15DB |
| EPO18R063M... | CSTB-4L120 | T-15DB |

## INSERT

### AOMT18-MJ




### AOGT18-AJ




| | | | | | | |
|---|---|---|---|---|---|---|
| P | Steel | | ★ | | | |
| M | Stainless | ★ | ☆ | | | |
| K | Cast iron | | ★ | | | |
| N | Non-ferrous | | | ★ | | |
| S | Superalloys | | ★ | | | |
| H | Hard materials | | | | | |

★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | Coating AH140 | Coating AH725 | Un-coated KS15F | A | B | T |
|---|---|---|---|---|---|---|---|---|
| AOMT180508PDPR-MJ | 0.8 | 16.7 | ● | ● | | 19.5 | 10.7 | 5.6 |
| AOMT180516PDPR-MJ | 1.6 | 16.7 | ● | ● | | 19.5 | 10.7 | 5.6 |
| AOMT180524PDPR-MJ | 2.4 | 16.7 | ● | ● | | 19.5 | 10.7 | 5.6 |
| AOMT180532PDPR-MJ | 3.2 | 16.7 | ● | ● | | 19.5 | 10.7 | 5.6 |
| AOGT180504PDFR-AJ | 0.4 | 16.7 | | | ● | 19.8 | 10.8 | 6.1 |
| AOGT180508PDFR-AJ | 0.8 | 16.7 | | | ● | 19.8 | 10.8 | 6.1 |

●: Line-up

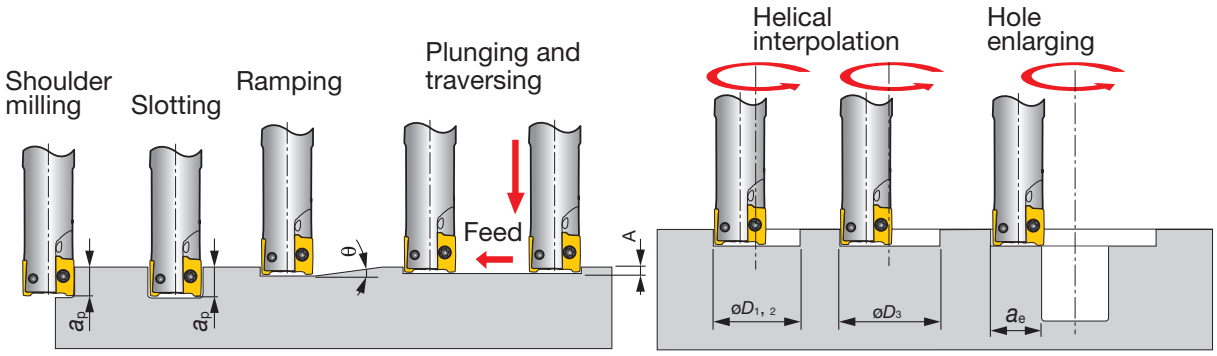
## STANDARD CUTTING CONDITIONS

### TPO18/EPO18 type

| ISO | Workpiece material | Brinell hardness HB | Grade | Cutting speed Vc (m/min) | Feed per tooth: fz (mm/t) MJ | Feed per tooth: fz (mm/t) AJ |
|---|---|---|---|---|---|---|
| P | Low carbon steel C15E4, etc. | ~ 200 | AH725 | 100 - 250 | 0.08 - 0.25 | - |
| P | High carbon steel and alloy steel C55, 42CrMo4, etc. | 200 ~ 300 | AH725 | 100 - 230 | 0.08 - 0.2 | - |
| P | Tool steel X153CrMoV12, etc. | 150 ~ 300 | AH725 | 100 - 180 | 0.08 - 0.2 | - |
| M | Stainless steel X5CrNi18-9, etc. | - | AH140 | 90 - 200 | 0.08 - 0.2 | - |
| K | Grey cast irons 250, etc. | 150 ~ 250 | AH725 | 140 - 250 | 0.08 - 0.25 | - |
| K | Ductile cast irons 450-10S, etc. | 150 ~ 250 | AH725 | 110 - 200 | 0.08 - 0.25 | - |
| N | Aluminium alloys Si < 13% | - | KS15F | 300 - 1000 | - | 0.05 - 0.25 |
| N | Aluminium alloys Si ≥ 13% | - | KS15F | 100 - 200 | - | 0.05 - 0.25 |
| S | Titanium alloys Ti-6Al-4V, etc. | - | AH725 | 20 - 60 | 0.08 - 0.18 | - |
| S | Superalloys Inconel718, etc. | - | AH725 | 20 - 40 | 0.08 - 0.15 | - |

· To remove excessive chip accumulation use an air blast.
· To avoid build up edge on the cutting edges (aluminium machining), use a water soluble coolant.
· When cutting an interrupted surface or a casted skin, the feed per tooth (fz) should be reduced to the lower recommended value shown in the above table.
· Cutting conditions are limited by machine power, workpiece rigidity, and spindle output. When the cutting width, depth, or overhang length is large, set Vc and fz to the lower recommended values and check the machine power and vibration.

# APPLICATION RANGE




| Designation | Tool dia. øDc | Chipbreaker | Max. depth of cut ap | Max. ramping angle θ° | Max. plunging depth A | Min. machining øD1 | Max. machining øD2 | Max. machining øD3* | Max. cutting width in enlarging ae |
|---|---|---|---|---|---|---|---|---|---|
| E/HPO07R012… | 12 | MJ | 7 | 8 | 0.5 | 16 | 23 | 20.5 | 11.5 |
| E/HPO07R016… | 16 | MJ | 7 | 5 | 0.5 | 24 | 31 | 28.5 | 15.5 |
| EPO07R018... | 18 | MJ | 7 | 4 | 0.5 | 28 | 35 | 32.5 | 17.5 |
| E/HPO07R020... | 20 | MJ | 7 | 3.5 | 0.5 | 32 | 39 | 36.5 | 19.5 |
| EPO07R022... | 22 | MJ | 7 | 3 | 0.5 | 36 | 43 | 40.5 | 21.5 |
| E/HPO07R025... | 25 | MJ | 7 | 2.5 | 0.5 | 42 | 49 | 46.5 | 24.5 |
| EPO07R028... | 28 | MJ | 7 | 2 | 0.5 | 48 | 55 | 52.5 | 27.5 |
| TPO07R032… | 32 | MJ | 7 | 1.8 | 0.5 | 56 | 63 | 60.5 | 31.5 |
| TPO07R040 | 40 | MJ | 7 | 1.2 | 0.5 | 72 | 79 | 76.5 | 39.5 |
| TPO07R050… | 50 | MJ | 7 | 0.9 | 0.5 | 92 | 99 | 96.5 | 49.5 |
| E/HPO07R012… | 12 | AJ | 6.4 | 8 | 0.5 | 16 | 23 | 20.5 | 11.5 |
| E/HPO07R016… | 16 | AJ | 6.4 | 5 | 0.5 | 24 | 31 | 28.5 | 15.5 |
| EPO07R018... | 18 | AJ | 6.4 | 4 | 0.5 | 28 | 35 | 32.5 | 17.5 |
| E/HPO07R020... | 20 | AJ | 6.4 | 3.5 | 0.5 | 32 | 39 | 36.5 | 19.5 |
| EPO07R022... | 22 | AJ | 6.4 | 3 | 0.5 | 36 | 43 | 40.5 | 21.5 |
| E/HPO07R025... | 25 | AJ | 6.4 | 2.5 | 0.5 | 42 | 49 | 46.5 | 24.5 |
| EPO07R028... | 28 | AJ | 6.4 | 2 | 0.5 | 48 | 55 | 52.5 | 27.5 |
| TPO07R032… | 32 | AJ | 6.4 | 1.8 | 0.5 | 56 | 63 | 60.5 | 31.5 |
| TPO07R040 | 40 | AJ | 6.4 | 1.2 | 0.5 | 72 | 79 | 76.5 | 39.5 |
| TPO07R050… | 50 | AJ | 6.4 | 0.9 | 0.5 | 92 | 99 | 96.5 | 49.5 |
| E/HPO07R012… | 12.6 | HJ | 0.8 | 5 | 0.5 | 17 | 24 | - | 9.6 |
| E/HPO07R016… | 16.6 | HJ | 0.8 | 3 | 0.5 | 25 | 32 | - | 13.6 |
| EPO07R018... | 18.6 | HJ | 0.8 | 2.5 | 0.5 | 29 | 36 | - | 15.6 |
| E/HPO07R020... | 20.6 | HJ | 0.8 | 2.1 | 0.5 | 33 | 40 | - | 17.6 |
| EPO07R022... | 22.6 | HJ | 0.8 | 1.9 | 0.5 | 37 | 44 | - | 19.6 |
| E/HPO07R025... | 25.6 | HJ | 0.8 | 1.6 | 0.5 | 43 | 50 | - | 22.6 |
| EPO07R028... | 28.6 | HJ | 0.8 | 1.3 | 0.5 | 49 | 56 | - | 25.6 |
| TPO07R032… | 32.6 | HJ | 0.8 | 1.1 | 0.5 | 57 | 64 | - | 29.6 |
| TPO07R040 | 40.6 | HJ | 0.8 | 0.8 | 0.5 | 73 | 80 | - | 37.6 |
| TPO07R050… | 50.6 | HJ | 0.8 | 0.6 | 0.5 | 93 | 100 | - | 47.6 |
| EPO11R012… | 12 | MJ, MS, AJ | 10.6 | 6 | 0.5 | 15 | 23 | 21 | 11.5 |
| EPO11R016… | 16 | MJ, MS, AJ | 10.6 | 5 | 0.5 | 20 | 31 | 29 | 15.5 |
| EPO11R018… | 18 | MJ, MS, AJ | 10.6 | 4 | 0.5 | 26 | 35 | 33 | 17.5 |
| E/HPO11R020… | 20 | MJ, MS, AJ | 10.6 | 3 | 0.5 | 28 | 39 | 37 | 19.5 |
| EPO11R022... | 22 | MJ, MS, AJ | 10.6 | 2.5 | 0.5 | 31 | 43 | 41 | 21.5 |

| Designation | Tool-ø | Chipbreaker | Max. depth of cut | Max. ramping angle | Max. plunging depth | Min. machining | Max. machining | | Max. cutting width in enlarging |
|---|---|---|---|---|---|---|---|---|---|
| | *ø*Dc | | *a*p | *θ*° | A | *ø*D1 | *ø*D2 | *ø*D3* | *a*e |
| E/HPO11R025… | 25 | MJ, MS, AJ | 10.6 | 2 | 0.5 | 38 | 49 | 47 | 24.5 |
| EPO11R028... | 28 | MJ, MS, AJ | 10.6 | 1.5 | 0.5 | 42 | 53 | 51 | 27.5 |
| EPO11R030… | 30 | MJ, MS, AJ | 10.6 | 1.5 | 0.5 | 48 | 55 | 53 | 29.5 |
| E/HPO11R032… | 32 | MJ, MS, AJ | 10.6 | 1.5 | 0.5 | 52 | 59 | 57 | 31.5 |
| EPO11R035… | 35 | MJ, MS, AJ | 10.6 | 1 | 0.5 | 56 | 67 | 65 | 34.5 |
| E/TPO11R040… | 40 | MJ, MS, AJ | 10.6 | 1 | 0.5 | 68 | 79 | 77 | 39.5 |
| TPO11R050… | 50 | MJ, MS, AJ | 10.6 | 0.7 | 0.5 | 68 | 99 | 97 | 49.5 |
| TPO11R063… | 63 | MJ, MS, AJ | 10.6 | 0.5 | 0.5 | 114 | 125 | 123 | 62.5 |
| TPO11R080… | 80 | MJ, MS, AJ | 10.6 | 0.4 | 0.5 | 148 | 159 | 157 | 79.5 |
| TPO11R100… | 100 | MJ, MS, AJ | 10.6 | 0.3 | 0.5 | 188 | 199 | 197 | 99.5 |
| EPO18R025... | 25 | MJ, AJ | 16.7 | 6 | 1 | 32 | 48 | 44 | 24 |
| EPO18R028... | 28 | MJ, AJ | 16.7 | 4.5 | 1 | 38 | 54 | 50 | 27 |
| EPO18R030… | 30 | MJ, AJ | 16.7 | 4 | 1 | 42 | 58 | 54 | 29 |
| EPO18R032… | 32 | MJ, AJ | 16.7 | 3.5 | 1 | 46 | 62 | 58 | 31 |
| EPO18R035… | 35 | MJ, AJ | 16.7 | 3 | 1 | 52 | 68 | 64 | 34 |
| E/TPO18R040… | 40 | MJ, AJ | 16.7 | 2.5 | 1 | 62 | 78 | 74 | 39 |
| E/TPO18R050… | 50 | MJ, AJ | 16.7 | 1.9 | 1 | 82 | 98 | 94 | 49 |
| E/TPO18R063 | 63 | MJ, AJ | 16.7 | 1.4 | 1 | 108 | 124 | 120 | 62 |
| TPO18R080… | 80 | MJ, AJ | 16.7 | 1 | 1 | 142 | 158 | 154 | 79 |
| TPO18R100… | 100 | MJ, AJ | 16.7 | 0.8 | 1 | 182 | 198 | 194 | 99 |
| TPO18R125… | 125 | MJ, AJ | 16.7 | 0.6 | 1 | 232 | 248 | 244 | 124 |
| TPO18R160… | 160 | MJ, AJ | 16.7 | 0.4 | 1 | 302 | 318 | 314 | 159 |

*Flat bottom hole

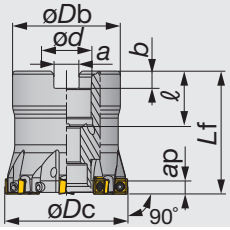
Note: Corner $r_\varepsilon$ for dimensions of *ø*$D_1$, *ø*$D_2$, and *ø*$D_3$: $r_\varepsilon$ = 0.4 for EPO07 / EPS11 and $r_\varepsilon$ = 0.8 for EPO18.

## TPD05

Highly dense shoulder square mills with small SDMT/SDHT05 inserts

A.R. = +5°, R.R. = -7° ~ +12°






Right hand (R) shown.

| Designation | Max. ap | øDc | z | øDb | Lf | ød | ℓ | a | b | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TPD05R032M16.0E06 | 4 | 32 | 6 | 30 | 32 | 16 | 20 | 8.4 | 5.6 | 0.1 | with | SD*T0502... |
| TPD05R040M22.0E08 | 4 | 40 | 8 | 38 | 40 | 22 | 22 | 10.4 | 6.3 | 0.2 | with | SD*T0502... |

### SPARE PARTS

| Designation | Clamping screw | Shell locking bolt | Wrench |
|---|---|---|---|
| TPD05R032M16.0E06 | CSPB-2L043 | CM8X30H | IP-6DB |
| TPD05R040M22.0E08 | CSPB-2L043 | CM10X30H | IP-6DB |

## EPD05

Highly dense shoulder square endmills with small SDMT/SDHT05 inserts

A.R. = +5°, R.R. = -7° ~ +12°



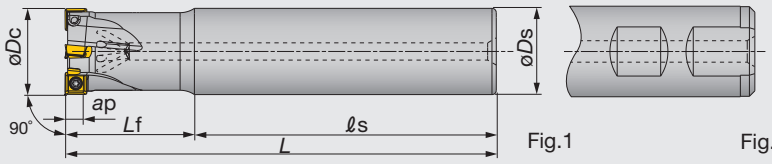



Fig.1 Fig.2

Right hand (R) shown.

| Designation | Max. ap | øDc | z | øDs | ℓs | Lf | L | Kg | Air hole | shank | Insert | shank type |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EPD05R012M12.0-02 | 4 | 12 | 2 | 12 | 62 | 18 | 80 | 0.1 | with | Straight | SD*T0502... | Fig.1 |
| EPD05R016M16.0-03 | 4 | 16 | 3 | 16 | 90 | 20 | 110 | 0.2 | with | Straight | SD*T0502... | Fig.1 |
| EPD05R020M20.0W04 | 4 | 20 | 4 | 20 | 80 | 25 | 105 | 0.2 | with | Weldon | SD*T0502... | Fig.2 |
| EPD05R025M20.0W05 | 4 | 25 | 5 | 20 | 90 | 25 | 115 | 0.3 | with | Weldon | SD*T0502... | Fig.2 |
| EPD05R032M25.0W06 | 4 | 32 | 6 | 25 | 98 | 32 | 130 | 0.5 | with | Weldon | SD*T0502... | Fig.2 |
| EPD05R040M32.0W08 | 4 | 40 | 8 | 32 | 100 | 40 | 140 | 0.8 | with | Weldon | SD*T0502... | Fig.2 |

### SPARE PARTS

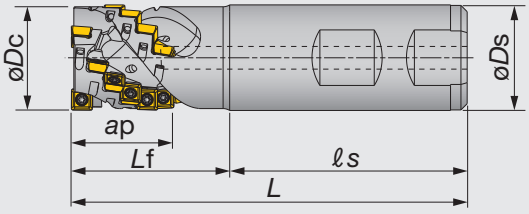
| Designation | Clamping screw | Wrench |
|---|---|---|
| EPD05... | CSPB-2L043 | IP-6DB |

## ELD05

Highly dense shoulder square endmills for roughing with small SDMT/SDHT05 inserts

A.R. = +5°, R.R. = -3°






| Designation | Max. ap | øDc | Z eff | z | øDs | ℓs | Lf | L | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ELD05R020M20.0W02 | 20.3 | 20 | 2 | 10 | 20 | 53 | 32 | 85 | 0.2 | with | SD*T0502... |
| ELD05R025M25.0W03 | 24.2 | 25 | 3 | 18 | 25 | 59 | 36 | 95 | 0.3 | with | SD*T0502... |

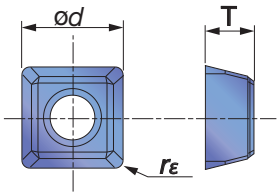
### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| ELD05... | CSPB-2L043 | IP-6DB |

## INSERT

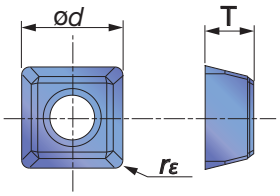
### SDMT05-MJ






### SDHT05-AJ






| | | | |
|---|---|---|---|
| P | Steel | | ★ |
| M | Stainless | ★ | ☆ |
| K | Cast iron | | ★ |
| N | Non-ferrous | | ★ |
| S | Superalloys | | ★ |
| H | Hard materials | | |

★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | Coating AH140 | Coating AH725 | Un-coated TH10 | T | ød |
|---|---|---|---|---|---|---|---|
| SDMT050204PN-MJ | 0.4 | 4 | ● | ● | | 2.38 | 5.09 |
| SDHT050204FN-AJ | 0.4 | 4 | | | ● | 2.39 | 5.09 |

●: Line-up

## STANDARD CUTTING CONDITIONS

### Bore, shank type TPD05/EPD05

| ISO | Workpiece material | Brinell hardness HB | Grade | Cutting speed Vc (m/min) | Feed per tooth fz (mm/t) |
|---|---|---|---|---|---|
| P | Low carbon steels C15E4, etc. | ~ 200 | AH725 | 230 - 320 | 0.04 - 0.1 |
| | High carbon steels C45, etc. | 200 ~ 300 | AH725 | 150 - 230 | 0.04 - 0.1 |
| | Alloyed steels 42CrMo4, etc. | 150 ~ 300 | AH725 | 150 - 230 | 0.04 - 0.1 |
| | Tool steels X153CrMoV12, etc. | ~ 300 | AH725 | 110 - 130 | 0.03 - 0.09 |
| M | Stainless steels X5CrNi18-9, etc. | - | AH140 | 100 - 200 | 0.03 - 0.09 |
| K | Grey cast irons 250, etc. | 150 ~ 250 | AH725 | 200 - 300 | 0.05 - 0.12 |
| | Ductile cast irons 450-10S, etc. | 150 ~ 250 | AH725 | 160 - 240 | 0.05 - 0.12 |
| N | Aluminium alloys Si < 13% | - | TH10 | 350 - 500 | 0.05 - 0.15 |
| | Aluminium alloys Si ≥ 13% | - | TH10 | 100 - 200 | 0.05 - 0.15 |

* For deep and wide cutting, set the *Vc* and *fz* to the lower recommended limits and check the vibration and spindle load of the machine.

## STANDARD CUTTING CONDITIONS

### Roughing type ELD05

| ISO | Workpiece material | Brinell hardness HB | Grade | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) |
|---|---|---|---|---|---|
| P | Low carbon steels C15E4, etc. | ~ 200 | AH725 | 100 - 250 | 0.04 - 0.1 |
| P | High carbon steels C45, etc. | 200 ~ 300 | AH725 | 100 - 200 | 0.04 - 0.1 |
| P | Alloyed steels 42CrMo4, etc. | 150 ~ 300 | AH725 | 100 - 200 | 0.04 - 0.1 |
| P | Tool steels X153CrMoV12, etc. | ~ 300 | AH725 | 100 - 130 | 0.03 - 0.09 |
| M | Stainless steels X5CrNi18-9, etc. | - | AH140 | 100 - 150 | 0.03 - 0.09 |
| K | Grey cast irons 250, etc. | 150 ~ 250 | AH725 | 100 - 250 | 0.05 - 0.12 |
| K | Ductile cast irons 450-10S, etc. | 150 ~ 250 | AH725 | 80 - 200 | 0.05 - 0.12 |
| N | Aluminium alloys Si < 13% | - | TH10 | 200 - 500 | 0.05 - 0.15 |
| N | Aluminium alloys Si ≥ 13% | - | TH10 | 100 - 200 | 0.05 - 0.15 |

MEMO

# TPW13

## Square shoulder mills with screw clamped SWMT/SWGT13 inserts

A.R. = +11.5°, R.R. = -13° ~ -10.5°



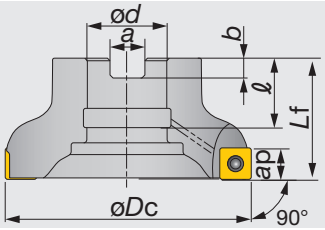



Fig.1

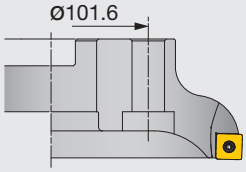


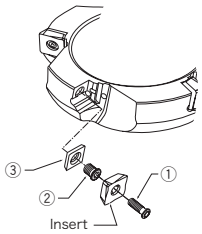

Fig.2

Right hand (R) shown.

| Designation | Max. *ap* | *øDc* | z | *Lf* | *ød* | *ℓ* | *a* | *b* | Kg | Airhole | Insert | Style |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TPW13R050M22.0E04 | 10 | 50 | 4 | 40 | 22 | 20 | 10.4 | 6.3 | 0.3 | with | SW*T1304... | Fig.1 |
| TPW13R050M22.0E05 | 10 | 50 | 5 | 40 | 22 | 20 | 10.4 | 6.3 | 0.3 | with | SW*T1304... | Fig.1 |
| TPW13R063M22.0E05 | 10 | 63 | 5 | 40 | 22 | 20 | 10.4 | 6.3 | 0.4 | with | SW*T1304... | Fig.1 |
| TPW13R063M22.0E06 | 10 | 63 | 6 | 40 | 22 | 20 | 10.4 | 6.3 | 0.4 | with | SW*T1304... | Fig.1 |
| TPW13R080M27.0E06 | 10 | 80 | 6 | 50 | 27 | 22 | 12.4 | 7 | 0.8 | with | SW*T1304... | Fig.1 |
| TPW13R080M27.0E08 | 10 | 80 | 8 | 50 | 27 | 22 | 12.4 | 7 | 0.8 | with | SW*T1304... | Fig.1 |
| TPW13R100M32.0E07 | 10 | 100 | 7 | 50 | 32 | 28.5 | 14.4 | 8 | 1.2 | with | SW*T1304... | Fig.1 |
| TPW13R100M32.0E10 | 10 | 100 | 10 | 50 | 32 | 28.5 | 14.4 | 8 | 1.2 | with | SW*T1304... | Fig.1 |
| TPW13R125M40.0E08 | 10 | 125 | 8 | 63 | 40 | 32 | 16.4 | 9 | 2.4 | with | SW*T1304... | Fig.1 |
| TPW13R125M40.0E12 | 10 | 125 | 12 | 63 | 40 | 32 | 16.4 | 9 | 2.5 | with | SW*T1304... | Fig.1 |

### SPARE PARTS

| Designation | ①Clamping screw | Lubricant | ②Screw | Shell locking bolt | Shell locking bolt 1 | ③Shim | Wrench for ① | Wrench for ② |
|---|---|---|---|---|---|---|---|---|
| TPW13R050, 063... | CSPB-3.5 | M-1000 | DTS5-3.5SS | - | CM10X30H | FSSP1102 | IP-15D | P-3.5 |
| TPW13R080M... | CSPB-3.5 | M-1000 | DTS5-3.5SS | - | CM12X30H | FSSP1102 | IP-15D | P-3.5 |
| TPW13R100M... | CSPB-3.5 | M-1000 | DTS5-3.5SS | TMBA-M16H | - | FSSP1102 | IP-15D | P-3.5 |
| TPW13R125M... | CSPB-3.5 | M-1000 | DTS5-3.5SS | TMBA-M20H | - | FSSP1102 | IP-15D | P-3.5 |

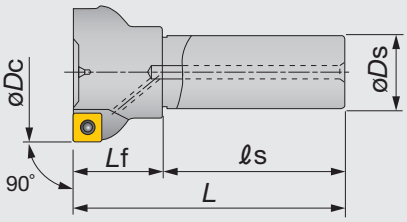


## EPW13

Square shoulder endmills with screw clamped SWMT/SWGT13 inserts

A.R. = +11.5°, R.R. = -13° ~ -10.5°



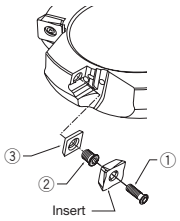



Right hand (R) shown.

| Designation | Max. *ap* | ø*Dc* | z | ø*Ds* | *ℓs* | *Lf* | *L* | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| EPW13R032M32.0-02 | 10 | 32 | 2 | 32 | 80 | 35 | 115 | 0.6 | with | SW*T1304... |
| EPW13R040M32.0-03 | 10 | 40 | 3 | 32 | 80 | 35 | 115 | 0.7 | with | SW*T1304... |
| EPW13R050M32.0-03 | 10 | 50 | 3 | 32 | 80 | 40 | 120 | 0.9 | with | SW*T1304... |
| EPW13R050M32.0-04 | 10 | 50 | 4 | 32 | 80 | 40 | 120 | 0.9 | with | SW*T1304... |
| EPW13R063M32.0-04 | 10 | 63 | 4 | 32 | 80 | 40 | 120 | 1 | with | SW*T1304... |
| EPW13R063M32.0-05 | 10 | 63 | 5 | 32 | 80 | 40 | 120 | 1 | with | SW*T1304... |
| EPW13R080M32.0-04 | 10 | 80 | 4 | 32 | 80 | 40 | 120 | 1.3 | with | SW*T1304... |
| EPW13R080M32.0-06 | 10 | 80 | 6 | 32 | 80 | 40 | 120 | 0.8 | with | SW*T1304... |

### SPARE PARTS

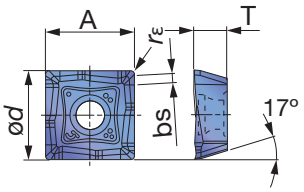
| Designation | ①Clamping screw | Lubricant | ②Screw | ③Shim | Wrench for ① | Wrench for ② |
|---|---|---|---|---|---|---|
| EPW13R032, 040... | CSPB-3.5 | M-1000 | - | - | IP-15D | - |
| EPW13R050 - 080... | CSPB-3.5 | M-1000 | DTS5-3.5SS | FSSP1102 | IP-15D | P-3.5 |



## INSERT

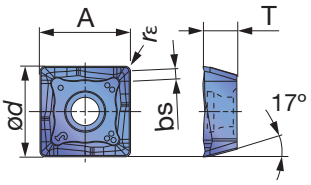
### SWGT1304-MJ





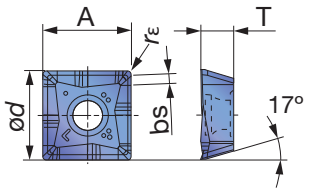

### SWMT1304-MJ





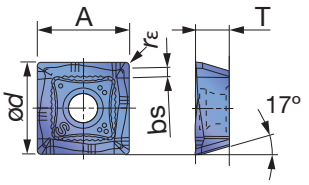

### SWMT1304-ML





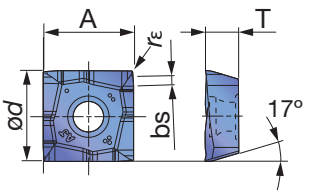

### SWMT1304-MS






### SWGT1304-AJ






| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ★ | | | | | ★ | | ★ | | | |
| M | Stainless | | ★ | ★ | | | | | | | | |
| K | Cast iron | ★ | | | ★ | ★ | | | | | | |
| N | Non-ferrous | | | | | | | ★ | | | ★ | |
| S | Superalloys | ★ | ☆ | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | |

★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | Coating | | | | | | | Cermet | | Un-coated | | A | ød | T | bs |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | AH120 | AH130 | AH140 | T1115 | T1215 | T3130 | DS1100 | NS740 | | KS05F | | | | | |
| SWGT1304PDPR-MJ | 0.8 | 10 | ● | | | | | | | ● | | | | 13.6 | 13.6 | 5 | 1.4 |
| SWMT1304PDPR-MJ | 0.8 | 10 | ● | ● | ● | ● | ● | ● | | ● | | | | 13.6 | 13.6 | 5 | 1.4 |
| SWMT1304PDER-ML | 0.8 | 10 | ● | | | | | | | | | | | 13.6 | 13.6 | 5 | 1.4 |
| SWMT1304PDPR-MS | 0.8 | 10 | | ● | ● | | | | | | | | | 13.6 | 13.6 | 5 | 1.4 |
| SWGT1304PDFR-AJ | 0 | 10 | | | | | | | ● | | | ● | | 13.6 | 13.6 | 5 | 1.6 |

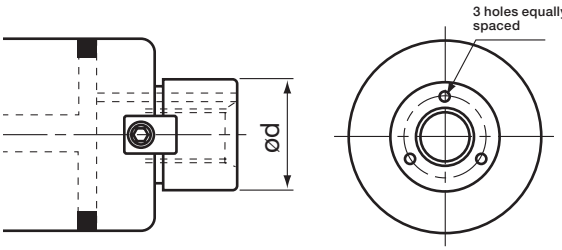
●: Line-up

# STANDARD CUTTING CONDITIONS TPW / EPW13 TYPE

| ISO | Workpiece material | Recommended insert grade | Cutting speed *Vc* (m/min) | Roughing (Depth of cut: ap ≥ 1.0 mm) Feed per tooth: *fz* (mm/t) | | | | Light cutting to finishing (Depth of cut: ap ≤ 1.0 mm) Feed per tooth: *fz* (mm/t) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | MJ | ML | MS | AJ | MJ | ML | MS | AJ |
| P | Mild steels Low carbon steels < 180HB | AH120 (First choice) | 100 - 270 | 0.05 - 0.25 | 0.05 - 0.2 | - | - | 0.05 - 0.2 | 0.05 - 0.18 | - | - |
| | | T3130 (Priority on wear resistance) | 150 - 300 | 0.05 - 0.25 | - | - | - | 0.05 - 0.2 | - | - | - |
| | | AH130 / AH140 (Priority on impact resistance) | 80 - 180 | 0.05 - 0.25 | - | 0.05 - 0.2 | - | 0.05 - 0.2 | - | 0.05 - 0.18 | - |
| | | NS740 (Priority on surface finish) | 100 - 300 | 0.05 - 0.15 | - | - | - | 0.05 - 0.12 | - | - | - |
| | Carbon steels Alloy steels < 300HB | AH120 (First choice) | 100 - 230 | 0.05 - 0.2 | 0.05 - 0.15 | - | - | 0.05 - 0.18 | 0.05 - 0.12 | - | - |
| | | T3130 (Priority on wear resistance) | 150 - 280 | 0.05 - 0.2 | - | - | - | 0.05 - 0.18 | - | - | - |
| | | AH130 / AH140 (Priority on impact resistance) | 80 - 150 | 0.05 - 0.2 | - | - | - | 0.05 - 0.18 | - | - | - |
| | | NS740 (Priority on surface finish) | 100 - 230 | 0.05 - 0.15 | - | - | - | 0.05 - 0.12 | - | - | - |
| | Die steels < 30HRC | AH120 (First choice) | 100 - 180 | 0.05 - 0.15 | 0.05 - 0.12 | - | - | 0.05 - 0.12 | 0.05 - 0.1 | - | - |
| | | T3130 (Priority on wear resistance) | 100 - 180 | 0.05 - 0.15 | - | - | - | 0.05 - 0.12 | - | - | - |
| M | Stainless steels < 50HB | AH130 / AH140 (First choice) | 80 - 200 | 0.05 - 0.2 | - | 0.05 - 0.18 | - | 0.05 - 0.18 | - | 0.05 - 0.15 | - |
| | | AH120 (Priority on wear resistance) | 150 - 250 | 0.05 - 0.2 | 0.05 - 0.15 | - | - | 0.05 - 0.18 | 0.05 - 0.12 | - | - |
| K | Grey cast irons Ductile cast irons | T1215 (First choice) | 100 - 250 | 0.05 - 0.2 | - | - | - | 0.05 - 0.18 | - | - | - |
| | | AH120 (Priority on impact resistance) | 100 - 250 | 0.05 - 0.2 | 0.05 - 0.15 | - | - | 0.05 - 0.18 | 0.05 - 0.12 | - | - |
| N | Aluminium alloys Si < 13 % | DS1100 / KS05F (First choice) | 300 - 1000 | - | - | - | 0.05 - 0.2 | - | - | - | 0.05 - 0.2 |
| | Aluminium alloys Si ≥ 13 % | DS1100 / KS05F (First choice) | 80 - 300 | - | - | - | 0.05 - 0.2 | - | - | - | 0.05 - 0.2 |
| | Copper alloys | DS1100 / KS05F (First choice) | 200 - 500 | - | - | - | 0.05 - 0.2 | - | - | - | 0.05 - 0.2 |

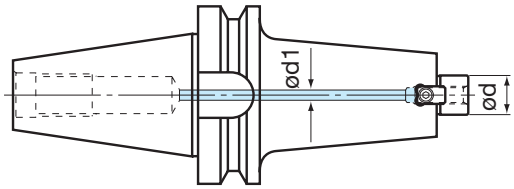
Notes:
- When machining at large depth of cut or large cutting width, *Vc* and *fz* should be reduced.
- As a rule, dry machining (including air blow) is recommended. But, for excessive chip welding, such as when machining stainless steels, use a water soluble cutting fluid. In this case, use AH140 and set the cutting speed to *Vc* ≤ 100 m/min.
- When machining mild steel, carbon steel or alloy steel in wet conditions the T3130 is recommended. In this case, *Vc* and *fz* should be reduced.
- TPW13 type can not be used for ramping, plunging and drilling.

## Face mill arbors with center through-coolant hole




| Cutter diameter ø*D* (mm) | 50/63 | 80 | 100 | 125 | 160 |
|---|---|---|---|---|---|
| Nominal diameter ø*d* (mm) | 22 | 25.4 | 31.75 | 38.1 | 50.8 |
| Arbor type | FMH22 | FMH25.4 | FMH31.75 | FMH38.1 | FMH50.8 |

## Notes on arbors: when using TAW13 or TPW13 type, use through center air.




| Nominal diameter ø*d* (mm) | 16 | 22 | 25.4 | 31.75 | 38.1 | 50.8 |
|---|---|---|---|---|---|---|
| Applicable arbor types | SMA SM1 | FMC SM1 | FMA FMC | FMA SMB | FMA | FMA |
| Through hole diameter ø*d*1 (mm) | 4 ~ 6 | 5 ~ 8 | 6 ~ 9 | 10 ~ 13 | 10 ~ 15 | 10 ~ 15 |

When using the TAW13 or TPW13 type with through center air (coolant or mist), the correct arbor must be used with through center air supplying.

## Cautionary notes in use

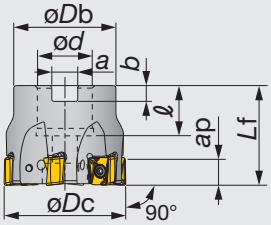
- In slotting or pocketing, when chips are likely to remain in the cutting zone, internal air supplying or air blow is recommended to prevent chip recutting.
- Use of inserts other than those specified, can result in poor cutting and cause damage to the cutter body. Therefore, specified inserts from the Tungaloy catalogue must be used.
- Before changing or indexing the inserts, remove chips or other foreign matter from the insert, insert pocket and cutter body by using an air blast or cloth.
- The inserts should be clamped by using the wrench supplied with the TAC Mill.
- After a long period of use, the clamping screws and wrench may become deformed or damaged. These elements must be replaced as soon as possible.

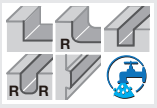
MEMO

## Square shoulder mills with LQMU type double sided tough inserts with 4edges

A.R. = +4° ~ +5°, R.R. = +13° ~ +15°






Right hand (R) shown.

| Designation | Max. ap | øDc | z | øDb | Lf | ød | ℓ | a | b | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TPQ11R040M16.0E04 | 9 | 40 | 4 | 35 | 40 | 16 | 20 | 8.4 | 5.6 | 0.2 | with | LQMU1107... |
| TPQ11R050M22.0E06 | 9 | 50 | 6 | 41 | 40 | 22 | 20 | 10.4 | 6.3 | 0.4 | with | LQMU1107... |
| TPQ11R063M22.0E07 | 9 | 63 | 7 | 47 | 40 | 22 | 20 | 10.4 | 6.3 | 0.5 | with | LQMU1107... |
| TPQ11R080M27.0E10 | 9 | 80 | 10 | 58 | 50 | 27 | 26 | 12.4 | 7 | 1 | with | LQMU1107... |
| TPQ11R100M32.0E12 | 9 | 100 | 12 | 66 | 50 | 32 | 32 | 14.4 | 8 | 1.6 | with | LQMU1107... |
| TPQ18R050M22.0E03 | 14 | 50 | 3 | 47 | 40 | 22 | 20 | 10.4 | 6.3 | 0.4 | with | LQMU1808... |
| TPQ18R063M27.0E04 | 16 | 63 | 4 | 58 | 50 | 27 | 26 | 12.4 | 7 | 0.5 | with | LQMU1808... |
| TPQ18R080M27.0E05 | 16 | 80 | 5 | 58 | 50 | 27 | 26 | 12.4 | 7 | 0.9 | with | LQMU1808... |
| TPQ18R100M32.0E06 | 16 | 100 | 6 | 66 | 50 | 32 | 32 | 14.4 | 8 | 1.4 | with | LQMU1808... |
| TPQ18R125M40.0E08 | 16 | 125 | 8 | 82 | 63 | 40 | 38 | 16.4 | 9 | 2.9 | with | LQMU1808... |
| TPQ18R160M40.0E09 | 16 | 160 | 9 | 100 | 63 | 40 | 38 | 16.4 | 9 | 4.1 | without | LQMU1808... |

### SPARE PARTS







| Designation | Clamping screw | Grip | Grip 1 | Torx bit | Center bolt |
|---|---|---|---|---|---|
| TPQ11R040M16.0E04 | CSTB-3.5L115 | SW6-SD | - | BLDT10/S7 | CM8×30H |
| TPQ11R050M22.0E06 | CSTB-3.5L115 | SW6-SD | - | BLDT10/S7 | CM10×30H |
| TPQ11R063M22.0E07 | CSTB-3.5L115 | SW6-SD | - | BLDT10/S7 | CM10×30H |
| TPQ11R080M27.0E10 | CSTB-3.5L115 | SW6-SD | - | BLDT10/S7 | CM12×30H |
| TPQ11R100M32.0E12 | CSTB-3.5L115 | SW6-SD | - | BLDT10/S7 | TMBA-M16H |
| TPQ18R050M22.0E03 | SR14-591 | - | H-TB | BT20M | CM10×30H |
| TPQ18R063M27.0E04 | SR14-591 | - | H-TB | BT20M | CM12×30H |
| TPQ18R080M27.0E05 | SR14-591 | - | H-TB | BT20M | CM12×30H |
| TPQ18R100M32.0E06 | SR14-591 | - | H-TB | BT20M | TMBA-M16H |
| TPQ18R125M40.0E08 | SR14-591 | - | H-TB | BT20M | TMBA-M20H |
| TPQ18R160M40.0E09 | SR14-591 | - | H-TB | BT20M | - |

Square shoulder endmills with LQMU type double sided tough inserts with 4 edges

A.R. = +4° ~ +5°, R.R. = +13° ~ +15°



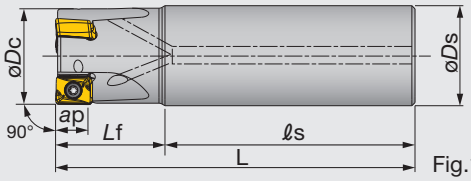



Fig.1

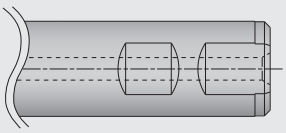
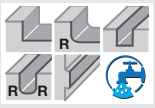


Fig.2




Right hand (R) shown.

| Designation | Max. ap | øDc | z | øDs | ℓs | Lf | L | Kg | Air hole | Insert | Shank style |
|---|---|---|---|---|---|---|---|---|---|---|---|
| EPQ11R025M25.0-02 | 9 | 25 | 2 | 25 | 70 | 30 | 100 | 0.3 | with | LQMU1107... | Fig.1 |
| EPQ11R032M32.0-03 | 9 | 32 | 3 | 32 | 80 | 35 | 115 | 0.7 | with | LQMU1107... | Fig.1 |
| EPQ11R040M32.0-04 | 9 | 40 | 4 | 32 | 80 | 35 | 115 | 0.8 | with | LQMU1107... | Fig.1 |
| EPQ11R050M32.0-05 | 9 | 50 | 5 | 32 | 80 | 40 | 120 | 0.9 | with | LQMU1107... | Fig.1 |
| EPQ11R063M32.0-06 | 9 | 63 | 6 | 32 | 80 | 40 | 120 | 1.1 | with | LQMU1107... | Fig.1 |
| EPQ11R080M32.0-07 | 9 | 80 | 7 | 32 | 80 | 40 | 120 | 1.4 | with | LQMU1107... | Fig.1 |
| EPQ18R040M32.0W03 | 14 | 40 | 3 | 32 | 75 | 35 | 110 | 0.7 | with | LQMU1808... | Fig.2 |
| EPQ18R050M32.0W04 | 14 | 50 | 4 | 32 | 75 | 40 | 115 | 0.9 | with | LQMU1808... | Fig.2 |

## SPARE PARTS





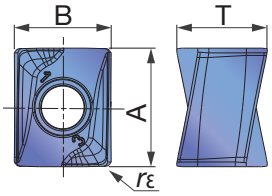


| Designation | Clamping screw | Grip | Grip 1 | Torx bit | Wrench |
|---|---|---|---|---|---|
| EPQ11... | CSTB-3.5L115 | SW6-SD | - | BLDT10/S7 | T-10D |
| EPQ18... | SR14-591 | - | H-TB | BT20M | T-20D |

## INSERT

### LQMU11/18-MJ






| | | | | |
|---|---|---|---|---|
| P | Steel | ☆ | | ★ |
| M | Stainless | | ★ | ☆ |
| K | Cast iron | ★ | | ☆ |
| N | Non-ferrous | | | |
| S | Superalloys | ★ | | ★ |
| H | Hard materials | | | |

★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | Coating AH120 | Coating AH140 | Coating AH725 | A | T | B |
|---|---|---|---|---|---|---|---|---|
| LQMU110704PNER-MJ | 0.4 | 9 | ● | ● | ● | 11 | 8.3 | 9 |
| LQMU110708PNER-MJ | 0.8 | 9 | ● | ● | ● | 11 | 8.3 | 9 |
| LQMU110716PNER-MJ | 1.6 | 9 | ● | ● | ● | 11 | 8.3 | 9 |
| LQMU110720PNER-MJ | 2 | 9 | ● | | | 11 | 8.3 | 9 |
| LQMU180804PNER-MJ | 0.4 | 16 | ● | ● | ● | 17.5 | 10.9 | 11.5 |
| LQMU180808PNER-MJ | 0.8 | 16 | ● | ● | ● | 17.5 | 10.9 | 11.5 |
| LQMU180816PNER-MJ | 1.6 | 16 | ● | ● | ● | 17.5 | 10.9 | 11.5 |
| LQMU180824PNER-MJ | 2.4 | 16 | ● | ● | ● | 17.5 | 10.9 | 11.5 |

●: Line-up

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Hardness HB | Grade | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) |
|---|---|---|---|---|---|
| P | Low carbon steel C15E, etc. | - 200 | AH725 | 100 - 250 | 0.1 - 0.25 |
| | High carbon steel C45, C55, etc. | 200 - 300 | AH725 | 100 - 230 | 0.1 - 0.2 |
| | Alloy steel 42CrMo4, etc. | 150 - 300 | AH725 | 100 - 230 | 0.1 - 0.2 |
| | Tool steel X153CrMoV12, etc. | - 300 | AH725 | 100 - 180 | 0.1 - 0.2 |
| M | Stainless steel X5CrNi18-9, etc. | - | AH140 | 90 - 180 | 0.1 - 0.25 |
| K | Grey cast iron 250, etc. | 150 - 250 | AH120 | 140 - 250 | 0.1 - 0.25 |
| | Ductile cast iron 450-10S, etc. | 150 - 250 | AH120 | 110 - 200 | 0.1 - 0.25 |
| S | Superalloys Inconel 718, Ti-6Al-4V, etc. | - | AH725 | 20 - 50 | 0.08 - 0.2 |

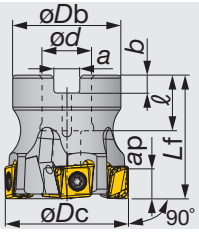
· To remove excessive chip accumulation use an air blast.
· When cutting an interrupted surface or a casted skin, the feed per tooth (*fz*) should be reduced to the lower recommended value shown in the above table.
· Cutting conditions are limited by machine power, work piece rigidity and spindle output. When the cutting width, depth or over hang length is large, set *Vc* and *fz* to the lower recommended values and check the machine power and vibration.

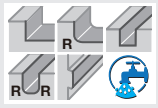
MEMO

## TECMILL
### TPM11,16
Square shoulder mills with LMMU type tangential clamped insert with 4 edges

A.R. = +5° ~ +6°, R.R. = +9° ~ +13°

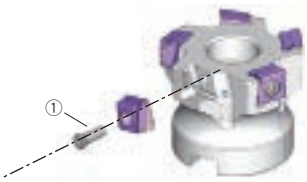





Right hand (R) shown.

| Designation | Max. ap | øDc | z | øDb | Lf | ød | ℓ | a | b | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TPM11R050M22.0E05 | 9.7 | 50 | 5 | 41 | 40 | 22 | 20 | 10.4 | 6.3 | 0.3 | with | LMMU1107... |
| TPM11R063M22.0E06 | 9.7 | 63 | 6 | 41 | 40 | 22 | 20 | 10.4 | 6.3 | 0.5 | with | LMMU1107... |
| TPM11R080M27.0E07 | 9.7 | 80 | 7 | 50 | 50 | 27 | 22 | 12.4 | 7 | 1 | with | LMMU1107... |
| TPM11R080M27.0E09 | 9.7 | 80 | 9 | 50 | 50 | 27 | 22 | 12.4 | 7 | 1 | with | LMMU1107... |
| TPM11R100M32.0E08 | 9.7 | 100 | 8 | 60 | 50 | 32 | 28.5 | 14.4 | 8 | 1.4 | with | LMMU1107... |
| TPM11R100M32.0E11 | 9.7 | 100 | 11 | 60 | 50 | 32 | 28.5 | 14.4 | 8 | 1.5 | with | LMMU1107... |
| TPM16R080M27.0E05 | 15.1 | 80 | 5 | 50 | 50 | 27 | 22 | 12.4 | 7 | 1 | with | LMMU1609... |
| TPM16R100M32.0E06 | 15.1 | 100 | 6 | 60 | 50 | 32 | 28.5 | 14.4 | 8 | 1.5 | with | LMMU1609... |
| TPM16R125M40.0E07 | 15.1 | 125 | 7 | 71 | 63 | 40 | 32 | 16.4 | 9 | 2.7 | with | LMMU1609... |



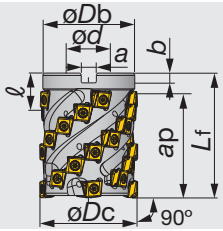

SPARE PARTS

| Designation | ①Clamping screw | Grip | Shell locking bolt | Shell locking bolt 1 | Torx bit |
|---|---|---|---|---|---|
| TPM11R050, 063... | CSTB-3.5L110 | H-TB | - | CM10X30H | BT15S |
| TPM11R080M... | CSTB-3.5L110 | H-TB | - | CM12X30H | BT15S |
| TPM11R100M... | CSTB-3.5L110 | H-TB | TMBA-M16H | - | BT15S |
| TPM16R080M27.0E05 | CSTB-5L159 | H-TB | - | CM12X30H | BT20S |
| TPM16R100M32.0E06 | CSTB-5L159 | H-TB | TMBA-M16H | - | BT20S |
| TPM16R125M40.0E07 | CSTB-5L159 | H-TB | TMBA-M20H | - | BT20S |

## TECMILL
### TLM11
Square shoulder mills for roughing with LMMU type tangential clamped insert with 4 edges

A.R. = +5° ~ +6°, R.R. = +9° ~ +13°









| Designation | Max. ap | øDc | Z eff | z | øDb | Lf | ød | ℓ | a | b | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TLM11R050M22.0E03 | 58.5 | 50 | 3 | 21 | 47 | 70 | 22 | 20 | 10.4 | 6.3 | 0.8 | with | LMMU1107... |
| TLM11R063M27.0E04 | 66.9 | 63 | 4 | 32 | 59 | 80 | 27 | 22 | 12.4 | 7 | 1.4 | with | LMMU1107... |

SPARE PARTS

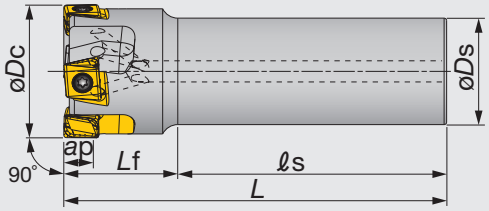
| Designation | Clamping screw | Grip | Shell locking bolt | Torx bit |
|---|---|---|---|---|
| TLM11R050M22.0E03 | CSTB-3.5L110 | H-TB | SD06-A3 | BT15S |
| TLM11R063M27.0E04 | CSTB-3.5L110 | H-TB | SD08-98 | BT15S |

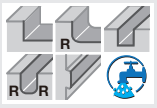
# EPM11

## Square shoulder endmills with LMMU type tangential clamped insert with4 edges

A.R. = +5° ~ +6°, R.R. = +9° ~ +13°






Right hand (R) shown.

| Designation | Max. ap | øDc | z | øDs | ℓs | Lf | L | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| EPM11R032M32.0-03 | 9.7 | 32 | 3 | 32 | 80 | 35 | 115 | 0.6 | with | LMMU1107... |
| EPM11R040M32.0-04 | 9.7 | 40 | 4 | 32 | 80 | 35 | 115 | 0.7 | with | LMMU1107... |
| EPM11R050M32.0-04 | 9.7 | 50 | 4 | 32 | 80 | 40 | 120 | 0.9 | with | LMMU1107... |
| EPM11R063M32.0-06 | 9.7 | 63 | 6 | 32 | 80 | 40 | 120 | 1.2 | with | LMMU1107... |
| EPM11R080M32.0-07 | 9.7 | 80 | 7 | 32 | 80 | 40 | 120 | 1.6 | with | LMMU1107... |

### SPARE PARTS



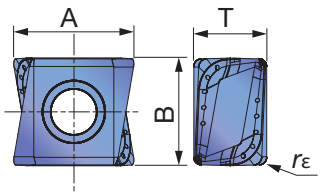


| Designation | Clamping screw | Wrench |
|---|---|---|
| EPM11... | CSTB-3.5L110 | T-15DB |

## INSERT

### LMMU11/16-MJ






| | | | | | | | |
|---|---|---|---|---|---|---|---|
| P | Steel | ☆ | | ★ | | ☆ | |
| M | Stainless | | ★ | ☆ | | | |
| K | Cast iron | ★ | | ☆ | ☆ | | |
| N | Non-ferrous | | | | | | |
| S | Superalloys | ★ | | ★ | | | |
| H | Hard materials | | | | | | |

★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | Coating AH120 | AH140 | AH725 | T1115 | T3130 | A | B | T |
|---|---|---|---|---|---|---|---|---|---|---|
| LMMU110708PNER-MJ | 0.8 | 9.7 | ● | ● | ● | ● | ● | 11.7 | 10.5 | 7.1 |
| LMMU110716PNER-MJ | 1.6 | 9.7 | ● | ● | ● | ● | ● | 11.5 | 10.5 | 7.1 |
| LMMU110724PNER-MJ | 2.4 | 9.7 | ● | ● | ● | ● | ● | 11.3 | 10.5 | 7.1 |
| LMMU110732PNER-MJ | 3.2 | 9.7 | ● | ● | ● | ● | ● | 11.1 | 10.5 | 7.1 |
| LMMU160908PNER-MJ | 0.8 | 15.1 | ● | ● | ● | ● | ● | 17.3 | 16 | 9.5 |
| LMMU160916PNER-MJ | 1.6 | 15.1 | ● | ● | ● | ● | ● | 17.1 | 16 | 9.5 |
| LMMU160924PNER-MJ | 2.4 | 15.1 | ● | ● | ● | ● | | 16.9 | 16 | 9.5 |
| LMMU160932PNER-MJ | 3.2 | 15.1 | ● | ● | ● | ● | | 16.8 | 16 | 9.5 |

●: Line-up

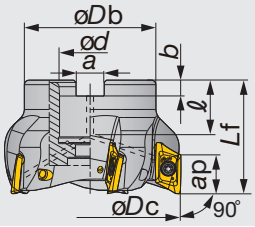
# TUNG-ALUMILL

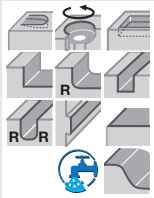
## TPV16

90° shoulder milling shellmills with screw clamped XVCT16 inserts for aluminum machining

A.R. = +10° ~ +11°, R.R. = -9° ~ -5.5°





| Designation | øDc | z | øDb | ød | ℓ | Lf | b | a | Kg | Air hole | Max. RPM (min-1) | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TPV16R040M16.0E03 | 40 | 3 | 38 | 16 | 20 | 50 | 5.6 | 8.4 | 0.23 | with | 30,000 | XVCT1605... |
| TPV16R050M22.0E04 | 50 | 4 | 45 | 22 | 22 | 50 | 6.3 | 10.4 | 0.33 | with | 27,000 | XVCT1605... |
| TPV16R063M22.0E05 | 63 | 5 | 47 | 22 | 22 | 50 | 6.3 | 10.4 | 0.54 | with | 24,000 | XVCT1605... |
| TPV16R080M27.0E05 | 80 | 5 | 58 | 27 | 28 | 50 | 7 | 12.4 | 0.86 | with | 21,000 | XVCT1605... |
| TPV16R100M32.0E06 | 100 | 6 | 66 | 32 | 26 | 63 | 8 | 14.4 | 1.55 | with | 19,000 | XVCT1605... |
| TPV16R125M40.0E07 | 125 | 7 | 85 | 40 | 32 | 63 | 9 | 16.4 | 2.53 | with | 17,000 | XVCT1605... |

### SPARE PARTS

| Designation | Clamping screw | Grip | Shell locking bolt | Torx bit |
|---|---|---|---|---|
| TPV16R040M16.0E03 | TS40093I/HG | H-TBS | SHM8X1.25X35-C | BT15S |
| TPV16R050 - 063... | TS40093I/HG | H-TBS | SHM10X1.5X30-C | BT15S |
| TPV16R080M27.0E05 | TS40093I/HG | H-TBS | LHM12X1.75X30-C | BT15S |
| TPV16R100M32.0E06 | TS40093I/HG | H-TBS | SHM16X2X35-C | BT15S |
| TPV16R125M40.0E07 | TS40093I/HG | H-TBS | SHM20X2.5X40-C | BT15S |



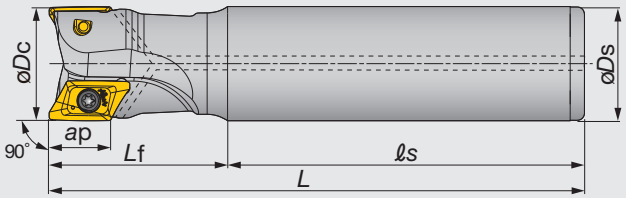
# TUNG-ALUMILL

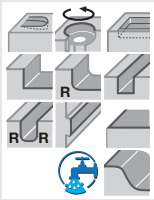
## EPV16

90° endmills with screw clamped XVCT16 inserts for aluminum machining

A.R. = +6° ~ +10°, R.R. = -12° ~ -9°





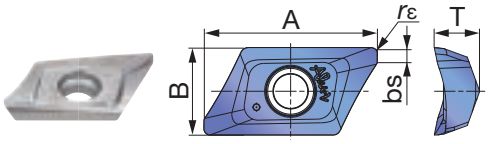
| Designation | øDc | z | øDs | ℓs | Lf | L | Kg | Air hole | Max. RPM (min-1) | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| EPV16R025M25.0-02 | 25 | 2 | 25 | 70 | 55 | 125 | 0.37 | with | 38,000 | XVCT1605... |
| EPV16R025M25.0-02L | 25 | 2 | 25 | 100 | 70 | 170 | 0.53 | with | 38,000 | XVCT1605... |
| EPV16R032M32.0-02 | 32 | 2 | 32 | 100 | 50 | 150 | 0.77 | with | 34,000 | XVCT1605... |
| EPV16R032M32.0-02L | 32 | 2 | 32 | 120 | 80 | 200 | 1.03 | with | 34,000 | XVCT1605... |
| EPV16R032M32.0-03 | 32 | 3 | 32 | 100 | 50 | 150 | 0.76 | with | 34,000 | XVCT1605... |
| EPV16R032M32.0-03L | 32 | 3 | 32 | 120 | 80 | 200 | 1.03 | with | 34,000 | XVCT1605... |
| EPV16R040M32.0-03 | 40 | 3 | 32 | 120 | 50 | 170 | 0.94 | with | 30,000 | XVCT1605... |
| EPV16R040M32.0-03L | 40 | 3 | 32 | 195 | 55 | 250 | 1.43 | with | 30,000 | XVCT1605... |

### SPARE PARTS

| Designation | Clamping screw | Grip | Torx bit |
|---|---|---|---|
| EPV16R025M... | TS40085I/HG | H-TBS | BT15S |
| EPV16R032M... | TS40093I/HG | H-TBS | BT15S |
| EPV16R040M... | TS40093I/HG | H-TBS | BT15S |

## INSERT

### XVCT16-AJ




| | | |
|---|---|---|
| P | Steel | |
| M | Stainless | |
| K | Cast iron | |
| N | Non-ferrous | ★ |
| S | Superalloys | |
| H | Hard materials | |

★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | Un-coated TH10 | A | B | T | bs |
|---|---|---|---|---|---|---|---|
| XVCT160504R-AJ | 0.4 | 16 | ● | 22.2 | 11.2 | 5.9 | 1.3 |
| XVCT160508R-AJ | 0.8 | 16 | ● | 22.2 | 11.2 | 5.9 | 1 |
| XVCT160512R-AJ | 1.2 | 15.5 | ● | 21.7 | 11.2 | 5.8 | 1 |
| XVCT160516R-AJ | 1.6 | 15 | ● | 21.2 | 11.2 | 5.75 | 1 |
| XVCT160520R-AJ | 2 | 14.5 | ● | 20.8 | 11.2 | 5.75 | 1 |
| XVCT160530R-AJ | 3 | 14 | ● | 19.5 | 11.2 | 5.6 | 1 |
| XVCT160532R-AJ | 3.2 | 14 | ● | 19.2 | 11.2 | 5.6 | 1 |
| XVCT160540R-AJ | 4 | 13 | ● | 18.4 | 11.2 | 5.5 | 1.2 |
| XVCT160550R-AJ | 5 | 13 | ● | 18.4 | 11.2 | 5.4 | 0.4 |

●: Line-up

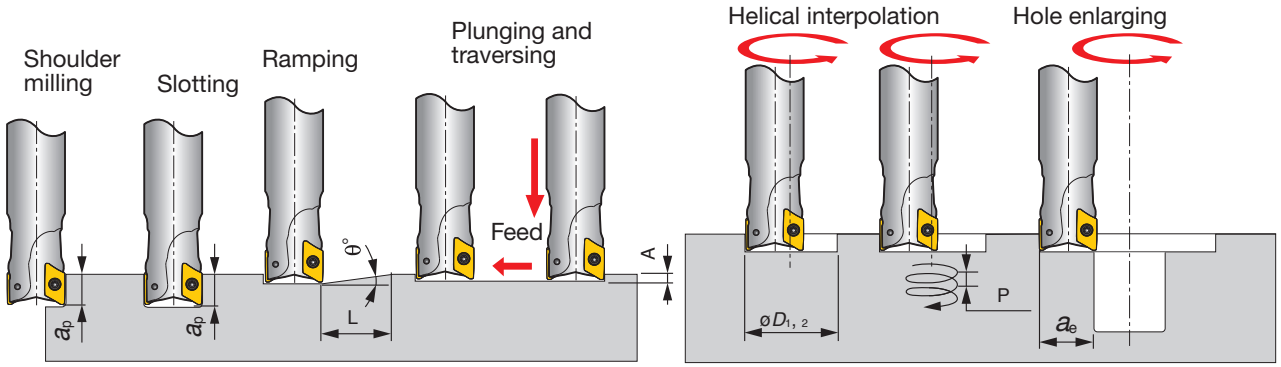
## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Hardness HB | Grade | Chip-breaker | Cutting speed Vc (m/min) | Feed per tooth fz (mm/t) |
|---|---|---|---|---|---|---|
| N | Aluminium alloy | 60 | TH10 | AJ | 300 - 5000 | 0.15 - 0.35 |
| | | 100 | TH10 | AJ | 200 - 2000 | 0.1 - 0.25 |
| | Cast aluminium alloy Si ≤ 12% | 75 | TH10 | AJ | 200 - 2000 | 0.15 - 0.3 |
| | | 90 | TH10 | AJ | 200 - 1500 | 0.1 - 0.25 |
| | Cast aluminium alloy Si > 12% | 130 | TH10 | AJ | 200 - 1000 | 0.07 - 0.15 |
| | Copper alloys Pb > 1% | 110 | TH10 | AJ | 200 - 800 | 0.07 - 0.15 |
| | Copper alloys | 90 | TH10 | AJ | 300 - 1000 | 0.1 - 0.15 |
| | | 100 | TH10 | AJ | 300 - 800 | 0.1 - 0.15 |
| | Duroplastics, fiber plastics | - | TH10 | AJ | 100 - 500 | 0.1 - 0.15 |
| | Hard rubber | - | TH10 | AJ | 100 - 300 | 0.1 - 0.15 |

**Safety guidelines**

1. Use only the original inserts, cutters and spare parts.
2. Insert pocket must be cleaned before clamping the insert.
3. Clamp torque of screw should be 4.5 N·m.
4. For safety reasons, use a new screw when changing the insert.
5. Maximum RPM values are determined based on the burst test. Using RPM beyond maximum values may cause insert breakage, machine damage or personal injury.
6. XVCT insert has sharp cutting edges. Always wear gloves for protection from injury when handling.

## APPLICATION RANGE




| | | | | Straight ramp down | | Step down | | Helical ramp down | | | | Hole enlarging |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Tool | Corner radius | Max. depth of cut | Max. ramping angle | Min. length | Max. plunging depth | Min. machining | Min. pitch/rev | Max. machining | Max. pitch/rev | Max. width |
| Designation | øDc | rε | ap | θ° | L | A | øD1 | P | øD2 | P | ae |
| EPV16R025... | 25 | 0.4, 0.8 | 16 | 22 | 40 | 4.2 | 29.1 | 4.4 | 50 | 13.6 | 22.5 |
| EPV16R025... | 25 | 1.2 | 15.5 | 22 | 40 | 4.2 | 29.1 | 4.4 | 50 | 13.6 | 22.5 |
| EPV16R025... | 25 | 1.6 | 15 | 22 | 38 | 3.7 | 29.1 | 4.4 | 50 | 13.2 | 22.5 |
| EPV16R025... | 25 | 2 | 14.5 | 22 | 38 | 3.7 | 29.1 | 4.4 | 50 | 13.2 | 22.5 |
| EPV16R025... | 25 | 3, 3.2 | 14 | 21 | 38 | 2.5 | 29.1 | 4.2 | 50 | 12.3 | 22.5 |
| EPV16R025... | 25 | 4, 5 | 13 | 18.5 | 40 | 2.3 | 29.1 | 3.7 | 50 | 12.3 | 22.5 |
| EPV16R032... | 32 | 0.4, 0.8 | 16 | 16.5 | 54 | 4 | 43.1 | 8.8 | 64 | 13.6 | 28.8 |
| EPV16R032... | 32 | 1.2 | 15.5 | 16.5 | 54 | 4 | 43.1 | 8.8 | 64 | 13.6 | 28.8 |
| EPV16R032... | 32 | 1.6 | 15 | 16 | 54 | 3.5 | 43.1 | 8.5 | 64 | 13.2 | 28.8 |
| EPV16R032... | 32 | 2 | 14.5 | 16 | 54 | 3.5 | 43.1 | 8.5 | 64 | 13.2 | 28.8 |
| EPV16R032... | 32 | 3, 3.2 | 14 | 15 | 54 | 3 | 43.1 | 7.9 | 64 | 12.3 | 28.8 |
| EPV16R032... | 32 | 4, 5 | 13 | 13.5 | 56 | 2.5 | 43.1 | 7.1 | 64 | 12.3 | 28.8 |
| T/EPV16R040... | 40 | 0.4, 0.8 | 16 | 11.5 | 79 | 4 | 59.1 | 10.4 | 80 | 13.6 | 36 |
| T/EPV16R040... | 40 | 1.2 | 15.5 | 11.5 | 79 | 4 | 59.1 | 10.4 | 80 | 13.6 | 36 |
| T/EPV16R040... | 40 | 1.6 | 15 | 11 | 80 | 3.5 | 59.1 | 9.9 | 80 | 13.2 | 36 |
| T/EPV16R040... | 40 | 2 | 14.5 | 11 | 80 | 3.5 | 59.1 | 9.9 | 80 | 13.2 | 36 |
| T/EPV16R040... | 40 | 3, 3.2 | 14 | 10 | 82 | 3 | 59.1 | 9 | 80 | 12.3 | 36 |
| T/EPV16R040... | 40 | 4, 5 | 13 | 8.5 | 90 | 2.5 | 59.1 | 7.6 | 80 | 12.3 | 36 |
| TPV16R050... | 50 | 0.4, 0.8 | 16 | 9.5 | 96 | 4 | 79.1 | 13 | 100 | 13.6 | 45 |
| TPV16R050... | 50 | 1.2 | 15.5 | 9.5 | 96 | 4 | 79.1 | 13 | 100 | 13.6 | 45 |
| TPV16R050... | 50 | 1.6 | 15 | 9 | 98 | 3.5 | 79.1 | 12.3 | 100 | 13.2 | 45 |
| TPV16R050... | 50 | 2 | 14.5 | 9 | 98 | 3.5 | 79.1 | 12.3 | 100 | 13.2 | 45 |
| TPV16R050... | 50 | 3.0, 3.2 | 14 | 8 | 103 | 3 | 79.1 | 10.9 | 100 | 12.3 | 45 |
| TPV16R050... | 50 | 4, 5 | 13 | 7 | 110 | 2.5 | 79.1 | 9.5 | 100 | 12.3 | 45 |
| TPV16R063... | 63 | 0.4, 0.8 | 16 | 7 | 130 | 4 | 105.1 | 13.6 | 126 | 13.6 | 56.7 |
| TPV16R063... | 63 | 1.2 | 15.5 | 7 | 130 | 4 | 105.1 | 13.6 | 126 | 13.6 | 56.7 |
| TPV16R063... | 63 | 1.6 | 15 | 6.5 | 136 | 3.5 | 105.1 | 12.8 | 126 | 13.2 | 56.7 |
| TPV16R063... | 63 | 2 | 14.5 | 6.5 | 136 | 3.5 | 105.1 | 12.8 | 126 | 13.2 | 56.7 |
| TPV16R063... | 63 | 3.0, 3.2 | 14 | 6 | 136 | 3 | 105.1 | 11.8 | 126 | 12.3 | 56.7 |
| TPV16R063... | 63 | 4, 5 | 13 | 5.5 | 140 | 2.5 | 105.1 | 10.8 | 126 | 12.3 | 56.7 |
| TPV16R080... | 80 | 0.4, 0.8 | 16 | 5 | 183 | 4 | 139.1 | 13.6 | 160 | 13.6 | 72 |
| TPV16R080... | 80 | 1.2 | 15.5 | 5 | 183 | 4 | 139.1 | 13.6 | 160 | 13.6 | 72 |
| TPV16R080... | 80 | 1.6 | 15 | 4.5 | 197 | 3.5 | 139.1 | 12.4 | 160 | 13.2 | 72 |
| TPV16R080... | 80 | 2 | 14.5 | 4.5 | 197 | 3.5 | 139.1 | 12.4 | 160 | 13.2 | 72 |
| TPV16R080... | 80 | 3, 3.2 | 14 | 4 | 207 | 3 | 139.1 | 11 | 160 | 12.3 | 72 |
| TPV16R080... | 80 | 4, 5 | 13 | 3.5 | 221 | 2.5 | 139.1 | 9.6 | 160 | 12.3 | 72 |
| TPV16R100... | 100 | 0.4, 0.8 | 16 | 3.5 | 262 | 4 | 179.1 | 12.9 | 200 | 13.6 | 90 |
| TPV16R100... | 100 | 1.2 | 15.5 | 3.5 | 262 | 4 | 179.1 | 12.9 | 200 | 13.6 | 90 |
| TPV16R100... | 100 | 1.6 | 15 | 3 | 296 | 3.5 | 179.1 | 11.1 | 200 | 13.2 | 90 |
| TPV16R100... | 100 | 2 | 14.5 | 3 | 296 | 3.5 | 179.1 | 11.1 | 200 | 13.2 | 90 |
| TPV16R100... | 100 | 3, 3.2 | 14 | 2.5 | 332 | 3 | 179.1 | 9.2 | 200 | 12.3 | 90 |
| TPV16R100... | 100 | 4, 5 | 13 | 2.5 | 309 | 2.5 | 179.1 | 9.2 | 200 | 11.6 | 90 |
| TPV16R125... | 125 | 0.4, 0.8 | 16 | 2.5 | 367 | 4 | 229.1 | 12.1 | 125 | 13.6 | 112.5 |
| TPV16R125... | 125 | 1.2 | 15.5 | 2.5 | 367 | 4 | 229.1 | 12.1 | 125 | 13.6 | 112.5 |
| TPV16R125... | 125 | 1.6 | 15 | 2 | 444 | 3.5 | 229.1 | 9.7 | 125 | 13.2 | 112.5 |
| TPV16R125... | 125 | 2 | 14.5 | 2 | 444 | 3.5 | 229.1 | 9.7 | 125 | 13.2 | 112.5 |
| TPV16R125... | 125 | 3, 3.2 | 14 | 1.5 | 554 | 3 | 229.1 | 7.3 | 125 | 8.7 | 112.5 |
| TPV16R125... | 125 | 4, 5 | 13 | 1.5 | 516 | 2.5 | 229.1 | 7.3 | 125 | 8.7 | 112.5 |

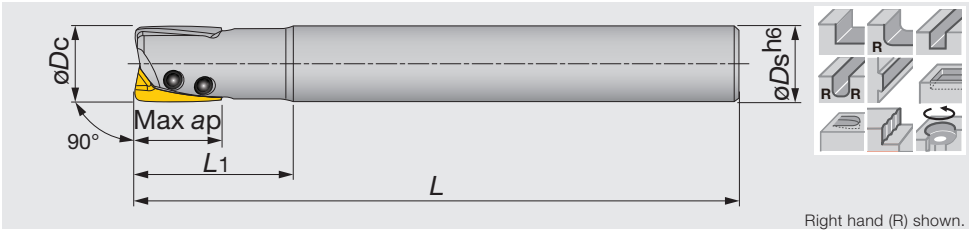
# HYBRIDTACMILL

## EPH

High precision shoulder square endmills in small diameter with XHGR type insert

A.R. = +14.7° ~ +19.5°, R.R. = -14.9° ~ -17.8°



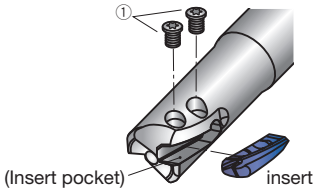



Right hand (R) shown.

| Designation | Max. *ap* | ø*D*c | z | ø*D*s | *L* | *L*1 | Insert |
|---|---|---|---|---|---|---|---|
| EPH11R010M10.0-2 | 10 | 10 | 2 | 10 | 80 | 21 | XHGR1102... |
| EPH11R010M10.0-2L | 10 | 10 | 2 | 10 | 100 | 36 | XHGR1102... |
| EPH13R012M12.0-2 | 12 | 12 | 2 | 12 | 80 | 25 | XHGR1302... |
| EPH13R012M12.0-2L | 12 | 12 | 2 | 12 | 110 | 43 | XHGR1302... |
| EPH13R013M12.0-2 | 12 | 13 | 2 | 12 | 110 | 25 | XHGR1302... |
| EPH13R014M12.0-2 | 12 | 14 | 2 | 12 | 110 | 25 | XHGR1302... |
| EPH18R016M16.0-2 | 16 | 16 | 2 | 16 | 100 | 33 | XHGR18T2... |
| EPH18R016M16.0-2L | 16 | 16 | 2 | 16 | 130 | 56 | XHGR18T2... |
| EPH18R016M16.0-3 | 16 | 16 | 3 | 16 | 100 | 33 | XHGR18T2... |
| EPH18R016M16.0-3L | 16 | 16 | 3 | 16 | 130 | 56 | XHGR18T2... |
| EPH18R017M16.0-3 | 16 | 17 | 3 | 16 | 130 | 33 | XHGR18T2... |
| EPH18R018M16.0-3 | 16 | 18 | 3 | 16 | 130 | 33 | XHGR18T2... |
| EPH18R020M20.0-3 | 16 | 20 | 3 | 20 | 110 | 41 | XHGR18T2... |
| EPH18R020M20.0-3L | 16 | 20 | 3 | 20 | 140 | 71 | XHGR18T2... |
| EPH18R021M20.0-3 | 16 | 21 | 3 | 20 | 140 | 41 | XHGR18T2... |
| EPH18R025M25.0-4 | 16 | 25 | 4 | 25 | 120 | 51 | XHGR18T2... |
| EPH18R025M25.0-4L | 16 | 25 | 4 | 25 | 160 | 88.5 | XHGR18T2... |
| EPH18R026M25.0-4 | 16 | 26 | 4 | 25 | 160 | 51 | XHGR18T2... |

### SPARE PARTS

| Designation | ①Clamping screw | Wrench | Wrench 1 |
|---|---|---|---|
| EPH11R... | CSP-2L033 | - | IP-6F |
| EPH13R... | CSPB-2.2SH | IP-7D | - |
| EPH18R... | CSPB-2.5SH | IP-7D | - |

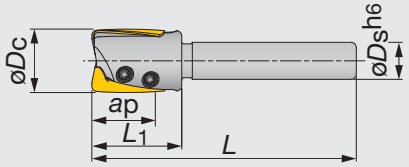


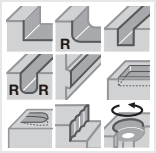
## EPH with slim shank

High precision shoulder square endmills with XHGR type insert slimed shank for small lathes

A.R. = +14.7° ~ +19.5°, R.R. = -14.9° ~ -17.8°





| Designation | Max.ap | øDc | z | øDs | L | L1 | Insert |
|---|---|---|---|---|---|---|---|
| EPH11R010M06.0-2 | 10 | 10 | 2 | 6 | 50 | 15 | XHGR1102... |
| EPH13R012M07.0-2 | 12 | 12 | 2 | 7 | 50 | 17 | XHGR1302... |
| EPH18R016M10.0-3 | 16 | 16 | 3 | 10 | 60 | 22 | XHGR18T2... |
| EPH18R020M10.0-3 | 16 | 20 | 3 | 10 | 60 | 22 | XHGR18T2... |

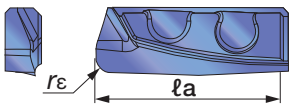
### SPARE PARTS

| Designation | Clamping screw | Wrench | Wrench 1 |
|---|---|---|---|
| EPH11R010M06.0-2 | CSP-2L033 | - | IP-6F |
| EPH13R012M07.0-2 | CSPB-2.2SH | IP-7D | - |
| EPH18R0**M10.0-3 | CSPB-2.5SH | IP-7D | - |

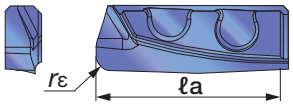
## INSERT

### XHGR11/13/18-AJ






### XHGR11/13/18-MJ




| | | | |
|---|---|---|---|
| P | Steel | ★ | |
| M | Stainless | ★ | |
| K | Cast iron | ★ | |
| N | Non-ferrous | | ★ |
| S | Superalloys | | |
| H | Hard materials | | |

★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | Coating AH730 | Coating DS1200 | ℓa |
|---|---|---|---|---|---|
| XHGR110202ER-MJ | 0.2 | 10 | ● | | 11 |
| XHGR110204ER-MJ | 0.4 | 10 | ● | | 11 |
| XHGR110205ER-MJ | 0.5 | 10 | ● | | 11 |
| XHGR110208ER-MJ | 0.8 | 10 | ● | | 11 |
| XHGR110210ER-MJ | 1 | 10 | ● | | 11 |
| XHGR110212ER-MJ | 1.2 | 10 | ● | | 11 |
| XHGR110215ER-MJ | 1.5 | 10 | ● | | 11 |
| XHGR110216ER-MJ | 1.6 | 10 | ● | | 11 |
| XHGR110220ER-MJ | 2 | 10 | ● | | 11 |
| XHGR130202ER-MJ | 0.2 | 12 | ● | | 13 |
| XHGR130204ER-MJ | 0.4 | 12 | ● | | 13 |
| XHGR130205ER-MJ | 0.5 | 12 | ● | | 13 |
| XHGR130208ER-MJ | 0.8 | 12 | ● | | 13 |
| XHGR130210ER-MJ | 1 | 12 | ● | | 13 |
| XHGR130212ER-MJ | 1.2 | 12 | ● | | 13 |
| XHGR130215ER-MJ | 1.5 | 12 | ● | | 13 |
| XHGR130216ER-MJ | 1.6 | 12 | ● | | 13 |
| XHGR130220ER-MJ | 2 | 12 | ● | | 13 |
| XHGR18T202ER-MJ | 0.2 | 16 | ● | | 18 |
| XHGR18T204ER-MJ | 0.4 | 16 | ● | | 18 |
| XHGR18T205ER-MJ | 0.5 | 16 | ● | | 18 |
| XHGR18T208ER-MJ | 0.8 | 16 | ● | | 18 |
| XHGR18T210ER-MJ | 1 | 16 | ● | | 18 |
| XHGR18T212ER-MJ | 1.2 | 16 | ● | | 18 |
| XHGR18T215ER-MJ | 1.5 | 16 | ● | | 18 |

●: Line-up

| | | | | |
|---|---|---|---|---|
| P | Steel | ★ | | |
| M | Stainless | ★ | | |
| K | Cast iron | ★ | | |
| N | Non-ferrous | | ★ | |
| S | Superalloys | | | |
| H | Hard materials | | | |

★ : First choice
☆ : Second choice

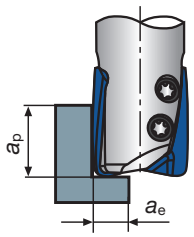
| Designation | rε | Max. ap | Coating | | ℓa |
|---|---|---|---|---|---|
| | | | AH730 | DS1200 | |
| XHGR18T216ER-MJ | 1.6 | 16 | ● | | 18 |
| XHGR18T220ER-MJ | 2 | 16 | ● | | 18 |
| XHGR110200FR-AJ | 0 | 10 | | ● | 11 |
| XHGR110202FR-AJ | 0.2 | 10 | | ● | 11 |
| XHGR110204FR-AJ | 0.4 | 10 | | ● | 11 |
| XHGR110205FR-AJ | 0.5 | 10 | | ● | 11 |
| XHGR110208FR-AJ | 0.8 | 10 | | ● | 11 |
| XHGR110210FR-AJ | 1 | 10 | | ● | 11 |
| XHGR110212FR-AJ | 1.2 | 10 | | ● | 11 |
| XHGR110215FR-AJ | 1.5 | 10 | | ● | 11 |
| XHGR110216FR-AJ | 1.6 | 10 | | ● | 11 |
| XHGR110220FR-AJ | 2 | 10 | | ● | 11 |
| XHGR130200FR-AJ | 0 | 12 | | ● | 13 |
| XHGR130202FR-AJ | 0.2 | 12 | | ● | 13 |
| XHGR130204FR-AJ | 0.4 | 12 | | ● | 13 |
| XHGR130205FR-AJ | 0.5 | 12 | | ● | 13 |
| XHGR130208FR-AJ | 0.8 | 12 | | ● | 13 |
| XHGR130210FR-AJ | 1 | 12 | | ● | 13 |
| XHGR130212FR-AJ | 1.2 | 12 | | ● | 13 |
| XHGR130215FR-AJ | 1.5 | 12 | | ● | 13 |
| XHGR130216FR-AJ | 1.6 | 12 | | ● | 13 |
| XHGR130220FR-AJ | 2 | 12 | | ● | 13 |
| XHGR18T200FR-AJ | 0 | 16 | | ● | 18 |
| XHGR18T202FR-AJ | 0.2 | 16 | | ● | 18 |
| XHGR18T204FR-AJ | 0.4 | 16 | | ● | 18 |
| XHGR18T205FR-AJ | 0.5 | 16 | | ● | 18 |
| XHGR18T208FR-AJ | 0.8 | 16 | | ● | 18 |
| XHGR18T210FR-AJ | 1 | 16 | | ● | 18 |
| XHGR18T212FR-AJ | 1.2 | 16 | | ● | 18 |
| XHGR18T215FR-AJ | 1.5 | 16 | | ● | 18 |
| XHGR18T216FR-AJ | 1.6 | 16 | | ● | 18 |
| XHGR18T220FR-AJ | 2 | 16 | | ● | 18 |

Note: When using inserts with a corner radius in excess of 1mm,additional work to the cutter body is needed.

●: Line-up

# STANDARD CUTTING CONDITIONS

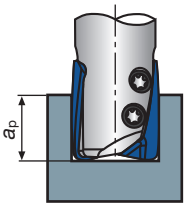
## ● Shoulder milling




ap: Axial depth of cut
ae: Radial depth of cut

| ISO | Workpiece material | Cutting speed *Vc* (m/min) | Feed rate *fz* (mm/t) | Cutting conditions ø10 ≤ ø*Dc* < ø12 | ø12 ≤ ø*Dc* < ø16 | ø16 ≤ ø*Dc* ≤ ø26 |
|---|---|---|---|---|---|---|
| P | Carbon steels Alloy steels < 30HRC | 60 ~ 180 | 0.03 ~ 0.1 | *Vc* = 120 m/mim, *fz* = 0.08 mm/t | | |
| | | | | ap 7.5 mm | ap 9 mm | ap 12 mm |
| | | | | ae 1.5 mm | ae 1.5 mm | ae 2 mm |
| | Alloy steels prehardened steels 30 ~ 40HRC | 50 ~ 150 | 0.03 ~ 0.08 | *Vc* = 100 m/min, *fz* = 0.05 mm/t | | |
| | | | | ap 5.5 mm | ap 6.5 mm | ap 9 mm |
| | | | | ae 1.5 mm | ae 1.5 mm | ae 2 mm |
| M | Stainless steels < 250HB | 50 ~ 150 | 0.03 ~ 0.06 | *Vc* = 100 m/min, *fz* = 0.04 mm/t | | |
| | | | | ap 4.5 mm | ap 5.5 mm | ap 7.5 mm |
| | | | | ae 1.5 mm | ae 1.5 mm | ae 2 mm |
| K | Cast irons | 80 ~ 200 | 0.03 ~ 0.1 | *Vc* = 140 m/min, *fz* = 0.08 mm/t | | |
| | | | | ap 9.5 mm | ap 11.5 mm | ap 15.5 mm |
| | | | | ae 2 mm | ae 2 mm | ae 3 mm |
| N | Aluminium alloys Si < 12% | 100 ~ 300 | 0.03 ~ 0.1 | *Vc* = 200 m/min, *fz* = 0.07 mm/t | | |
| | | | | ap 9.5 mm | ap 11.5 mm | ap 15.5 mm |
| | | | | ae 2 mm | ae 2 mm | ae 3 mm |
| | Aluminium alloys Si > 13% | 80 ~ 180 | 0.03 ~ 0.08 | *Vc* = 130 m/min, *fz* = 0.06 mm/t | | |
| | | | | ap 9.5 mm | ap 11.5 mm | ap 15.5 mm |
| | | | | ae 2 mm | ae 2 mm | ae 3 mm |

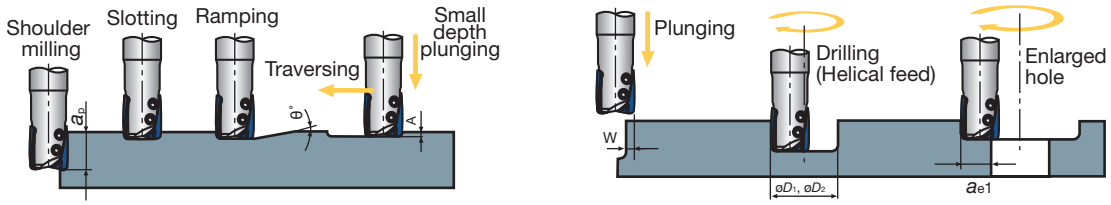
## ● Slotting




| ISO | Workpiece material | Cutting speed *Vc* (m/min) | Feed rate *fz* (mm/t) | Cutting conditions ø10 ≤ ø*Dc* < ø12 | ø12 ≤ ø*Dc* < ø16 | ø16 ≤ ø*Dc* ≤ ø18 | ø18 < ø*Dc* ≤ ø21 | ø21 < ø*Dc* ≤ ø26 |
|---|---|---|---|---|---|---|---|---|
| P | Carbon steels Alloy steels < 30HRC | 60 ~ 180 | 0.03 ~ 0.1 | *Vc* = 100 m/mim, *fz* = 0.06 mm/t | | | | |
| | | | | ap 1.5 mm | ap 2 mm | ap 3 mm | ap 2.5 mm | ap 2.5 mm |
| | Alloy steels prehardened steels 30 ~ 40HRC | 50 ~ 150 | 0.03 ~ 0.08 | *Vc* = 70 m/min, *fz* = 0.05 mm/t | | | | |
| | | | | ap 1 mm | ap 1.5 mm | ap 2 mm | ap 1.5 mm | ap 1.5 mm |
| M | Stainless steels < 250HB | 50 ~ 150 | 0.03 ~ 0.06 | *Vc* = 70 m/min, *fz* = 0.04 mm/t | | | | |
| | | | | ap 1 mm | ap 1 mm | ap 1.5 mm | ap 1.5 mm | ap 1.5 mm |
| K | Cast irons | 80 ~ 200 | 0.03 ~ 0.1 | *Vc* = 120 m/min, *fz* = 0.07 mm/t | | | | |
| | | | | ap 3.5 mm | ap 4 mm | ap 4.5 mm | ap 3.5 mm | ap 3 mm |
| N | Aluminium alloys Si < 12% | 100 ~ 300 | 0.03 ~ 0.1 | *Vc* = 150 m/min, *fz* = 0.07 mm/t | | | | |
| | | | | ap 3.5 mm | ap 4 mm | ap 4.5 mm | ap 3.5 mm | ap 3 mm |
| | Aluminium alloys Si > 13% | 80 ~ 180 | 0.03 ~ 0.08 | *Vc* = 110 m/min, *fz* = 0.06 mm/t | | | | |
| | | | | ap 3.5 mm | ap 4 mm | ap 4.5 mm | ap 3.5 mm | ap 3 mm |

Notes:
- When slotting, use a rigid machine.
- When chips stay in the cutting zone during slotting or pocketing, use air to remove chips from the work area.
- If chips tend to stick to the cutting edge (such as aluminium alloy machining), use a water soluble cutting fluid.
- If cutting a casting skin or heavily interrupted work surface, decrease the feed per tooth and maximum depth of cut to 1/2 to 2/3 times the values shown in the table.
- Tool overhang length must be as short as possible to avoid chatter. When the tool overhang length is long, decrease the number of revolutions and feed.
- Cutting conditions are generally limited by the rigidity and power of the machine and the rigidity of the workpiece. When setting the conditions, start from half of the values of the standard cutting conditions and then increase the value gradually while making sure the machine is running normally.

## APPLICATION RANGE

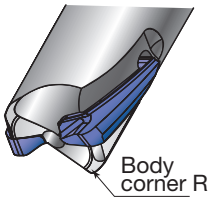



| type | Designation | Tool ø øDc | Max. depth of cut ap | Max. ramping angle θ° | Max. plunging depth A | Max. cutting width in plunging W | Min. machinable hole ø øD1 | Max. machinable hole ø øD2* | Max. cutting width in enlarged hole $a_{e1}$* |
|---|---|---|---|---|---|---|---|---|---|
| Straight | EPH11R010M10.0-2 | 10 | 10 | 3 | 0.3 | 3 | 13 | 19.5 | 9.7 |
| | EPH13R012M12.0-2 | 12 | 12 | 3.5 | 0.3 | 3 | 16 | 23.5 | 11.7 |
| | EPH18R016M16.0-2 | 16 | 16 | 3.5 | 0.3 | 4 | 22 | 31.5 | 15.7 |
| | EPH18R016M16.0-3 | 16 | 16 | 3.5 | 0.3 | 4 | 22 | 31.5 | 15.7 |
| | EPH18R020M20.0-3 | 20 | 16 | 2 | 0.3 | 4 | 29 | 39.5 | 19.7 |
| | EPH18R025M25.0-4 | 25 | 16 | 1.5 | 0.3 | 4 | 39 | 49.5 | 24.7 |
| Long | EPH11R010M10.0-2L | 10 | 10 | 3 | 0.3 | 3 | 13 | 19.5 | 9.7 |
| | EPH13R012M12.0-2L | 12 | 12 | 3.5 | 0.3 | 3 | 16 | 23.5 | 11.7 |
| | EPH18R016M16.0-2L | 16 | 16 | 3.5 | 0.3 | 4 | 22 | 31.5 | 15.7 |
| | EPH18R016M16.0-3L | 16 | 16 | 3.5 | 0.3 | 4 | 22 | 31.5 | 15.7 |
| | EPH18R020M20.0-3L | 20 | 16 | 2 | 0.3 | 4 | 29 | 39.5 | 19.7 |
| | EPH18R025M25.0-4L | 25 | 16 | 1.5 | 0.3 | 4 | 39 | 49.5 | 24.7 |
| Undercut | EPH13R013M12.0-2 | 13 | 12 | 2 | 0.3 | 3 | 17 | 25.5 | 12.7 |
| | EPH13R014M12.0-2 | 14 | 12 | 1.5 | 0.3 | 3 | 19 | 27.5 | 13.7 |
| | EPH18R017M16.0-3 | 17 | 16 | 3 | 0.3 | 4 | 23 | 33.5 | 16.7 |
| | EPH18R018M16.0-3 | 18 | 16 | 2.5 | 0.3 | 4 | 25 | 35.5 | 17.7 |
| | EPH18R021M20.0-3 | 21 | 16 | 2 | 0.3 | 4 | 31 | 41.5 | 20.7 |
| | EPH18R026M25.0-4 | 26 | 16 | 1.5 | 0.3 | 4 | 41 | 51.5 | 25.7 |
| For small lathes | EPH11R010M06.0-2 | 10 | 10 | 3 | 0.3 | 3 | 13 | 19.5 | 9.7 |
| | EPH13R012M07.0-2 | 12 | 12 | 3.5 | 0.3 | 3 | 16 | 23.5 | 11.7 |
| | EPH18R016M10.0-3 | 16 | 16 | 3.5 | 0.3 | 4 | 22 | 31.5 | 15.7 |
| | EPH18R020M10.0-3 | 20 | 16 | 2 | 0.3 | 4 | 29 | 39.5 | 19.7 |

*Where the insert corner radius ≤ 0.2 mm

### Notes on using large radius inserts

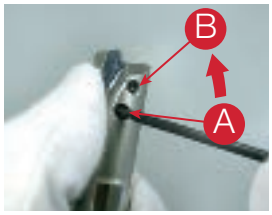
When using the inserts which have a large corner radius in excess of 1.0 mm, additional work is needed to the corner of the body.




| Insert corner radius $r_\varepsilon$ (mm) | Required rework to body corner R (mm) |
|---|---|
| $0 \leq r_\varepsilon \leq 1.0$ | No additional work |
| $1.0 < r_\varepsilon \leq 2.0$ | R2.0 |

### Insert mounting procedure (EPH-type)

**Fasten the inserts in order of Ⓐ to Ⓑ**

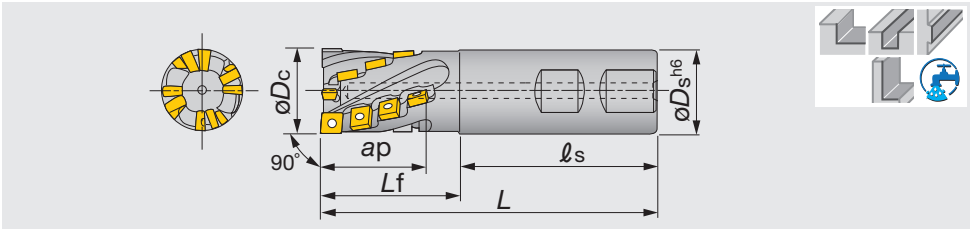



① After loosening the clamping screws, insert the insert in the insert pocket of the body whilst pushing it with your finger.
② Lightly fasten the clamping screws in order of A and B.
③ For all the inserts, carry out the above steps ① and ②.
④ Securely tighten the clamping screws in order of Ⓐ and Ⓑ.
(Refer to the standard tightening torque values.)
⑤ For all the inserts, carry out the above step ④.
⑥ Check the condition of insert seating, clearance between the insert and insert pocket, the tool diameter, and the peripheral edge runout.

## ELP

Square shoulder endmills with long cutting edge for roughingoperation






| Designation | ap | øDc | z eff | øDs | ℓs | Lf | L | Air hole | End cutting edge inserts | Both end and peripheral edge inserts |
|---|---|---|---|---|---|---|---|---|---|---|
| ELP07032R-A | 38 | 32 | 2 | 32 | 80 | 60 | 140 | with | ACMT0603... (2) | APMT0703... (14) |
| ELP07032R | 38 | 32 | 2 | 32 | 80 | 60 | 140 | without | ACMT0603... (2) | APMT0703... (14) |
| ELP07040R-A | 44 | 40 | 2 | 42 | 80 | 70 | 150 | with | ACMT0603... (2) | APMT0703... (16) |
| ELP07040R | 44 | 40 | 2 | 42 | 80 | 70 | 150 | without | ACMT0603... (2) | APMT0703... (16) |
| ELP09040R-A | 48 | 40 | 2 | 42 | 80 | 70 | 150 | with | ACMT07T3... (2) | APMT09T3... (14) |
| ELP09040R | 48 | 40 | 2 | 42 | 80 | 70 | 150 | without | ACMT07T3... (2) | APMT09T3... (14) |
| ELP09050R-A | 56 | 50 | 2 | 42 | 80 | 80 | 160 | with | ACMT07T3... (2) | APMT09T3... (16) |
| ELP09050R | 56 | 50 | 2 | 42 | 80 | 80 | 160 | without | ACMT07T3... (2) | APMT09T3... (16) |
| ELP12050R-A | 58 | 50 | 2 | 42 | 80 | 80 | 160 | with | ACMT1004... (2) | APMT1204... (12) |
| ELP12050R | 58 | 50 | 2 | 42 | 80 | 80 | 160 | without | ACMT1004... (2) | APMT1204... (12) |
| ELP12063R-A | 68 | 63 | 2 | 42 | 80 | 90 | 170 | with | ACMT1004... (2) | APMT1204... (14) |
| ELP12063R | 68 | 63 | 2 | 42 | 80 | 90 | 170 | without | ACMT1004... (2) | APMT1204... (14) |

● () is the number of used insert

### SPARE PARTS




| Designation | Clamping screw | Wrench |
|---|---|---|
| ELP07... | CSTB-2.5 | T-8D |
| ELP09... | CSTB-3 | T-9D |
| ELP12... | CSTB-4M | T-15D |

## ELP**RA

| Designation | ap | øDc | z eff | øDs | ℓs | Lf | L | Air hole | End cutting edge inserts | Both end and peripheral edge inserts |
|---|---|---|---|---|---|---|---|---|---|---|
| ELP13025RA-A | 28 | 25 | 2 | 25 | 90 | 40 | 130 | with | ADMT1303... (1) | APMT0703... (4) |
| ELP13025RA | 28 | 25 | 2 | 25 | 90 | 40 | 130 | without | ADMT1303... (1) | APMT0703... (4) |
| ELP17032RA-A | 35 | 32 | 2 | 32 | 90 | 50 | 140 | with | ADMT17T3... (1) | APMT09T3... (4) |
| ELP17032RA | 35 | 32 | 2 | 32 | 90 | 50 | 140 | without | ADMT17T3... (1) | APMT09T3... (4) |
| ELP21040RA-A | 44 | 40 | 2 | 42 | 90 | 60 | 150 | with | ADMT2104... (1) | APMT1204... (4) |
| ELP21040RA | 44 | 42 | 2 | 40 | 90 | 60 | 150 | without | ADMT2104... (1) | APMT1204... (4) |

● () is the number of used insert

### SPARE PARTS



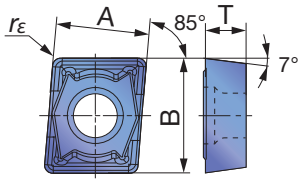




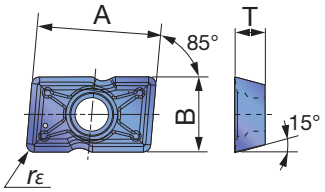
| Designation | Clamping screw | Clamping screw 1 | Lubricant | Wrench | Wrench 1 |
|---|---|---|---|---|---|
| ELP13... | CSPD-3 | CSPB-2.5 | M-1000 | IP-10D | IP-8D |
| ELP17... | CSPD-3 | CSPB-4S | M-1000 | IP-10D | IP-15D |
| ELP21... | CSTB-5 | CSPB-4 | M-1000 | IP-15D | T-20D |

## INSERT

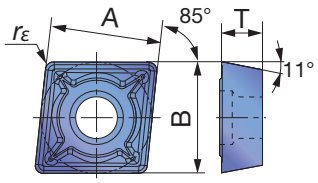
### ACMT06/07/10-MJ




### ADMT13/17/21-MJ




### APMT07/09/12-MJ




| | | | | | | |
|---|---|---|---|---|---|---|
| P | Steel | ★ | | ☆ | ★ | |
| M | Stainless | | ★ | | | |
| K | Cast iron | ★ | | | | |
| N | Non-ferrous | | | | | |
| S | Superalloys | ★ | | | | |
| H | Hard materials | | | | | |

★ : First choice
☆ : Second choice

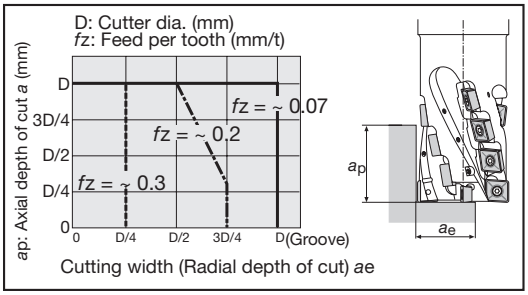
| Designation | rε | Coating | | | | A | B | T |
|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH140 | GH330 | T3130 | | | |
| ACMT060308PR-MJ | 0.8 | ● | ● | ● | ● | 6 | 7.8 | 3.18 |
| ACMT07T308PR-MJ | 0.8 | ● | ● | ● | ● | 7.5 | 9.5 | 3.97 |
| ACMT100408PR-MJ | 0.8 | ● | ● | ● | ● | 10 | 12.7 | 4.76 |
| ADMT130308PR-MJ | 0.8 | ● | ● | | ● | 13.1 | 8 | 3.18 |
| ADMT17T308PR-MJ | 0.8 | ● | ● | | ● | 16.6 | 9.5 | 3.97 |
| ADMT210408PR-MJ | 0.8 | ● | ● | | ● | 20.6 | 12.7 | 4.76 |
| APMT070308PN-MJ | 0.8 | ● | ● | ● | ● | 7.9 | 7.9 | 3.18 |
| APMT09T308PN-MJ | 0.8 | ● | ● | ● | ● | 9.5 | 9.5 | 3.97 |
| APMT120408PN-MJ | 0.8 | ● | ● | ● | ● | 12.7 | 12.7 | 4.76 |

●: Line-up

# STANDARD CUTTING CONDITIONS

## ELP type

| ISO | Workpiece material | Grade | Cutter diameter (mm) ø32 Vc (m/min) | ø32 fz (mm/t) | ø40 Vc (m/min) | ø40 fz (mm/t) | ø50 Vc (m/min) | ø50 fz (mm/t) | ø63 Vc (m/min) | ø63 fz (mm/t) |
|---|---|---|---|---|---|---|---|---|---|---|
| P | Mild steels, Low carbon steels E275A, C15E4, etc. | T3130 (AH120) | 60 ~ 150 | 0.1 ~ 0.3 | 70 ~ 150 | 0.1 ~ 0.3 | 70 ~ 150 | 0.1 ~ 0.3 | 70 ~ 150 | 0.1 ~ 0.3 |
| P | High carbon steels, Alloy steels C55, 42CrMo4, etc. | T3130 (AH120) | 60 ~ 120 | 0.1 ~ 0.3 | 60 ~ 120 | 0.1 ~ 0.3 | 60 ~ 150 | 0.1 ~ 0.3 | 60 ~ 150 | 0.1 ~ 0.3 |
| P | Die steels X153CrMoV12, etc. | T3130 (AH120) | 60 ~ 100 | 0.1 ~ 0.3 | 60 ~ 100 | 0.1 ~ 0.3 | 60 ~ 120 | 0.1 ~ 0.3 | 60 ~ 120 | 0.1 ~ 0.3 |
| M | Stainless steels X5CrNi18-9, X5CrNiMo17-12-3, etc. | AH140 | 70 ~ 120 | 0.1 ~ 0.3 | 60 ~ 120 | 0.1 ~ 0.3 | 60 ~ 120 | 0.1 ~ 0.3 | 60 ~ 120 | 0.1 ~ 0.3 |
| K | Cast irons 250, 450-10S, etc. | AH120 | 60 ~ 150 | 0.1 ~ 0.3 | 60 ~ 150 | 0.1 ~ 0.3 | 60 ~ 150 | 0.1 ~ 0.3 | 60 ~ 150 | 0.1 ~ 0.3 |




- *Vc*: Cutting speed
- *fz*: Feed per tooth (Feed per revolution is *fz* × 2 as effective number of teeth is equal to two)

Notes :
- Dry cutting (or air-blowing) is generally recommended. When chips tend to adhere to the cutting edges such as in milling stainless steel, use a water-soluble cutting fluid.
- When the cutting width is larger than a half of the cutter diameter or chips tend to stay in the cutting area, use an air blast to remove chips.
- To get the best of the tool performance, use of a high-accuracy, side-lock type toolholder or milling chuck which has a high gripping force is recommended. Excessive tool overhang from the toolholder should be avoided to prevent chatter.

- No. of revolutions ($min^{-1}$) = Cutting speed × 1000 ÷ 3.14 ÷ Cutter diameter
- Table feed (mm/min) = No. of revolutions × Feed per tooth × No. of inserts

## ELP**RA type

| ISO | Workpiece material | Grade | Cutter diameter (mm) ø25 Vc (m/min) | ø25 fz (mm/t) | ø32 Vc (m/min) | ø32 fz (mm/t) | ø40 Vc (m/min) | ø40 fz (mm/t) |
|---|---|---|---|---|---|---|---|---|
| P | Mild steels, Low carbon steels E275A, C15E4, etc. | T3130 (AH120) | 60 ~ 150 | 0.08 ~ 0.2 | 60 ~ 150 | 0.1 ~ 0.3 | 60 ~ 150 | 0.1 ~ 0.3 |
| P | High carbon steels, Alloy steels C55, 42CrMo4, etc. | T3130 (AH120) | 60 ~ 120 | 0.08 ~ 0.2 | 60 ~ 120 | 0.1 ~ 0.3 | 60 ~ 120 | 0.1 ~ 0.3 |
| P | Die steels X153CrMoV12, etc. | T3130 (AH120) | 60 ~ 100 | 0.08 ~ 0.2 | 60 ~ 100 | 0.1 ~ 0.3 | 60 ~ 100 | 0.1 ~ 0.3 |
| M | Stainless steels X5CrNi18-9, etc. | AH140 | 70 ~ 120 | 0.08 ~ 0.2 | 70 ~ 120 | 0.1 ~ 0.3 | 70 ~ 120 | 0.1 ~ 0.3 |
| K | Cast irons 250, 450-10S, etc. | AH120 | 60 ~ 150 | 0.08 ~ 0.2 | 60 ~ 150 | 0.1 ~ 0.3 | 60 ~ 150 | 0.1 ~ 0.3 |

- *Vc*: Cutting speed
- *fz*: Feed per tooth (Feed per revolution is *fz* × 2 as effective number of teeth is equal to two)

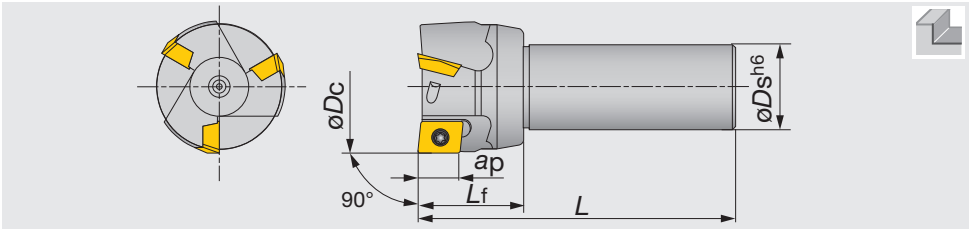
Notes :
- To get the best of the tool's performance, use of a high-accuracy, side-lock type toolholder or milling chuck which has a high gripping force is recommended.
- Excessive tool overhang from the toolholder should be avoided to prevent chatter.

## EPE4000,5000,6000

High precision shoulder square endmills with AECW inserts

A.R. = +12° ~ +17°, R.R. = -10° ~ 0°





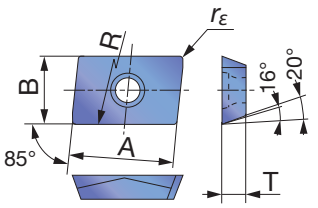

| Designation | Max. *ap* | ø*D*c | z | ø*D*s | *L*f | *L* | Insert |
|---|---|---|---|---|---|---|---|
| EPE4020R | 12 | 20 | 1 | 20 | 30 | 100 | AE*W14... |
| EPE4025R | 12 | 25 | 2 | 25 | 35 | 115 | AE*W14... |
| EPE5030R | 14 | 30 | 2 | 32 | 40 | 120 | AE*W16... |
| EPE5035R | 14 | 35 | 2 | 32 | 40 | 120 | AE*W16... |
| EPE5040R | 14 | 40 | 2 | 32 | 40 | 120 | AE*W16... |
| EPE6050R | 16 | 50 | 3 | 32 | 40 | 120 | AE*W18... |
| EPE6063R | 16 | 63 | 4 | 32 | 45 | 125 | AE*W18... |

### SPARE PARTS

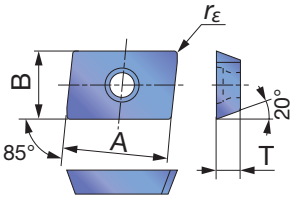
| Designation | Clamping screw | Wrench |
|---|---|---|
| EPE402*R | CSTB-3S | T-9D |
| EPE50**R | CSTB-4S | T-15D |
| EPE60**R | CSTB-4M | T-15D |

## INSERT

### AECW14/16/18




### AEMW14/16/18




| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ★ | ★ | | ★ | | ☆ | | |
| M | Stainless | ★ | ★ | | | | | | |
| K | Cast iron | ★ | ★ | | | | | | |
| N | Non-ferrous | | | | | | | ★ | |
| S | Superalloys | ★ | | | | | | | |
| H | Hard materials | | | | | | | | |

★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | Coating | | Cermet | Uncoated | | A | B | T |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | AH120 | GH330 | NS740 | UX30 | TH10 | | | |
| AECW1403PEFR | 0.4 | 12 | | | | | ● | 14 | 9 | 3.18 |
| AECW1403PESR | 0.4 | 12 | ● | ● | ● | ● | | 14 | 9 | 3.18 |
| AECW16T3PEFR | 0.4 | 14 | | | | | ● | 16 | 12 | 3.97 |
| AECW16T3PESR | 0.4 | 14 | ● | ● | ● | ● | | 16 | 12 | 3.97 |
| AECW1804PEFR | 0.4 | 16 | | | | | ● | 18 | 12 | 4.76 |
| AECW1804PESR | 0.4 | 16 | ● | ● | ● | ● | | 18 | 12 | 4.76 |
| AEMW1403PEFR | 0.4 | 12 | | | | | ● | 14 | 8.9 | 3.18 |
| AEMW1403PETR | 0.4 | 12 | | ● | ● | ● | | 14 | 8.9 | 3.18 |
| AEMW16T3PEFR | 0.4 | 14 | | | | | ● | 16 | 11.9 | 3.97 |
| AEMW16T3PETR | 0.4 | 14 | | ● | ● | ● | | 16 | 11.9 | 3.97 |
| AEMW1804PEFR | 0.4 | 16 | | | | | ● | 18 | 11.9 | 4.76 |
| AEMW1804PETR | 0.4 | 16 | | ● | ● | ● | | 18 | 11.9 | 4.76 |

●: Line-up

## STANDARD CUTTING CONDITIONS

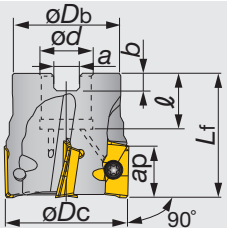
| ISO | Workpiece material | Grade | Cutting speed *Vc* (m/min) | | Feed per tooth *fz* (mm/t) |
|---|---|---|---|---|---|
| | | | ø20 ~ 35 mm | ø40 ~ 63 mm | |
| P | Mild steels·Unhardened steels<br>< 180 HB<br>C15E4, E275A, etc. | AH120 · GH330 | 80 ~ 150 | 130 ~ 230 | 0.1 ~ 0.2 |
| | | NS740 | 100 ~ 150 | 130 ~ 180 | 0.1 ~ 0.15 |
| | | UX30 | 80 ~ 150 | 100 ~ 150 | 0.1 ~ 0.2 |
| | Carbon steels, Alloy steels<br>< 300HB<br>C55, 42CrMo4, etc. | AH120 · GH330 | 80 ~ 100 | 100 ~ 200 | 0.1 ~ 0.2 |
| | | NS740 | 80 ~ 100 | 100 ~ 150 | 0.1 ~ 0.15 |
| | | UX30 | 80 ~ 100 | 80 ~ 120 | 0.1 ~ 0.2 |
| | Die steels<br>< 300HB | AH120 · GH330<br>NS740 | 80 ~ 100 | 100 ~ 120 | 0.1 ~ 0.15 |
| M | Stainless steels<br>X5CrNi18-9, etc. | AH120 · GH330 | 100 ~ 200 | 120 ~ 200 | 0.1 ~ 0.2 |
| K | Cast irons<br>Ductile cast irons | TH10 | 80 ~ 100 | 80 ~ 100 | 0.1 ~ 0.15 |
| | | AH120 | 80 ~ 150 | 80 ~ 150 | 0.1 ~ 0.2 |
| N | Aluminium alloys<br>Si < 13% | TH10 | 200 ~ 300 | 300 ~ 500 | 0.1 ~ 0.25 |

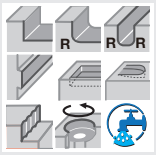
MEMO

## TPS17

Shoulder square mills with ASMT/ASGT17 inserts, suitable formulti perpose machining





Right hand (R) shown.

| Designation | Max. *ap* | *øDc* | z | *Lf* | *ød* | *ℓ* | *a* | *b* | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TPS17040RB-E | 16.2 | 40 | 4 | 40 | 16 | 19 | 8.4 | 5.6 | 0.2 | without | AS*T1705... |
| TPS17050RB-E | 16.1 | 50 | 5 | 40 | 22 | 20 | 10.4 | 6.3 | 0.3 | without | AS*T1705... |
| TPS17063RB-E | 16 | 63 | 6 | 45 | 22 | 20 | 10.4 | 6.3 | 0.6 | without | AS*T1705... |

**SPARE PARTS**

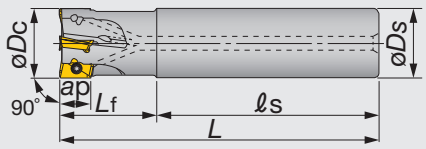
| Designation | Clamping screw | Lubricant | Shell locking bolt | Shell locking bolt 1 | Shell locking bolt 2 | Wrench |
|---|---|---|---|---|---|---|
| TPS17040RB-E | CSPB-4S | M-1000 | - | - | FSHM8-30 | IP-15D |
| TPS17050RB-E | CSPB-4S | M-1000 | - | - | CAP-CM10X1.5X30 | IP-15D |
| TPS17063RB-E | CSPB-4S | M-1000 | - | - | CAP-CM10X1.5X30 | IP-15D |

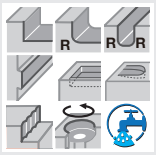
## EPS17

Shoulder square endmills with ASMT/ASGT17 inserts

A.R. = +9°~ +17° ,R.R. = -20°~ -7°





Right hand (R) shown.

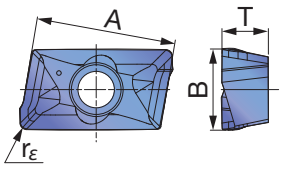
| Designation | Max. *ap* | *øDc* | z | *øDs* | *ℓs* | *Lf* | *L* | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|
| EPS17025RS | 16.3 | 25 | 2 | 25 | 80 | 35 | 115 | with | AS*T1705... |
| EPS17025RL | 16.3 | 25 | 2 | 25 | 150 | 70 | 220 | with | AS*T1705... |
| EPS17026RS | 16.3 | 26 | 2 | 25 | 80 | 35 | 115 | with | AS*T1705... |
| EPS17026RL | 16.3 | 26 | 2 | 25 | 150 | 70 | 220 | with | AS*T1705... |
| EPS17030RS | 16.2 | 30 | 2 | 25 | 80 | 35 | 115 | with | AS*T1705... |
| EPS17030RSB | 16.2 | 30 | 3 | 25 | 80 | 35 | 115 | with | AS*T1705... |
| EPS17030RL | 16.2 | 30 | 2 | 25 | 150 | 70 | 220 | with | AS*T1705... |
| EPS17032RSB-E | 16.2 | 32 | 3 | 32 | 70 | 40 | 110 | with | AS*T1705... |
| EPS17032RS | 16.2 | 32 | 2 | 32 | 80 | 40 | 120 | with | AS*T1705... |
| EPS17032RSB | 16.2 | 32 | 3 | 32 | 80 | 40 | 120 | with | AS*T1705... |
| EPS17032RL | 16.2 | 32 | 2 | 32 | 175 | 80 | 255 | with | AS*T1705... |
| EPS17033RS | 16.2 | 33 | 2 | 32 | 80 | 40 | 120 | with | AS*T1705... |
| EPS17033RSB | 16.2 | 33 | 3 | 32 | 80 | 40 | 120 | with | AS*T1705... |
| EPS17033RL | 16.2 | 33 | 2 | 32 | 175 | 80 | 255 | with | AS*T1705... |
| EPS17040RS | 16.2 | 40 | 3 | 32 | 80 | 40 | 120 | with | AS*T1705... |
| EPS17040RSB | 16.2 | 40 | 4 | 32 | 80 | 40 | 120 | with | AS*T1705... |
| EPS17040RL | 16.2 | 40 | 2 | 32 | 205 | 50 | 255 | with | AS*T1705... |
| EPS17040RLS42 | 16.2 | 40 | 2 | 42 | 210 | 100 | 310 | with | AS*T1705... |
| EPS17050RSB | 16.1 | 50 | 5 | 32 | 80 | 40 | 120 | with | AS*T1705... |
| EPS17050RL | 16.1 | 50 | 3 | 42 | 310 | 50 | 360 | with | AS*T1705... |
| EPS17063RSB | 16 | 63 | 6 | 32 | 80 | 45 | 125 | with | AS*T1705... |
| EPS17063RL | 16 | 63 | 3 | 42 | 310 | 50 | 360 | with | AS*T1705... |

**SPARE PARTS**

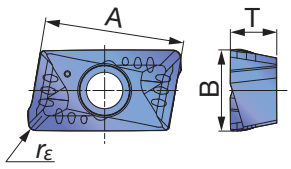
| Designation | Clamping screw | Lubricant | Wrench |
|---|---|---|---|
| EPS17 | CSPB-4S | M-1000 | IP-15D |

## INSERT

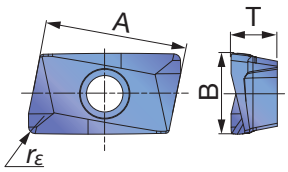
### ASMT17-MJ




### ASMT17-MS




### ASGT17-AJ




| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ★ | | | | ★ | | | ★ | | | |
| M | Stainless | | ★ | ★ | | | | | | | | |
| K | Cast iron | ★ | | | ★ | | | | | | | |
| N | Non-ferrous | | | | | | ★ | | | | ★ | |
| S | Superalloys | ★ | ★ | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | |

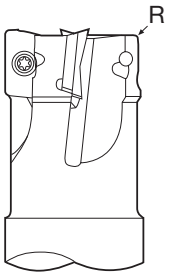
★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | Coating | | | | | | | Cermet | | Un-coated | | | | | | | | A | B | T |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | AH120 | AH130 | AH140 | T1115 | T3130 | DS1100 | | NS740 | | KS05F | | | | | | | | | | |
| ASMT170504PDPR-MJ | 0.4 | 16 | ● | | | ● | ● | | | ● | | | | | | | | | | 16.9 | 9.8 | 5.6 |
| ASMT170508PDPR-MJ | 0.8 | 16 | ● | | | ● | ● | | | ● | | | | | | | | | | 16.9 | 9.8 | 5.6 |
| ASMT170512PDPR-MJ | 1.2 | 16 | ● | | | | ● | | | | | | | | | | | | | 16.9 | 9.8 | 5.6 |
| ASMT170516PDPR-MJ | 1.6 | 16 | ● | | | | ● | | | ● | | | | | | | | | | 16.9 | 9.8 | 5.6 |
| ASMT170520PDPR-MJ | 2 | 16 | ● | | | | | | | | | | | | | | | | | 16.9 | 9.8 | 5.6 |
| ASMT170530PDPR-MJ | 3 | 16 | ● | | | | | | | | | | | | | | | | | 16.9 | 9.8 | 5.6 |
| ASMT170532PDPR-MJ | 3.2 | 16 | ● | | | | ● | | | ● | | | | | | | | | | 16.9 | 9.8 | 5.6 |
| ASMT170508PDPR-MS | 0.8 | 16 | | ● | ● | | | | | | | | | | | | | | | 16.9 | 9.8 | 5.6 |
| ASGT170504PDFR-AJ | 0.4 | 16 | | | | | | ● | | | | ● | | | | | | | | 16.9 | 9.8 | 5.6 |
| ASGT170508PDFR-AJ | 0.8 | 16 | | | | | | ● | | | | ● | | | | | | | | 16.9 | 9.8 | 5.6 |

●: Line-up

## CAUTIONARY POINT IN MODIFYING CUTTER BODIES

When using inserts with corner radius $r_\varepsilon \geq 2.0$ mm, standard cutter bodies have to be modified "R".



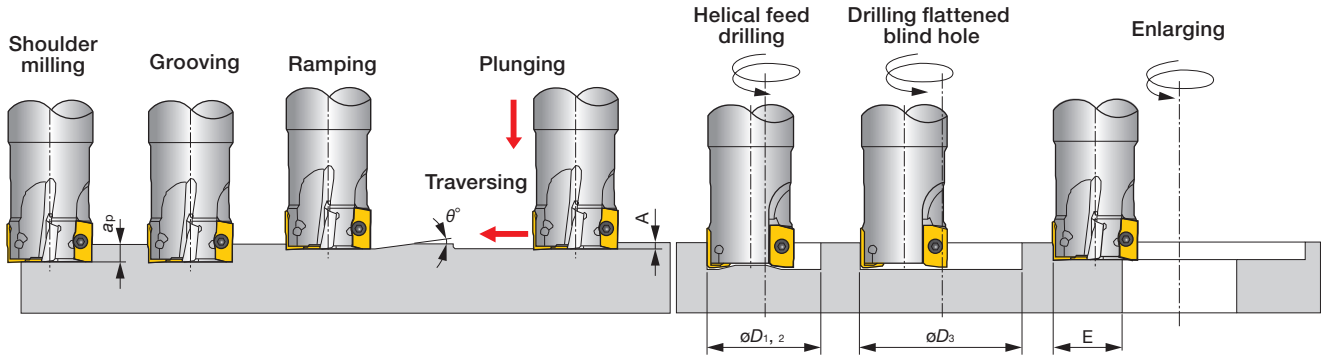

| Corner radius $r_\varepsilon$ (mm) | The dimension of modifying (mm) |
|---|---|
| 0.4 ~ 1.6 | Unnecessary |
| 2.0 ~ 3.2 | 2 |

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Grade | Chip-breaker | Cutting speed *Vc* (m/min) | | | Feed per tooth *fz* (mm/t) | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Cutter dia. ø12 | Cutter dia. ø16, ø20 | Cutter dia. > ø25 | Cutter dia. ø12 | Cutter dia. ø16, ø20 | Cutter dia. > ø25 |
| P | Mild steel, Low Carbon steels C10, E275A, etc. < 180HB | NS740 | MJ | 80 ~ 100 | 100 ~ 120 | 100 ~ 150 | 0.05 ~ 0.08 | 0.05 ~ 0.12 | 0.05 ~ 0.15 |
| | | AH120 | MJ | 80 ~ 100 | 100 ~ 150 | 100 ~ 150 | 0.05 ~ 0.1 | 0.12 ~ 0.2 | 0.12 ~ 0.2 |
| | Carbon steels, Alloy steels C55, 42CrMo4, etc. < 300HB | NS740 | MJ | 80 ~ 100 | 80 ~ 100 | 80 ~ 120 | 0.05 ~ 0.08 | 0.05 ~ 0.08 | 0.05 ~ 0.1 |
| | | T3130 | MJ | 80 ~ 100 | 80 ~ 120 | 100 ~ 200 | 0.05 ~ 0.1 | 0.10 ~ 0.15 | 0.1 ~ 0.2 |
| | Die steels X96CrMoV12, etc. < 300HB | T3130 | MJ | 80 ~ 100 | 80 ~ 120 | 100 ~ 150 | 0.05 ~ 0.1 | 0.1 ~ 0.15 | 0.12 ~ 0.2 |
| M | Stainless steels X5CrNi18-9, etc. < 250HB | AH130 | MS | 80 ~ 100 | 100 ~ 150 | 100 ~ 200 | 0.05 ~ 0.1 | 0.12 ~ 0.15 | 0.12 ~ 0.2 |
| K | Grey Cast irons, DuctileCast irons etc. 250, 400-15S, etc. | T1115 | MJ | 80 ~ 100 | 100 ~ 150 | 100 ~ 200 | 0.08 ~ 0.12 | 0.12 ~ 0.2 | 0.15 ~ 0.25 |
| N | Aluminium alloys Si < 13% | DS1100 | AJ | 300 ~ 1000 | 300 ~ 1000 | 300 ~ 1000 | 0.05 ~ 0.2 | 0.05 ~ 0.2 | 0.05 ~ 0.2 |
| | Aluminium alloys Si ≥ 13% | DS1100 | AJ | 100 ~ 200 | 100 ~ 200 | 100 ~ 200 | 0.05 ~ 0.2 | 0.05 ~ 0.2 | 0.05 ~ 0.2 |
| | Copper alloys | KS05F | AJ | 200 ~ 500 | 200 ~ 500 | 200 ~ 500 | 0.05 ~ 0.2 | 0.05 ~ 0.2 | 0.05 ~ 0.2 |

Notes:
- When using at L/D ≥ 4, machining at the lower feed rate.
- This TAC mill is not designed to cope with the centrifugal force and dynamic balance at high speeds over 1000 m/min. Therefore, the cutting speed in the outer diameter of the mill should not exceed 1000 m/min.

## APPLICATION RANGE



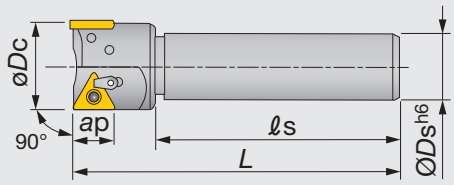

| Designation | Tool ø | Max. depth of cut ap (mm) | Max. ramping angle θ° | Max. plunging depth A (mm) | Min. machining hole dia. øD1 (mm)* | Max. machining hole dia. øD2 (mm)* | Hole dia. in drilling (Blind hole) øD3 (mm)* | Max. cutting width in enlarging hole E (mm) |
|---|---|---|---|---|---|---|---|---|
| EPS17025RS/L | 25 | 16.3 | 5 | 1 | 32 | 48 | 46 ~ 48 | 24 |
| EPS17026RS/L | 26 | 16.3 | 5 | 1 | 34 | 51 | 49 ~ 51 | 25.5 |
| EPS17030RS/B/L | 30 | 16.2 | 4 | 1 | 42 | 59 | 57 ~ 59 | 29.5 |
| EPS17032RS/B/L | 32 | 16.2 | 3.5 | 1 | 46 | 62 | 60 ~ 62 | 31 |
| EPS17033RS/B/L | 33 | 16.2 | 3.5 | 1 | 48 | 65 | 63 ~ 65 | 32.5 |
| E/TPS17040RS/B/L | 40 | 16.2 | 2.5 | 1 | 62 | 78 | 76 ~ 78 | 39 |
| EPS17040RLS42 | 40 | 16.2 | 2.5 | 1 | 62 | 78 | 76 ~ 78 | 39 |
| E/TPS17050RS/B/L | 50 | 16.1 | 1.5 | 1 | 82 | 98 | 96 ~ 98 | 49 |
| E/TPS17063RS/B/L | 63 | 16 | 1 | 1 | 108 | 124 | 122 ~ 124 | 62 |

Notes : Corner $t_\varepsilon$ for dimensions of øD1, øD2, and øD3: $r_\varepsilon = 0.8$

## Square shoulder endmills with triangle inserts

A.R. = +3°~ +5°, R.R. = -8°~ 0°






| Designation | Max. *ap* | *øDc* | z | *øDs* | *ℓs* | *L* | Insert |
|---|---|---|---|---|---|---|---|
| PES1535R | 19 | 35 | 2 | 32 | 120 | 160 | TP*A43... |
| PES1540R | 19 | 40 | 2 | 32 | 120 | 160 | TP*A43... |
| PES1550R | 19 | 50 | 3 | 32 | 120 | 160 | TP*A43... |

**SPARE PARTS**

| Designation | Clamp set | Clamping screw | Wrench |
|---|---|---|---|
| PES15... | CSG-5T | CSTA-4 | T-15D |

## INSERT

### TPCA/TPMA

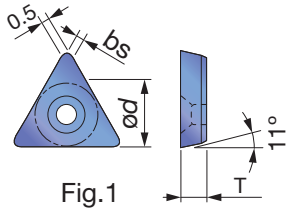



Fig.1

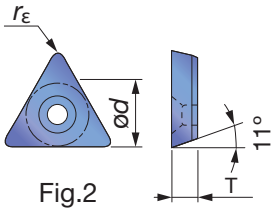



Fig.2

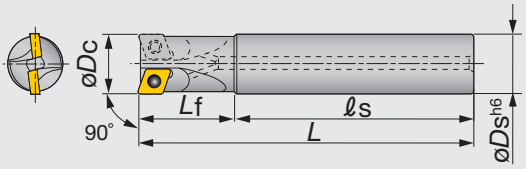
| | | | Cermet | Uncoated | | |

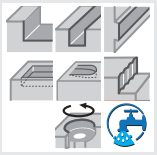
## ESD10,17

Multi purpose square endmills

ESD10 A.R.=+8.5°~+10°,R.R.=-10°~-5°
ESD17 A.R.=+10°,R.R.=-5°~-3°





| Designation | Max. *ap* | *øDc* | z | *øDs* | *ℓs* | *Lf* | *L* | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|
| ESD10020RSA | 9 | 20 | 1 | 20 | 90 | 30 | 120 | with | GD*T10... |
| ESD10020RS | 9 | 20 | 1 | 20 | 90 | 30 | 120 | without | GD*T10... |
| ESD10020RLA | 9 | 20 | 1 | 20 | 135 | 50 | 185 | with | GD*T10... |
| ESD10020RL | 9 | 20 | 1 | 20 | 135 | 50 | 185 | without | GD*T10... |
| ESD10025RSA | 9 | 25 | 2 | 25 | 100 | 40 | 140 | with | GD*T10... |
| ESD10025RS | 9 | 25 | 2 | 25 | 100 | 40 | 140 | without | GD*T10... |
| ESD10025RLA | 9 | 25 | 2 | 25 | 150 | 70 | 220 | with | GD*T10... |
| ESD10025RL | 9 | 25 | 2 | 25 | 150 | 70 | 220 | without | GD*T10... |
| ESD10032RSA | 9 | 32 | 2 | 32 | 110 | 50 | 160 | with | GD*T10... |
| ESD10032RS | 9 | 32 | 2 | 32 | 110 | 50 | 160 | without | GD*T10... |
| ESD10032RLA | 9 | 32 | 2 | 32 | 175 | 80 | 255 | with | GD*T10... |
| ESD10032RL | 9 | 32 | 2 | 32 | 175 | 80 | 255 | without | GD*T10... |
| ESD17040RSA | 15 | 40 | 2 | 42 | 120 | 60 | 180 | with | GD*T17... |
| ESD17040RS | 15 | 40 | 2 | 42 | 120 | 60 | 180 | without | GD*T17... |
| ESD17040RLA | 15 | 40 | 2 | 42 | 210 | 100 | 310 | with | GD*T17... |
| ESD17040RL | 15 | 40 | 2 | 42 | 210 | 100 | 310 | without | GD*T17... |
| ESD17050RSA | 15 | 50 | 2 | 42 | 160 | 50 | 210 | with | GD*T17... |
| ESD17050RS | 15 | 50 | 2 | 42 | 160 | 50 | 210 | without | GD*T17... |
| ESD17050RLA | 15 | 50 | 2 | 42 | 310 | 50 | 360 | with | GD*T17... |
| ESD17050RL | 15 | 50 | 2 | 42 | 310 | 50 | 360 | without | GD*T17... |
| ESD17063RSA | 15 | 63 | 3 | 42 | 190 | 50 | 240 | with | GD*T17... |
| ESD17063RS | 15 | 63 | 3 | 42 | 190 | 50 | 240 | without | GD*T17... |
| ESD17063RLA | 15 | 63 | 3 | 42 | 310 | 50 | 360 | with | GD*T17... |
| ESD17063RL | 15 | 63 | 3 | 42 | 310 | 50 | 360 | without | GD*T17... |

### SPARE PARTS

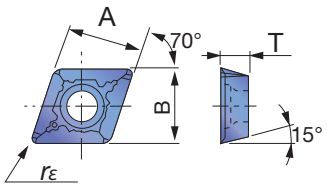




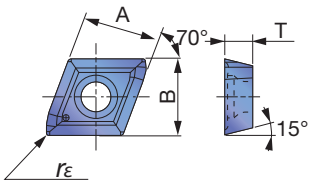
| Designation | Clamping screw | Lubricant | Wrench |
|---|---|---|---|
| ESD100**R** | CSTB-3.5H | M-1000 | T-15D |
| ESD170**R** | CSTB-5 | M-1000 | T-20D |

## INSERT

### GDMT10/17-MJ




### GDGT10/17-AJ




| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ★ | | ★ | ★ | | | ☆ | | |
| M | Stainless | | ★ | | | | | | | |
| K | Cast iron | ★ | | | | | | | | |
| N | Non-ferrous | | | | | ★ | | | ★ | |
| S | Superalloys | ★ | | | | | | | | |
| H | Hard materials | | | | | | | | | |

★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | Coating | | | | | Uncoated | | A | B | T |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | AH120 | AH140 | AH330 | T3130 | DS1100 | UX30 | TH10 | | | |
| GDMT10H3PDPR-MJ | 0.8 | 9 | ● | ● | ● | ● | | ● | | 10 | 10 | 3.5 |
| GDMT17X6PDPR-MJ | 1.2 | 15 | ● | ● | ● | ● | | ● | | 16 | 16 | 6 |
| GDGT10H3PDFR-AJ | 0.4 | 9 | | | | | ● | | ● | 10 | 10 | 3.5 |
| GDGT17X6PDFR-AJ | 0.8 | 15 | | | | | ● | | ● | 16 | 16 | 6 |

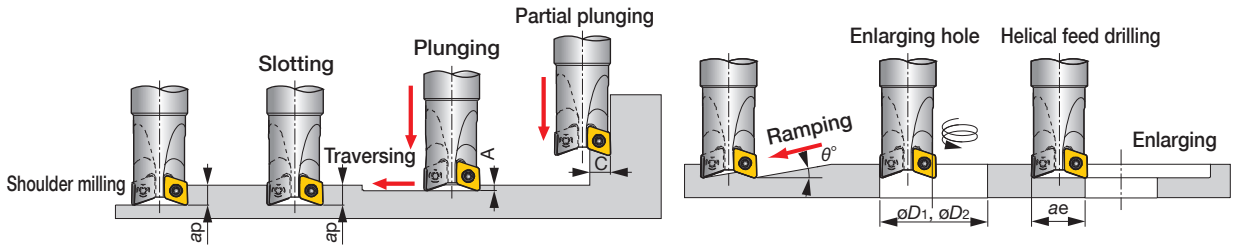
●: Line-up

## STANDARD CUTTING CONDITIONS



| ISO | Workpiece material | Grade | ESD (ø20 ~ 32 mm) | | | T/ESD (ø40 ~ 80 mm) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Cutting speed Vc (m/min) | Feed per tooth fz (mm/t) | | Cutting speed Vc (m/min) | Feed per tooth fz (mm/t) | |
| | | | | Shouldering, grooving, Z-feed milling | Partial plunging | | Shouldering, grooving, Z-feed milling | Partial plunging |
| P | Carbon steels C50, etc. < 300 HB | AH120 | 100 ~ 180 | 0.05 ~ 0.2 | 0.03 ~ 0.1 | 120 ~ 200 | 0.08 ~ 0.25 | 0.03 ~ 0.1 |
| | | AH330 | 120 ~ 230 | 0.05 ~ 0.15 | 0.03 ~ 0.08 | 150 ~ 250 | 0.05 ~ 0.2 | 0.03 ~ 0.08 |
| | | UX30 | 80 ~ 130 | 0.05 ~ 0.15 | 0.03 ~ 0.08 | 100 ~ 130 | 0.05 ~ 0.2 | 0.03 ~ 0.08 |
| | | T3130 | 100 ~ 180 | 0.05 ~ 0.2 | 0.03 ~ 0.1 | 120 ~ 200 | 0.08 ~ 0.25 | 0.03 ~ 0.1 |
| | Alloy steels 42CrMo4, etc. < 300 HB | AH120 | 80 ~ 160 | 0.05 ~ 0.15 | 0.03 ~ 0.08 | 100 ~ 180 | 0.08 ~ 0.2 | 0.03 ~ 0.08 |
| | | AH330 | 100 ~ 200 | 0.05 ~ 0.13 | 0.03 ~ 0.06 | 120 ~ 230 | 0.05 ~ 0.15 | 0.03 ~ 0.06 |
| | | UX30 | 80 ~ 120 | 0.05 ~ 0.13 | 0.03 ~ 0.06 | 100 ~ 120 | 0.05 ~ 0.15 | 0.03 ~ 0.06 |
| | | T3130 | 80 ~ 160 | 0.05 ~ 0.15 | 0.03 ~ 0.08 | 100 ~ 180 | 0.08 ~ 0.2 | 0.03 ~ 0.08 |
| | Die steels X96CrMoV12, etc. < 300 HB | AH120 | 60 ~ 120 | 0.05 ~ 0.13 | 0.03 ~ 0.06 | 80 ~ 150 | 0.08 ~ 0.15 | 0.03 ~ 0.06 |
| | | AH330 | 80 ~ 160 | 0.05 ~ 0.1 | 0.03 ~ 0.05 | 100 ~ 200 | 0.05 ~ 0.13 | 0.03 ~ 0.05 |
| | | UX30 | 60 ~ 100 | 0.05 ~ 0.1 | 0.03 ~ 0.05 | 80 ~ 120 | 0.05 ~ 0.13 | 0.03 ~ 0.05 |
| | | T3130 | 60 ~ 120 | 0.05 ~ 0.13 | 0.03 ~ 0.06 | 80 ~ 150 | 0.08 ~ 0.15 | 0.03 ~ 0.06 |
| M | Stainless steels X5CrNi18-9, etc. | AH140 | 80 ~ 160 | 0.05 ~ 0.15 | 0.03 ~ 0.08 | 100 ~ 180 | 0.08 ~ 0.2 | 0.03 ~ 0.08 |
| K | Cast irons 250, etc. | AH120 | 100 ~ 180 | 0.05 ~ 0.25 | 0.03 ~ 0.1 | 120 ~ 200 | 0.08 ~ 0.25 | 0.03 ~ 0.1 |
| | | AH330 | 120 ~ 230 | 0.05 ~ 0.2 | 0.03 ~ 0.08 | 150 ~ 250 | 0.05 ~ 0.2 | 0.03 ~ 0.08 |
| | | UX30 | 80 ~ 130 | 0.05 ~ 0.2 | 0.03 ~ 0.08 | 100 ~ 130 | 0.05 ~ 0.2 | 0.03 ~ 0.08 |
| N | Aluminium alloys | DS1100 | 200 ~ 1000 | 0.05 ~ 0.25 | 0.05 ~ 0.15 | 200 ~ 1000 | 0.05 ~ 0.25 | 0.05 ~ 0.15 |
| | Copper alloys | TH10 | 200 ~ 400 | 0.05 ~ 0.25 | 0.05 ~ 0.15 | 200 ~ 400 | 0.05 ~ 0.25 | 0.05 ~ 0.15 |

## APPLICATION RANGE

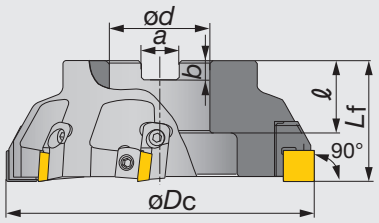



| Designation | Tool øDc (mm) | Max. depth of cut ap (mm) | Max. plunging depth A (mm) | Max. plunging width C (mm) | Max. ramping angle θ° | Min. machinable hole dia. øD1 (mm) | Max. machinable hole dia. øD2 (mm) | Max. cutting width in enlarging hole ae (mm) |
|---|---|---|---|---|---|---|---|---|
| ESD10020R... | 20 | 9 | 2.5 | 8 | 10 | 24 | 38 | 18 |
| ESD10025R... | 25 | 9 | 2.5 | 9 | 10 | 32 | 48 | 23 |
| ESD10032R... | 32 | 9 | 2.5 | 9 | 6.5 | 46 | 62 | 30 |
| ESD17040RS/L (A) | 40 | 15 | 4.5 | 15 | 10 | 50 | 77 | 38 |
| ESD17050RS/L (A) | 50 | 15 | 4.5 | 15 | 8 | 70 | 97 | 48 |
| ESD17063RS/L (A) | 63 | 15 | 4.5 | 15 | 5.5 | 96 | 123 | 61 |

Square shoulder mills with wedge clamped SPMR16 inserts in large depth of cut.

A.R.=+6°,R.R.=-8°

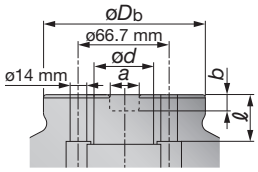




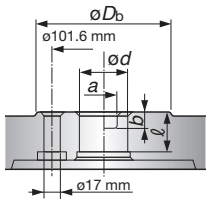

| Designation | Max. ap | øDc | z | Lf | ød | ℓ | a | b | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| TPP16080RI-E | 12 | 80 | 4 | 50 | 27 | 26 | 12.4 | 7 | 1 | SPMR1605... |
| TPP16100RI-E | 12 | 100 | 5 | 63 | 32 | 32 | 14.4 | 8 | 1.8 | SPMR1605... |
| TPP16125RI-E | 12 | 125 | 6 | 63 | 40 | 32 | 16.4 | 9 | 2.8 | SPMR1605... |
| TPP16160RI-E | 12 | 160 | 8 | 63 | 40 | 29 | 16.4 | 9 | 4.6 | SPMR1605... |
| TPP16200RI-E | 12 | 200 | 10 | 63 | 60 | 38 | 25.7 | 14 | 6.9 | SPMR1605... |
| TPP16250RI-E | 12 | 250 | 12 | 63 | 60 | 38 | 25.7 | 14 | 13 | SPMR1605... |
| TPP16315RI-E | 12 | 315 | 14 | 63 | 60 | 38 | 25.7 | 14 | 22.2 | SPMR1605... |

## Arbor type

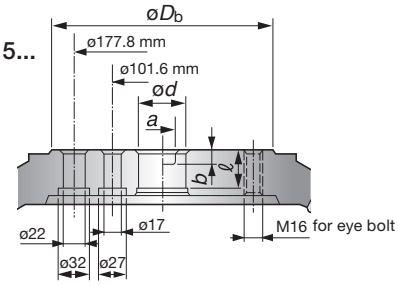
TPP16160...




TPP16200/250...



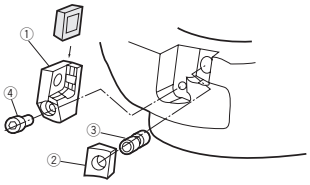

TPP16315...





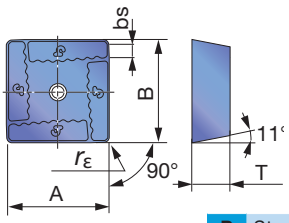

### SPARE PARTS

| Designation | ①Locator | ②Wedge | ③Right-left screw | ④Locator fixing screw | Wrench |
|---|---|---|---|---|---|
| TPP16080, 100RI-E | LPP16R | WPP16R | FDS-8SS | CM5X0.8X12 | TP-4 |
| TPP16125 - 315RI-E | LPP16R | WPP16R | FDS-8S | CM5X0.8X12 | TP-4 |

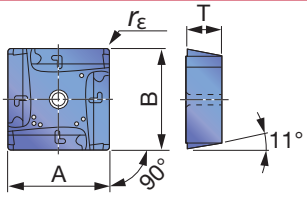



## INSERT

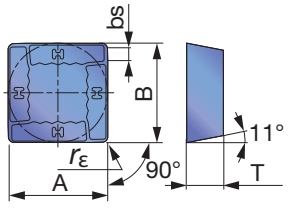
### SPMR16-MJ




### SPMR16-ML




### SPMR16-MH




| | | |

# STANDARD CUTTING CONDITIONS

## For MJ-chipbreaker inserts (General purpose)

| ISO | Workpiece material | Grade | Roughing (Depth of cut: *ap* > 1.5 mm) | | Finishing (Depth of cut: *ap* = 0.3 ~ 0.7 mm) | |
|---|---|---|---|---|---|---|
| | | | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) |
| P | Mild steels Unhardened steels < 180 HB | GH330 | 100 ~ 230 | 0.1 ~ 0.25 | 130 ~ 250 | 0.1 ~ 0.3 |
| | | T3130 | 130 ~ 300 | 0.1 ~ 0.28 | 180 ~ 300 | 0.1 ~ 0.3 |
| | | UX30 | 100 ~ 180 | 0.1 ~ 0.25 | 130 ~ 200 | 0.1 ~ 0.3 |
| | Carbon steels Alloy steels < 300 HB | GH330 | 100 ~ 180 | 0.1 ~ 0.2 | 130 ~ 200 | 0.1 ~ 0.28 |
| | | T3130 | 130 ~ 280 | 0.1 ~ 0.25 | 180 ~ 280 | 0.1 ~ 0.28 |
| | | UX30 | 80 ~ 130 | 0.1 ~ 0.2 | 100 ~ 150 | 0.1 ~ 0.28 |
| | Die steels < 30 HRC | GH330 | 100 ~ 150 | 0.1 ~ 0.18 | 100 ~ 150 | 0.1 ~ 0.2 |
| | | UX30 | 80 ~ 130 | 0.1 ~ 0.18 | 80 ~ 130 | 0.1 ~ 0.2 |
| M | Stainless steels < 250 HB | GH330 | 150 ~ 200 | 0.15 ~ 0.23 | 200 ~ 250 | 0.15 ~ 0.25 |
| K | Cast irons Ductile cast irons | T1115 | 100 ~ 200 | 0.1 ~ 0.2 | 100 ~ 200 | 0.1 ~ 0.25 |
| | | UX30 | 80 ~ 130 | 0.1 ~ 0.2 | 80 ~ 130 | 0.1 ~ 0.25 |

## For ML-chipbreaker inserts (Sharpness-priority)

| ISO | Workpiece material | Grade | Roughing (Depth of cut: *ap* > 1.5 mm) | | Finishing (Depth of cut: *ap* = 0.3 ~ 0.7 mm) | |
|---|---|---|---|---|---|---|
| | | | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) |
| P | Mild steels Unhardened steels < 180 HB | GH330 | 130 ~ 230 | 0.05 ~ 0.17 | 150 ~ 250 | 0.05 ~ 0.2 |
| | | AH330 | 130 ~ 370 | 0.05 ~ 0.17 | 150 ~ 400 | 0.05 ~ 0.2 |
| | Carbon steels Alloy steels < 300 HB | GH330 | 150 ~ 180 | 0.05 ~ 0.12 | 150 ~ 200 | 0.05 ~ 0.15 |
| M | Stainless steels < 250 HB | GH330 | 150 ~ 200 | 0.05 ~ 0.12 | 200 ~ 250 | 0.05 ~ 0.15 |

## For MH-chipbreaker inserts (Toughness-priority)

| ISO | Workpiece material | Grade | Roughing (Depth of cut: *ap* > 1.5 mm) | | Finishing (Depth of cut: *ap* = 0.3 ~ 0.7 mm) | |
|---|---|---|---|---|---|---|
| | | | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) |
| P | Mild steels Unhardened steels < 180 HB | GH330 | 100 ~ 230 | 0.15 ~ 0.3 | 130 ~ 250 | 0.15 ~ 0.35 |
| | | T3130 | 130 ~ 300 | 0.15 ~ 0.33 | 180 ~ 300 | 0.15 ~ 0.38 |
| | | UX30 | 100 ~ 180 | 0.15 ~ 0.3 | 130 ~ 200 | 0.15 ~ 0.35 |
| | Carbon steels Alloy steels < 300 HB | GH330 | 100 ~ 180 | 0.15 ~ 0.24 | 130 ~ 200 | 0.15 ~ 0.35 |
| | | T3130 | 130 ~ 280 | 0.15 ~ 0.3 | 180 ~ 280 | 0.15 ~ 0.35 |
| | | UX30 | 80 ~ 130 | 0.15 ~ 0.24 | 100 ~ 150 | 0.15 ~ 0.35 |
| | Die steels < 30 HRC | GH330 | 100 ~ 150 | 0.15 ~ 0.22 | 100 ~ 150 | 0.15 ~ 0.28 |
| | | UX30 | 80 ~ 130 | 0.15 ~ 0.22 | 80 ~ 130 | 0.15 ~ 0.28 |
| K | Cast irons Ductile cast irons | T1115 | 100 ~ 200 | 0.15 ~ 0.24 | 100 ~ 200 | 0.15 ~ 0.3 |
| | | UX30 | 80 ~ 130 | 0.15 ~ 0.24 | 80 ~ 130 | 0.15 ~ 0.3 |

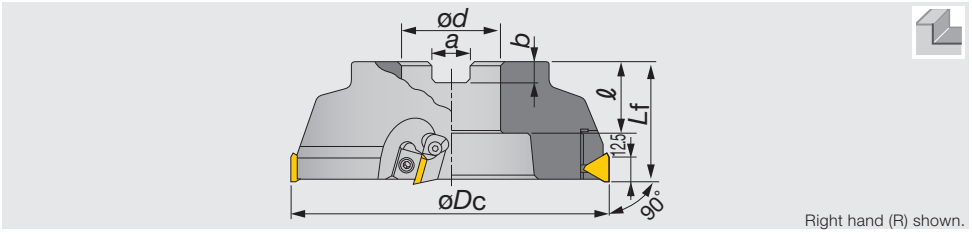
Notes:
- As a rule, dry cutting (or air-blowing) is generally recommended.
- If a cutting fluid is used, the cutting speed should be set to the lower side of the values shown in the above table.
- When being used in square shoulder milling, climb milling is recommended.
- In square shoulder milling of stainless steel, when chips tend to be recut during cutting, change to up-milling mode.
- When wet machining mild steels, carbon steels and alloy steels, use T3130 at lower cutting conditions.

## TSE3000R

### Shoulder square mills with wedge clamped high-posi triangle inserts

A.R.= +17°, R.R.= +5°






Right hand (R) shown.

| Designation | Max. ap | øDc | z | Lf | ød | ℓ | a | b | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| TSE3050R-E | 8 | 50 | 3 | 40 | 22 | 20 | 10.4 | 6.3 | 0.3 | TE*N32/TEKR1603... |
| TSE3063R-E | 8 | 63 | 3 | 40 | 22 | 20 | 10.4 | 6.3 | 0.5 | TE*N32/TEKR1603... |
| TSE3003RIA-E | 8 | 80 | 4 | 50 | 27 | 26 | 12.4 | 7 | 1 | TE*N32/TEKR1603... |
| TSE3004RIA-E | 8 | 100 | 6 | 63 | 32 | 32 | 14.4 | 8 | 2 | TE*N32/TEKR1603... |

Note: TSE3050R-E and TSE3063R-E are not irregular pitch spec.

**SPARE PARTS**

| Designation | ①Clamp set | ②Locator | ③Screw | ④Wedge | ⑤Right-left screw | Wrench | Wrench 1 |
|---|---|---|---|---|---|---|---|
| TSE3050R..., 63R... | CSL-4 | - | - | - | - | - | P-3 |
| TSE300*RIA-E | - | LE303R | CM4X0.7X12 | WF330R | FDS-8S | TP-4 | - |

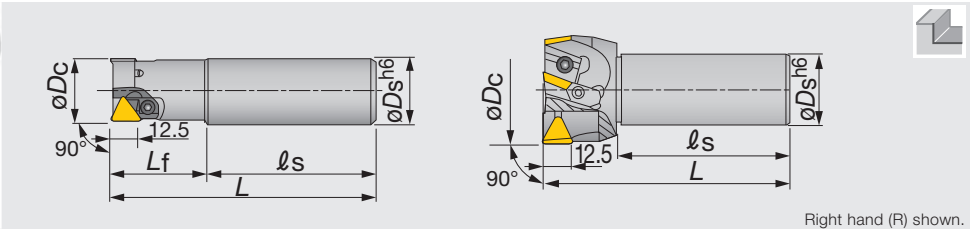


## ESE3000R

### Shoulder square endmills with wedge clamped high-posi triangle inserts

A.R.= +17°, R.R.= +5°






Right hand (R) shown.

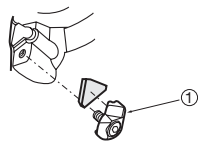
| Designation | Max.ap | øDc | z | øDs | ℓs | Lf | L | Insert |
|---|---|---|---|---|---|---|---|---|
| ESE3020R | 8 | 20 | 1 | 20 | 70 | 30 | 100 | TE*N32/TEKR1603... |
| ESE3025R | 8 | 25 | 1 | 25 | 80 | 35 | 115 | TE*N32/TEKR1603... |
| ESE3030R | 8 | 30 | 2 | 32 | 80 | 45 | 125 | TE*N32/TEKR1603... |
| ESE3035R | 8 | 35 | 2 | 32 | 80 | 45 | 125 | TE*N32/TEKR1603... |
| ESE3040R | 8 | 40 | 2 | 32 | 80 | 45 | 125 | TE*N32/TEKR1603... |
| ESE3050R | 8 | 50 | 3 | 32 | 80 | - | 115 | TE*N32/TEKR1603... |
| ESE3063R | 8 | 63 | 4 | 32 | 80 | - | 115 | TE*N32/TEKR1603... |

Note: The TAC Endmills shown above are not irregular pitch spec.

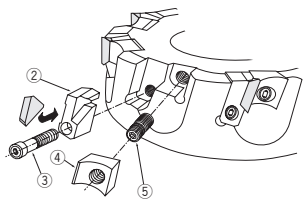
**SPARE PARTS**

| Designation | Clamp set | Locator | Right-left screw | Shell locking bolt | Wedge | Wrench | Wrench 1 |
|---|---|---|---|---|---|---|---|
| ESE3020 - 50R | CSL-4 | - | - | - | - | - | P-3 |
| ESE3063R | - | LE302R | DS-8S | SHCM4-10 | WP302R | TP-4 | - |

TSE3050R ~ 3063R-E
ESE3020R ~ 3040R

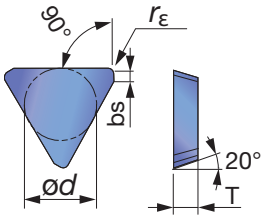



TSE3003RIA-E, 3004RIA-E
ESE3050R ~ 3063R

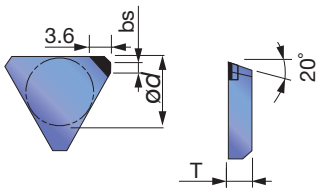


## INSERT

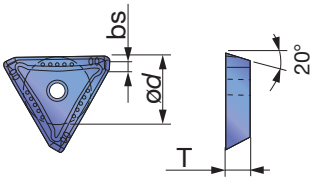
### TECN/TEEN 32Z




### TECN32ZFR-DIA




### TEKR16-MS




| | | AH120 | AH130 | AH140 | AH330 | GH330 | T1115 | T3130 | NS740 | N308 | UX30 | TH10 | DX140 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ★ | | | ☆ | ☆ | | ★ | ★ | ★ | ☆ | | |
| M | Stainless | | ★ | ★ | | | | | | | | | |
| K | Cast iron | ★ | | | | | ★ | | | | | | |
| N | Non-ferrous | | | | | | | | | | | ★ | ★ |
| S | Superalloys | ★ | ☆ | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | |

★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | Coating | | | | | | | Cermet | | Uncoated | | PCD | ød | T | bs |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | AH120 | AH130 | AH140 | AH330 | GH330 | T1115 | T3130 | NS740 | N308 | UX30 | TH10 | DX140 | | | |
| TECN32ZFR | - | 8 | | | | | | | | | | | ● | | 9.525 | 3.18 | 1.37 |
| TECN32ZTR | 0.8 | 8 | | | | | | | | ● | ● | ● | | | 9.525 | 3.18 | 1 |
| TEEN32ZFR | - | 8 | | | | | | | | | | | ● | | 9.525 | 3.18 | 1.37 |
| TEEN32ZTR | 0.8 | 8 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | 9.525 | 3.18 | 1 |
| TECN32ZFR-DIA | - | 2.5 | | | | | | | | | | | | ● | 9.525 | 3.18 | 1.37 |
| TEKR1603PEPR-MS | - | 8 | | | ● | | | | | | | | | | 9.525 | 3.18 | 1.49 |

Note: T-DIA is trade name for Tungaloy's PCD grade. Available in one-corner type.

●: Line-up
DX140 : Packing Quantity = 1 pc.

# STANDARD CUTTING CONDITIONS

## Applied to cutter dia. ≤ ø40 mm

| ISO | Workpiece material | Grade | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) |
|---|---|---|---|---|
| P | Mild steels<br>Unhardened steels<br>< 180 HB | T3130 | 60 ~ 180 | 0.05 ~ 0.2 |
| | | NS740 · N308 | 60 ~ 150 | 0.05 ~ 0.15 |
| | | AH130 · GH330 · UX30 | 60 ~ 130 | 0.05 ~ 0.2 |
| | Carbon steels<br>Alloy steels<br>< 300 HB | T3130 | 60 ~ 150 | 0.05 ~ 0.18 |
| | | UX30 · AH120 | 60 ~ 130 | 0.05 ~ 0.18 |
| | | NS740 · N308 | 60 ~ 130 | 0.05 ~ 0.15 |
| | Die steels<br>< 30 HRC | T3130 · UX30 · AH120 | 80 ~ 130 | 0.05 ~ 0.2 |
| | | NS740 · N308 | 60 ~ 130 | 0.05 ~ 0.15 |
| M | Stainless steels<br>< 250 HB | AH130 · AH140 | 100 ~ 180 | 0.08 ~ 0.2 |
| | | AH120 · GH330 | 100 ~ 200 | 0.08 ~ 0.2 |
| | | TU40 | 80 ~ 130 | 0.08 ~ 0.2 |
| K | Cast irons | T1115 | 100 ~ 150 | 0.05 ~ 0.2 |
| N | Aluminium alloys | TH10 | 200 ~ 400 | 0.05 ~ 0.2 |

## Applied to cutter dia. ≥ ø50 mm

| ISO | Workpiece material | Grade | Roughing (Depth of cut: > 1.5 mm) | | Finishing (Depth of cut: 0.3 ~ 0.7 mm) | |
|---|---|---|---|---|---|---|
| | | | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) |
| P | Mild steels<br>Unhardened steels<br>< 180 HB | AH120 · GH330 | 130 ~ 230 | 0.1 ~ 0.2 | 130 ~ 250 | 0.1 ~ 0.23 |
| | | T3130 | 130 ~ 300 | 0.1 ~ 0.23 | 150 ~ 300 | 0.1 ~ 0.25 |
| | | NS740 · N308 | 130 ~ 200 | 0.1 ~ 0.18 | 150 ~ 250 | 0.1 ~ 0.2 |
| | | UX30 · AH130 | 100 ~ 180 | 0.1 ~ 0.2 | 130 ~ 200 | 0.1 ~ 0.23 |
| | Carbon steels<br>Alloy steels<br>< 300 HB | AH120 · GH330 | 100 ~ 200 | 0.1 ~ 0.18 | 130 ~ 230 | 0.1 ~ 0.2 |
| | | T3130 | 130 ~ 280 | 0.1 ~ 0.2 | 180 ~ 280 | 0.1 ~ 0.23 |
| | | NS740 · N308 | 100 ~ 150 | 0.1 ~ 0.15 | 150 ~ 200 | 0.1 ~ 0.18 |
| | | UX30 | 80 ~ 130 | 0.1 ~ 0.18 | 100 ~ 150 | 0.1 ~ 0.2 |
| | Die steels<br>< 30 HRC | T3130 · AH120 | 100 ~ 150 | 0.1 ~ 0.15 | 100 ~ 150 | 0.1 ~ 0.2 |
| | | UX30 | 80 ~ 130 | 0.1 ~ 0.15 | 80 ~ 130 | 0.1 ~ 0.2 |
| M | Stainless steels<br>< 250 HB | AH130 · AH140 | 80 ~ 180 | 0.1 ~ 0.2 | 100 ~ 200 | 0.1 ~ 0.25 |
| | | AH120 · GH330 | 150 ~ 200 | 0.1 ~ 0.18 | 200 ~ 250 | 0.1 ~ 0.25 |
| K | Cast irons | T1115 | 100 ~ 200 | 0.1 ~ 0.2 | 100 ~ 200 | 0.1 ~ 0.2 |
| | | TH10 | 80 ~ 130 | 0.1 ~ 0.2 | 80 ~ 130 | 0.1 ~ 0.25 |
| N | Aluminium alloys<br>Si < 13% | TH10 | 200 ~ 1000 | 0.05 ~ 0.25 | 350 ~ 1000 | 0.1 ~ 0.25 |
| | | DX140 | 200 ~ 1000 | 0.05 ~ 0.15 | 350 ~ 1000 | 0.1 ~ 0.2 |
| | Copper alloys | TH10 | 200 ~ 500 | 0.1 ~ 0.15 | 200 ~ 500 | 0.1 ~ 0.2 |

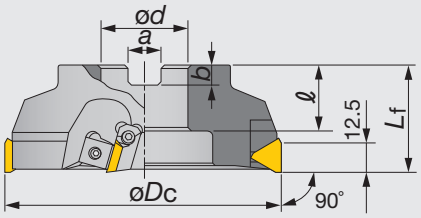
Note:
- Dry cutting is recommended except for aluminium alloys
- Maximum depth of cut for TECN32ZFR-DIA is 2.5 mm.
- When wet machining mild steels, carbon steels and alloy steels, use T3130 at lower cutting conditions.

## TSE4000RIA

Shoulder square mills with wedge clamped high-posi triangle inserts

A.R. = +17°, R.R. = +5°



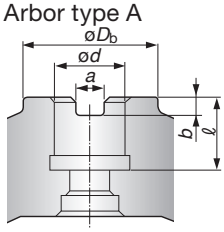



Right hand (R) shown.

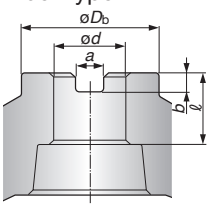
| Designation | Max. ap | øDc | z | Lf | ød | ℓ | a | b | Kg | Arbor type |
|---|---|---|---|---|---|---|---|---|---|---|
| TSE4003RIAE | 10 | 80 | 4 | 50 | 27 | 26 | 12.4 | 70 | 1 | A |
| TSE4004RIAE | 10 | 100 | 6 | 63 | 32 | 32 | 14.4 | 80 | 1.9 | A |
| TSE4005RIAE | 10 | 125 | 6 | 63 | 40 | 32 | 16.4 | 90 | 2.9 | B |
| TSE4006RIAE | 10 | 160 | 8 | 63 | 40 | 29 | 16.4 | 90 | 4.9 | B |

## Arbor type

Arbor type A

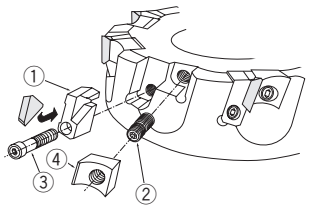



Arbor type B




SPARE PARTS

| Designation | ①Locator | ②Right-left screw | ③Locator fixing screw | Shell locking bolt | ④Wedge | Wrench |
|---|---|---|---|---|---|---|
| TSE4003RIAE | LE403R | FDS-8S | CM4X0.7X14 | - | WF330N | TP-4 |
| TSE4004RIAE | LE403R | FDS-8S | CM4X0.7X14 | - | WF330N | TP-4 |
| TSE4005RIAE | LE405R | FDS-8S | CM4X0.7X14 | - | WF500R | TP-4 |
| TSE4006RIAE | LE405R | FDS-8S | CM4X0.7X14 | - | WF500R | TP-4 |

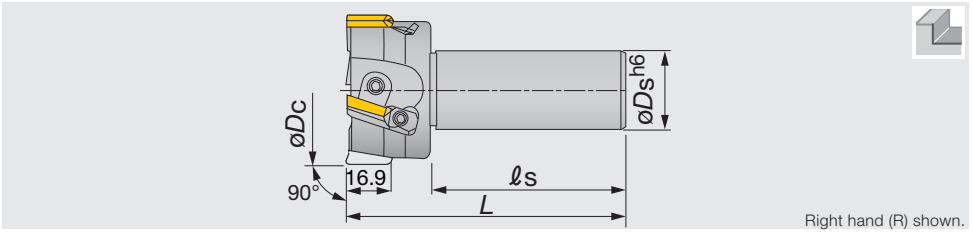


## ESE4000R

Shoulder square endmills with wedge clamped high-posi triangle inserts

A.R. = +17°, R.R. = +1° ~ +4°






Right hand (R) shown.

| Designation | Max. *ap* | ø*Dc* | z | ø*Ds* | *ℓs* | *L* | Insert |
|---|---|---|---|---|---|---|---|
| ESE4050RA | 10 | 50 | 3 | 32 | 80 | 115 | TE*N43/TEKR2204... |
| ESE4063RA | 10 | 63 | 4 | 32 | 80 | 115 | TE*N43/TEKR2204... |
| ESE4003RIA-S32 | 10 | 80 | 4 | 32 | 80 | 120 | TE*N43/TEKR2204... |

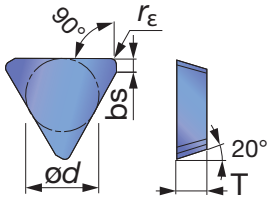
Note: TSE4050RA and TSE4063RA are not irregular pitch spec.

### SPARE PARTS

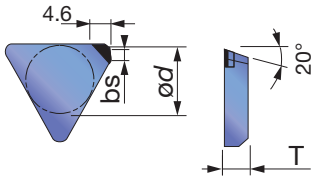
| Designation | Locator | Right-left screw | Locator fixing screw | Shell locking bolt | Wedge | Wrench |
|---|---|---|---|---|---|---|
| ESE4050RA | LE402AR | DS-8S | - | SHCM4-10 | WT402R | TP-4 |
| ESE4063RA | LE402AR | DS-8 | - | SHCM4-10 | WT402R | TP-4 |
| ESE4003RIA-S32 | LE403R | FDS-8S | CM4X0.7X14 | - | WF330N | TP-4 |

## INSERT

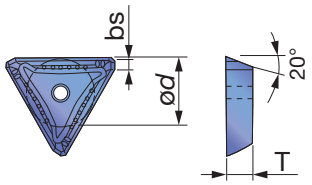
### TECN/TEEN 43Z




### TECN43ZFR-DIA




### TEKR22-MS




| | | Coating | | | | | | | Cermet | | Uncoated | | PCD | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH130 | AH140 | AH330 | GH330 | T1115 | T3130 | NS740 | N308 | UX30 | TH10 | DX140 | | |
| P | Steel | ★ | | | ☆ | ☆ | | ★ | ★ | ★ | | ☆ | | | |
| M | Stainless | | ★ | ★ | | | | | | | | | | | |
| K | Cast iron | ★ | | | | | ★ | | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | ★ | ★ | | |
| S | Superalloys | ★ | ☆ | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | |

★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | Coating | | | | | | | Cermet | | Uncoated | | PCD | | ød | T | bs |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | AH120 | AH130 | AH140 | AH330 | GH330 | T1115 | T3130 | NS740 | N308 | UX30 | TH10 | DX140 | | | | |
| TECN43ZFR | 1 | 10 | | | | | | | | | | | ● | | | 12.7 | 4.76 | 2 |
| TECN43ZTR | 1 | 10 | | | | | | | | ● | ● | ● | | | | 12.7 | 4.76 | 1.31 |
| TEEN43ZFR | 1 | 10 | | | | | | | | | | | ● | | | 12.7 | 4.76 | 2 |
| TEEN43ZTR | 1 | 10 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | 12.7 | 4.76 | 1.31 |
| TECN43ZFR-DIA | - | 3.5 | | | | | | | | | | | | ● | | 12.7 | 4.76 | 2 |
| TEKR2204PEPR-MS | - | 10 | | | ● | | | | | | | | | | | 12.7 | 4.76 | 1.8 |

Note: T-DIA is trade name for Tungaloy's PCD grade. Available in one-corner type

●: Line-up
DX140 : Packing Quantity = 1 pc.

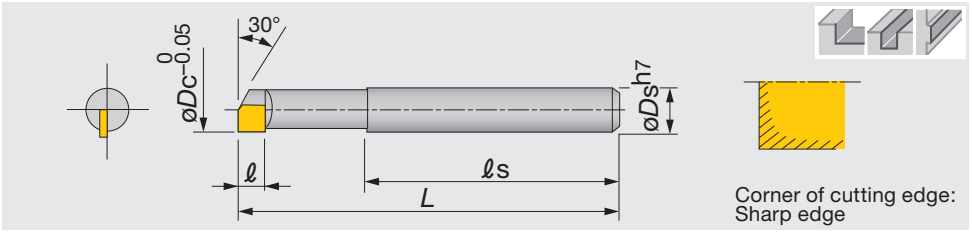
## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Grade | Roughing (Depth of cut *ap*: > 1.5 mm) | | Finishing (Depth of cut *ap*: 0.3 ~ 0.7 mm) | |
|---|---|---|---|---|---|---|
| | | | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) |
| P | Mild steels Unhardened steels < 180 HB | AH330 | 130 ~ 370 | 0.1 ~ 0.2 | 150 ~ 400 | 0.1 ~ 0.23 |
| | | AH120 · GH330 | 130 ~ 230 | 0.1 ~ 0.2 | 150 ~ 250 | 0.1 ~ 0.23 |
| | | T3130 | 130 ~ 300 | 0.1 ~ 0.23 | 180 ~ 300 | 0.1 ~ 0.25 |
| | | NS740 · N308 | 130 ~ 200 | 0.1 ~ 0.18 | 150 ~ 250 | 0.1 ~ 0.2 |
| | | UX30 · AH140 | 100 ~ 180 | 0.1 ~ 0.2 | 130 ~ 200 | 0.1 ~ 0.23 |
| | Carbon steels Alloy steels < 300 HB | AH330 | 100 ~ 300 | 0.1 ~ 0.18 | 150 ~ 320 | 0.1 ~ 0.2 |
| | | AH120 · GH330 | 100 ~ 180 | 0.1 ~ 0.18 | 150 ~ 200 | 0.1 ~ 0.2 |
| | | T3130 | 130 ~ 280 | 0.1 ~ 0.2 | 180 ~ 280 | 0.1 ~ 0.23 |
| | | AH140 | 80 ~ 130 | 0.1 ~ 0.18 | 100 ~ 200 | 0.1 ~ 0.18 |
| | | NS740 · N308 | 100 ~ 150 | 0.1 ~ 0.15 | 150 ~ 200 | 0.1 ~ 0.18 |
| | | UX30 | 80 ~ 130 | 0.1 ~ 0.18 | 100 ~ 150 | 0.1 ~ 0.2 |
| | Die steels < 30 HRC | AH330 | 100 ~ 250 | 0.1 ~ 0.15 | 100 ~ 250 | 0.1 ~ 0.2 |
| | | T3130 · AH120 · GH330 | 100 ~ 150 | 0.1 ~ 0.15 | 100 ~ 150 | 0.1 ~ 0.2 |
| | | UX30 | 80 ~ 130 | 0.1 ~ 0.15 | 80 ~ 130 | 0.1 ~ 0.2 |
| M | Stainless steels < 250 HB | AH130 · AH140 | 80 ~ 180 | 0.1 ~ 0.2 | 100 ~ 200 | 0.1 ~ 0.25 |
| | | AH120 | 150 ~ 200 | 0.1 ~ 0.18 | 200 ~ 250 | 0.1 ~ 0.25 |
| K | Cast irons Ductile cast irons | T1115 | 100 ~ 200 | 0.1 ~ 0.2 | 100 ~ 200 | 0.1 ~ 0.25 |
| | | TH10 | 80 ~ 130 | 0.1 ~ 0.2 | 80 ~ 130 | 0.1 ~ 0.25 |
| N | Aluminium alloys Si < 13% | TH10 | 200 ~ 1000 | 0.05 ~ 0.25 | 350 ~ 1000 | 0.1 ~ 0.25 |
| | | DX140 | 200 ~ 1000 | 0.05 ~ 0.15 | 350 ~ 1000 | 0.1 ~ 0.2 |
| | Copper alloys | TH10 | 200 ~ 500 | 0.1 ~ 0.15 | 200 ~ 500 | 0.1 ~ 0.2 |

Note:
- Dry cutting is recommended for all materials except for aluminium alloys.
- Maximum depth of cut for TECN43ZFR-DIA is 3.5 mm.
- When wet machining mild steels, carbon steels and alloy steels, use T3130 at lower cutting conditions.

- No. of revolutions ($min^{-1}$) = Cutting speed × 1000 ÷ 3.14 ÷ Cutter diameter
- Table feed (mm/min) = No. of revolutions × Feed per tooth × No. of inserts






| Designation | DX140 | Z | øDc | øDs | ℓ | ℓs | L |
|---|---|---|---|---|---|---|---|
| DEB1040 | ● | 1 | 4 | 6 | 3.5 | 32 | 45 |
| DEB1050 | ● | 1 | 5 | 6 | 3.5 | 35 | 50 |
| DEB1060 | ● | 1 | 6 | 6 | 3.5 | 35 | 50 |
| DEB1080 | ● | 1 | 8 | 8 | 5 | 37 | 55 |
| DEB1100 | ● | 1 | 10 | 10 | 5 | 40 | 60 |
| DEB1120 | ● | 1 | 12 | 12 | 5 | 45 | 65 |

Notes:
●: Line-up
• As cutting edge is very sharp, please handle carefully.
• Please keep the overhang length from milling chuck of tool as short as possible.



## STANDARD CUTTING CONDITIONS

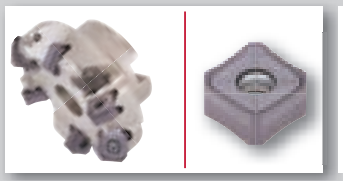
**DEB1000**

For side milling $a_p \leq 3D$, $a_e = 0.1$ mm

| ISO | Workpiece material | Mill dia. (mm) | Cutting Speed *Vc* (m/min) | No. of revolutions *n* (min$^{-1}$) | Table feed *Vf* (mm/min) |
|---|---|---|---|---|---|
| N | Aluminium alloys, Copper alloys | ø4 | 120 - 180 | 12,000 | 120 |
| | | ø5 | 120 - 180 | 9,600 | 120 |
| | | ø6 | 120 - 180 | 8,000 | 120 |
| | | ø8 | 120 - 180 | 6,000 | 120 |
| | | ø10 | 120 - 180 | 4,800 | 120 |
| | | ø12 | 120 - 180 | 4,000 | 100 |

- Set the protrusion length as short as possible. Reduce number of revolutions and table feed in order to prevent chattering when the protrusion length is long.
- Use the machine with high rigidity.
- Adjust the number of revolutions and the table feed according to the situation of use. (depth of cut or machine rigidity etc.)

MEMO

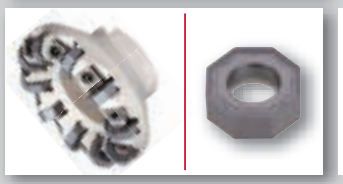


## DO TRIPLE MILL — D120

Face milling cutters with double-sided square, octagonal, and round inserts

45° ø50 - ø160 mm
max. ap 6 mm

P M K S H



## DOOCTO / DOQUAD — D123

Face milling cutters with screw-on and wedge clamping systems featuring 4 options of the inserts for a broader application range

45° ø63 - ø315 mm
max. ap 7.5 mm

P M K S H



## DOPENT — D129

Economical, double-sided inserts with 10 cutting edges for general-purpose milling

70° ø32 - ø160 mm
max. ap 6.4 mm

P M K N S

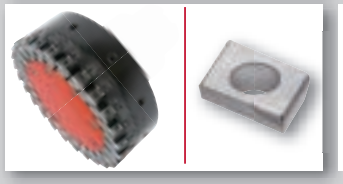


## TUNGMILL — D133

Single-sided inserts with low cutting force for face milling

45° ø25 - ø160 mm
max. ap 5 mm

P M K N



## TUNGSPEED MILL — D138

Incredibly productive high-speed machining with PCD inserts

90° ø25 - ø125 mm
max. ap 11 mm

N

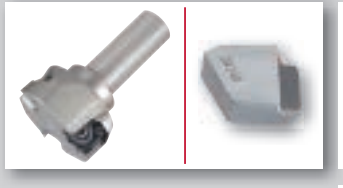


## EFE — D140

Lightweight cutters with screw clamping system suitable for low-rigid machines

85° ø50 mm
max. ap 8 mm

P M K N



## EDPD — D143

Lightweight cutters in wedge clamping design with PCD inserts

90° ø63 mm
max. ap 8 mm

N

## ISO Milling — D146

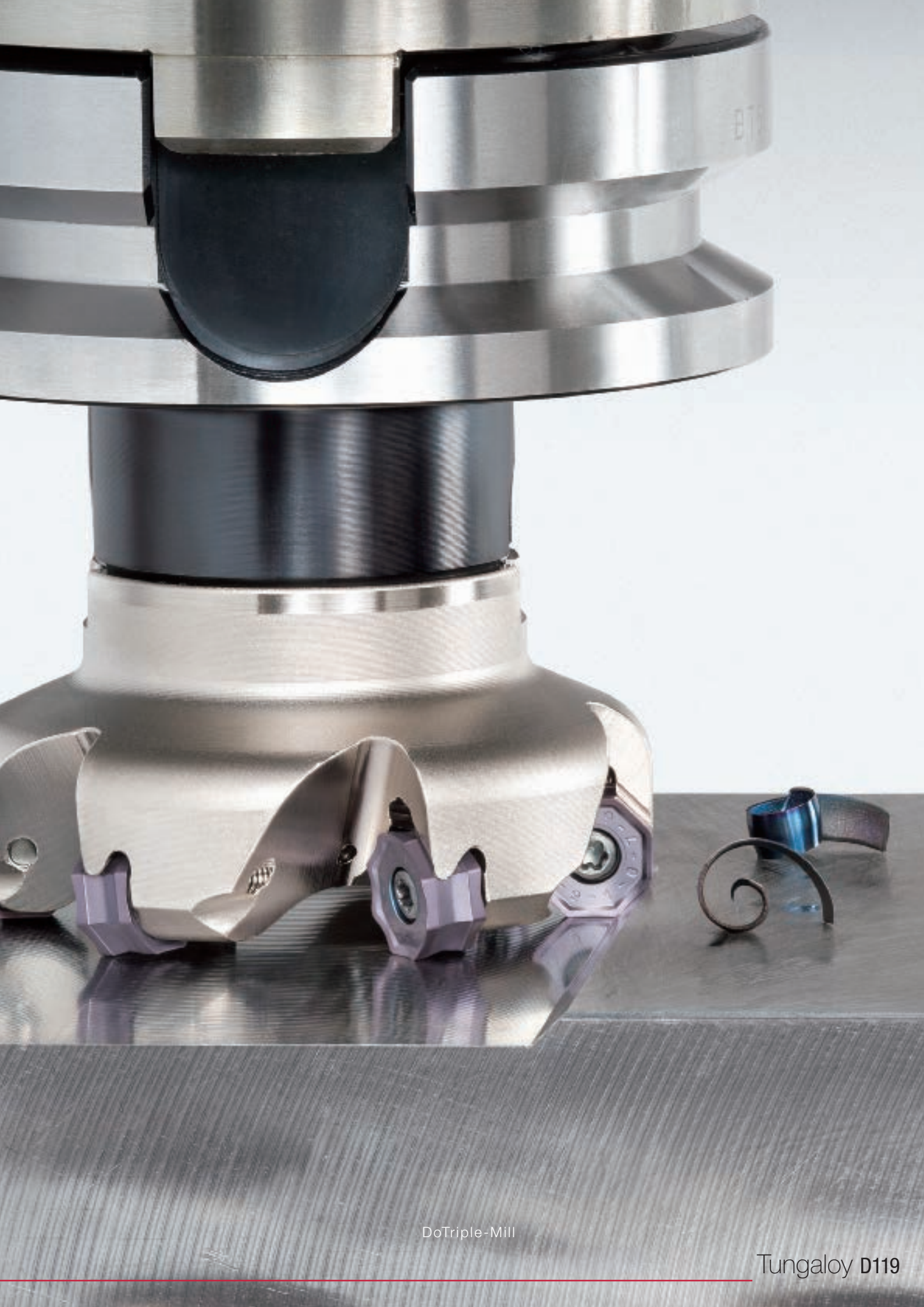
45° - T/EME4400, EMD4400, TMD5400, EGD
75° - TGP4100, TGN4200-A
Clamping systems - S-TAQ, QC

## Milling Tools with Round Inserts — D165

ERD6000, T/ERF6000

## Milling Tools for Finishing — D169

EMS, S/EFP4000



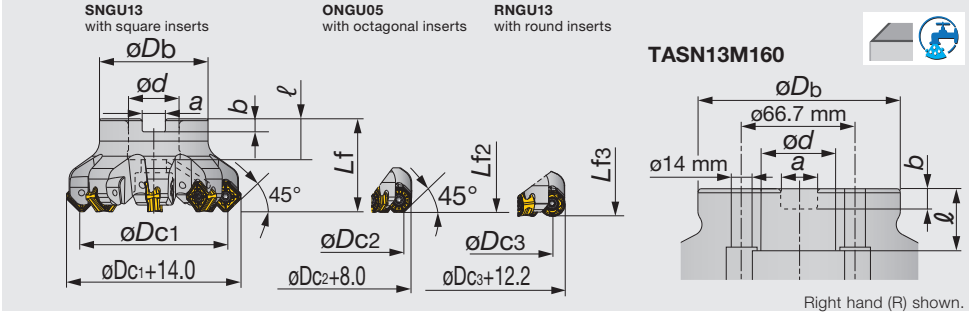
DoTriple-Mill

# TASN13

45° face milling cutter to seat double sided square, octagonal, round insert

A.R.=+6.0°,R.R.=-6.8°~-6.3°






Right hand (R) shown.

| Designation | øDc1 | øDc2 | øDc3 | z | øDb | Lf1 | Lf2 | Lf3 | ød | ℓ | a | b | Kg | Air hole |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TASN13M050B22.0R04 | 50 | 53 | 48.7 | 4 | 41 | 40 | 38.5 | 38.5 | 22 | 20 | 10.4 | 6.3 | 0.4 | with |
| TASN13M050B22.0R05 | 50 | 53 | 48.7 | 5 | 41 | 40 | 38.5 | 38.5 | 22 | 20 | 10.4 | 6.3 | 0.4 | with |
| TASN13M063B22.0R05 | 63 | 66 | 61.7 | 5 | 47 | 40 | 38.5 | 38.5 | 22 | 20 | 10.4 | 6.3 | 0.7 | with |
| TASN13M063B22.0R06 | 63 | 66 | 61.7 | 6 | 47 | 40 | 38.5 | 38.5 | 22 | 20 | 10.4 | 6.3 | 0.6 | with |
| TASN13M063B22.0R08 | 63 | 66 | 61.7 | 8 | 47 | 40 | 38.5 | 38.5 | 22 | 20 | 10.4 | 6.3 | 0.6 | with |
| TASN13M080B27.0R05 | 80 | 83 | 78.7 | 5 | 58 | 50 | 48.5 | 48.5 | 27 | 22 | 12.4 | 7 | 1.1 | with |
| TASN13M080B27.0R08 | 80 | 83 | 78.7 | 8 | 58 | 50 | 48.5 | 48.5 | 27 | 22 | 12.4 | 7 | 1.1 | with |
| TASN13M080B27.0R10 | 80 | 83 | 78.7 | 10 | 58 | 50 | 48.5 | 48.5 | 27 | 22 | 12.4 | 7 | 1.2 | with |
| TASN13M100B32.0R06 | 100 | 103 | 98.7 | 6 | 60 | 50 | 48.5 | 48.5 | 32 | 28.5 | 14.4 | 8 | 1.4 | with |
| TASN13M100B32.0R08 | 100 | 103 | 98.7 | 8 | 60 | 50 | 48.5 | 48.5 | 32 | 28.5 | 14.4 | 8 | 1.4 | with |
| TASN13M100B32.0R12 | 100 | 103 | 98.7 | 12 | 60 | 50 | 48.5 | 48.5 | 32 | 28.5 | 14.4 | 8 | 1.4 | with |
| TASN13M125B40.0R07 | 125 | 128 | 123.7 | 7 | 71 | 63 | 61.5 | 61.5 | 40 | 32 | 16.4 | 9 | 2.2 | with |
| TASN13M125B40.0R10 | 125 | 128 | 123.7 | 10 | 71 | 63 | 61.5 | 61.5 | 40 | 32 | 16.4 | 9 | 2.3 | with |
| TASN13M125B40.0R14 | 125 | 128 | 123.7 | 14 | 71 | 63 | 61.5 | 61.5 | 40 | 32 | 16.4 | 9 | 2.5 | with |
| TASN13M160B40.0R08 | 160 | 163 | 158.7 | 8 | 100 | 63 | 61.5 | 61.5 | 40 | 29 | 16.4 | 9 | 4.1 | without |
| TASN13M160B40.0R12 | 160 | 163 | 158.7 | 12 | 100 | 63 | 61.5 | 61.5 | 40 | 29 | 16.4 | 9 | 4.2 | without |

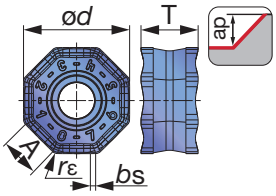
## SPARE PARTS

| Designation | Clamping screw | Grip | Lubricant | Shell locking bolt | Shell locking bolt 1 | Torx bit |
|---|---|---|---|---|---|---|
| TASN13M0**B22.0R... | CSPB-4 | H-TB2W | M-1000 | - | CM10X30H | BLDIP15/S7 |
| TASN13M080B27.0R... | CSPB-4 | H-TB2W | M-1000 | - | CM12X30H | BLDIP15/S7 |
| TASN13M100B32.0R... | CSPB-4 | H-TB2W | M-1000 | TMBA-M16H | - | BLDIP15/S7 |
| TASN13M125B40.0R... | CSPB-4 | H-TB2W | M-1000 | TMBA-M20H | - | BLDIP15/S7 |
| TASN13M160B40.0R... | CSPB-4 | H-TB2W | M-1000 | - | - | BLDIP15/M7 |

## INSERT

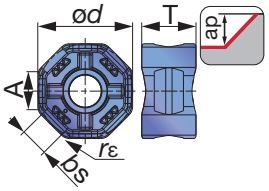
### ONGU-MJ





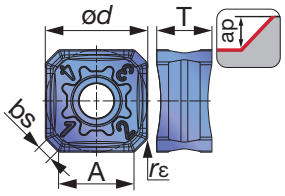

### ONGU-W





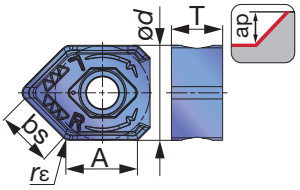

### SNGU-MJ





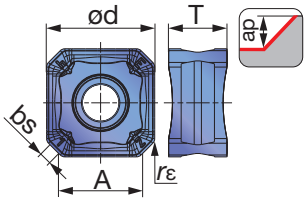

### SNGU-W





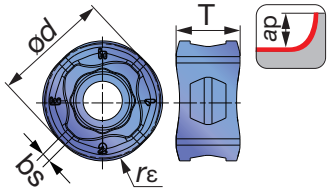

### SNGU-MH






### RNGU-MJ






| | | | | |
|---|---|---|---|---|
| P | Steel | ☆ | ★ | ★ |
| M | Stainless | | ★ | ★ |
| K | Cast iron | ★ | | |
| N | Non-ferrous | | | |
| S | Superalloys | ★ | ☆ | |
| H | Hard materials | | | |

★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | Coating | | | A | ød | T | bs |
|---|---|---|---|---|---|---|---|---|---|
| | | | AH120 | AH3135 | T3225 | | | | |
| ONGU0507ANEN-MJ | 0.8 | 3.4 | ● | ● | ● | 4.9 | 13 | 7 | 0.7 |
| ONGU0507ANEN-W | 1.6 | 3.4 | ● | ● | | 5 | 13 | 7.44 | 3.9 |
| SNGU1307ANEN-MJ | 0.5 | 6 | ● | ● | ● | 9.4 | 13 | 7 | 2 |
| SNGU1307ANEN-W | 1.2 | 6 | ● | ● | | 9.6 | 13 | 7 | 7.5 |
| SNGU1307ANEN-MH | 0.8 | 6 | | | ● | 9 | 13 | 7 | 2 |
| RNGU1307ZNER-MJ | 6 | 6 | ● | ● | | - | 13 | 7.1 | 1 |

●: Line-up

# STANDARD CUTTING CONDITIONS

## SNGU13/ONGU05

| ISO | Workpiece material | | Hardness | Priority | Grade | Chip-breaker | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) |
|---|---|---|---|---|---|---|---|---|
| P | Low carbon steel C15, etc. | | 200 - 300 HB | First choice | AH3135 | MJ | 100 - 250 | 0.1 - 0.5 |
| | | | 200 - 300 HB | For wear resistance | T3225 | MJ | 200 - 350 | 0.1 - 0.4 |
| | High carbon and alloy steel C55, 42CrMo4, etc. | | 150 - 300 HB | First choice | AH3135 | MJ | 100 - 250 | 0.1 - 0.4 |
| | | | 150 - 300 HB | For wear resistance | T3225 | MJ | 180 - 300 | 0.1 - 0.4 |
| | Prehardened steel NAK80, PX5, etc. | | 30 - 40 HRC | First choice | AH3135 | MJ | 100 - 200 | 0.1 - 0.4 |
| | | | 30 - 40 HRC | For wear resistance | T3225 | MJ | 150 - 250 | 0.1 - 0.4 |
| M | Stainless steel X5CrNi18-9, X5CrNiMo17-12-3, etc. | | ~ 200 HB | First choice | AH3135 | MJ | 100 - 200 | 0.1 - 0.35 |
| | | | ~ 200 HB | For wear resistance | T3225 | MJ | 100 - 250 | 0.1 - 0.3 |
| | Stainless cast steel GX40NiCrSiNb38-19, etc. | | - | First choice | T3225 | MH | 60 - 120 | 0.1 - 0.3 |
| | | | - | Second choice | AH3135 | MJ | 60 - 120 | 0.1 - 0.3 |
| K | Gray cast iron 250, etc. | | 150 - 250 HB | First choice | AH120 | MJ | 100 - 250 | 0.1 - 0.5 |
| | Ductile cast iron 400-15, 600-3, etc. | | 150 - 250 HB | First choice | AH120 | MJ | 80 - 200 | 0.1 - 0.5 |
| S | Titanium alloys Ti-6Al-4V, etc. | | ~ 40 HRC | First choice | AH3135 | MJ | 30 - 60 | 0.1 - 0.3 |
| | Heat-resistant alloys Inconel718, etc. | | ~ 40 HRC | First choice | AH120 | MJ | 10 - 40 | 0.05 - 0.15 |
| H | Hardened steel | X40CrMoV5-1, etc. | 40 - 50 HRC | First choice | AH3135 | MJ | 80 - 130 | 0.1 - 0.2 |
| | | X153CrMoV12, etc. | 50 - 60 HRC | First choice | AH120 | MJ | 50 - 70 | 0.03 - 0.1 |

## RNGU13

| ISO | Workpiece material | | Hardness | Grade | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) |
|---|---|---|---|---|---|---|
| P | Carbon steel C45, C55, etc. | | 200 - 300 HB | AH3135 | 100 - 250 | ap = 6 mm : 0.1 - 0.3<br>ap = 2 mm : 0.4 - 0.8<br>ap = 1 mm : 0.8 - 1.5 |
| | Alloy steel 42CrMo4, SCr145, etc. | | 150 - 300 HB | AH3135 | 100 - 250 | ap = 6 mm : 0.1 - 0.3<br>ap = 2 mm : 0.4 - 0.8<br>ap = 1 mm : 0.8 - 1.5 |
| | Prehardened steel NAK80, PX5, etc. | | 30 - 40 HRC | AH3135 | 100 - 200 | ap = 6 mm : 0.1 - 0.3<br>ap = 2 mm : 0.4 - 0.8<br>ap = 1 mm : 0.8 - 1.5 |
| M | Stainless steel X5CrNi18-9, X5CrNiMo17-12-3, etc. | | - 200 HB | AH3135 | 100 - 200 | ap = 6 mm : 0.1 - 0.25<br>ap = 2 mm : 0.3 - 0.7<br>ap = 1 mm : 0.6 - 1.3 |
| K | Gray cast iron 250, etc. | | 150 - 250 HB | AH120 | 100 - 250 | ap = 6 mm : 0.1 - 0.3<br>ap = 2 mm : 0.4 - 0.8<br>ap = 1 mm : 0.8 - 1.5 |
| | Ductile cast iron 400-15, 600-3, etc. | | 150 - 250 HB | AH120 | 80 - 200 | ap = 6 mm : 0.1 - 0.3<br>ap = 2 mm : 0.4 - 0.8<br>ap = 1 mm : 0.8 - 1.5 |
| S | Titanium alloys Ti-6Al-4V, etc. | | - 40 HRC | AH3135 | 30 - 60 | ap = 1 mm : 0.15 - 0.8 |
| | Heat-resistant alloys Inconel718, etc. | | - 40 HRC | AH120 | 10 - 40 | ap = 1 mm : 0.05 - 0.3 |
| H | Hardened steel | X40CrMoV5-1, etc. | 40 - 50 HRC | AH3135 | 80 - 130 | ap = 1 mm : 0.1 - 0.25 |
| | | X153CrMoV12, etc. | 50 - 60 HRC | AH120 | 50 - 70 | ap = 0.5 mm : 0.03 - 0.1 |

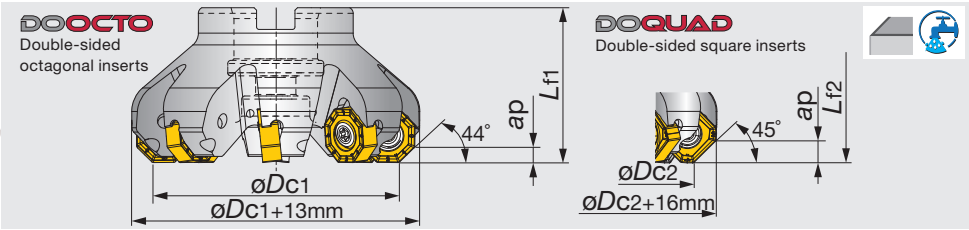
# DOOCTO DOQUAD

## TAN07

45° screw clamp type face mills with double sided octagonal or square inserts

A.R.=-6°,R.R.=+15.5°

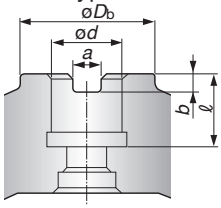




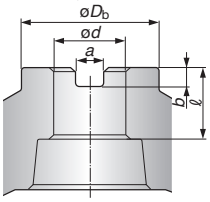

| Designation | øDc1 | øDc2 | z | øDb | Lf1 | Lf2 | ød | ℓ | a | b | Kg | Air hole | Insert | Arbor type |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TAN07R063M22.0E05 | 63 | 60.3 | 5 | 41 | 40 | 41.4 | 22 | 20 | 10.4 | 6.3 | 0.5 | with | SN*U/ON*U/OWMT | A |
| TAN07R063M22.0E06 | 63 | 60.3 | 6 | 41 | 40 | 41.4 | 22 | 20 | 10.4 | 6.3 | 0.5 | with | SN*U/ON*U/OWMT | A |
| TAN07R080M27.0E06 | 80 | 77.3 | 6 | 50 | 50 | 51.4 | 27 | 22 | 12.4 | 7 | 1 | with | SN*U/ON*U/OWMT | A |
| TAN07R080M27.0E08 | 80 | 77.3 | 8 | 50 | 50 | 51.4 | 27 | 22 | 12.4 | 7 | 1 | with | SN*U/ON*U/OWMT | A |
| TAN07R100M32.0E07 | 100 | 97.3 | 7 | 60 | 50 | 51.4 | 32 | 28.5 | 14.4 | 8 | 1.5 | with | SN*U/ON*U/OWMT | B |
| TAN07R100M32.0E10 | 100 | 97.3 | 10 | 60 | 50 | 51.4 | 32 | 28.5 | 14.4 | 8 | 1.5 | with | SN*U/ON*U/OWMT | B |
| TAN07R125M40.0E08 | 125 | 122.3 | 8 | 71 | 63 | 64.4 | 40 | 29 | 16.4 | 9 | 2.5 | with | SN*U/ON*U/OWMT | B |
| TAN07R125M40.0E12 | 125 | 122.3 | 12 | 71 | 63 | 64.4 | 40 | 29 | 16.4 | 9 | 2.5 | with | SN*U/ON*U/OWMT | B |
| TAN07R160M40.0E10 | 160 | 157.3 | 10 | 100 | 63 | 64.4 | 40 | 29 | 16.4 | 9 | 4 | without | SN*U/ON*U/OWMT | D |
| TAN07R160M40.0E15 | 160 | 157.3 | 15 | 100 | 63 | 64.4 | 40 | 29 | 16.4 | 9 | 4 | without | SN*U/ON*U/OWMT | D |
| TAN07R200M60.0E12 | 200 | 197.3 | 12 | 135 | 63 | 64.4 | 60 | 38 | 25.7 | 14 | 6.5 | without | SN*U/ON*U/OWMT | C |
| TAN07R200M60.0E18 | 200 | 197.3 | 18 | 135 | 63 | 64.4 | 60 | 38 | 25.7 | 14 | 6.5 | without | SN*U/ON*U/OWMT | C |
| TAN07R250M60.0E15 | 250 | 247.3 | 15 | 130 | 63 | 64.4 | 60 | 38 | 25.7 | 14 | 9 | without | SN*U/ON*U/OWMT | C |
| TAN07R250M60.0E21 | 250 | 247.3 | 21 | 130 | 63 | 64.4 | 60 | 38 | 25.7 | 14 | 9 | without | SN*U/ON*U/OWMT | C |
| TAN07R315M60.0E18 | 315 | 312.3 | 18 | 220 | 80 | 81.4 | 60 | 38 | 25.7 | 14 | 18 | without | SN*U/ON*U/OWMT | E |
| TAN07R315M60.0E24 | 315 | 312.3 | 24 | 220 | 80 | 81.4 | 60 | 38 | 25.7 | 14 | 18 | without | SN*U/ON*U/OWMT | E |

## Arbor type

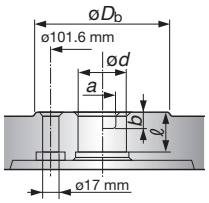
Arbor type A



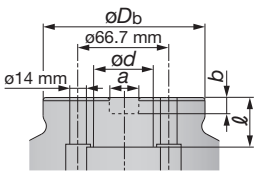

Arbor type B



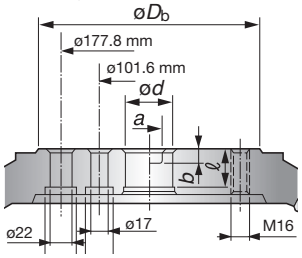

Arbor type C




Arbor type D




Arbor type E




### SPARE PARTS

| Designation | Clamping screw | Grip | Shell locking bolt | Shell locking bolt 1 | Torx bit |
|---|---|---|---|---|---|
| TAN07R063M22.0... | SRM5X0.8IP20X+ACROLYTE | H-TB | - | CM10X30H | BLDIP20/S7 |
| TAN07R080M27.0... | SRM5X0.8IP20X+ACROLYTE | H-TB | - | CM12X30H | BLDIP20/S7 |
| TAN07R100M32.0... | SRM5X0.8IP20X+ACROLYTE | H-TB | TMBA-M16H | - | BLDIP20/S7 |
| TAN07R125M40.0... | SRM5X0.8IP20X+ACROLYTE | H-TB | TMBA-M20H | - | BLDIP20/S7 |
| TAN07R160 - 315... | SRM5X0.8IP20X+ACROLYTE | H-TB | - | - | BLDIP20/M7 |

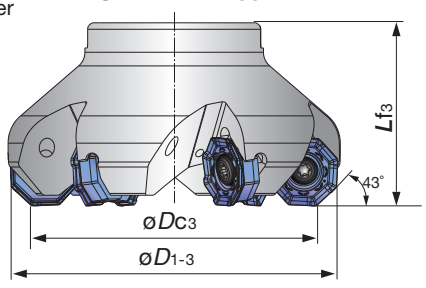


# Screw-on type

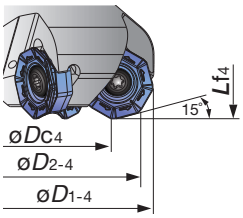
DOOCTO

Single-sided octagonal inserts
- Cutter diamerter and height

OWMT-ML insert




OWMT-HJ insert




ap = 3.5 mm

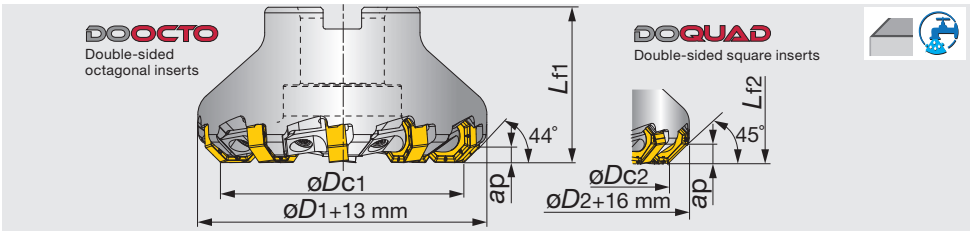
ap = 1.5 mm (7.5 mm, with double corner use)

| Designation | Dimensions (mm) | | | | | | |
|---|---|---|---|---|---|---|---|
| | øDc3 | øD1-3 | øDc4 | øD2-4 | øD1-4 | Lf3 | Lf4 |
| TAN07R063M... | 63.5 | 76 | 55.7 | 67.2 | 76.4 | 41 | 41.4 |
| TAN07R080M... | 80.5 | 93 | 72.7 | 84.2 | 93.4 | 51 | 51.4 |
| TAN07R100M... | 100.5 | 113 | 92.7 | 104.2 | 113.4 | 51 | 51.4 |
| TAN07R125M... | 125.5 | 138 | 117.7 | 129.2 | 138.4 | 64 | 64.4 |
| TAN07R160M... | 160.5 | 173 | 152.7 | 164.2 | 173.4 | 64 | 64.4 |
| TAN07R200M... | 200.5 | 213 | 192.7 | 204.2 | 213.4 | 64 | 64.4 |
| TAN07R250M... | 250.5 | 263 | 242.7 | 252.2 | 263.4 | 64 | 64.4 |
| TAN07R315M... | 315.5 | 328 | 307.7 | 319.2 | 328.4 | 64 | 64.4 |

## TAN07-W

45° wedge clamp type face mills with double sided octagonal or square inserts.

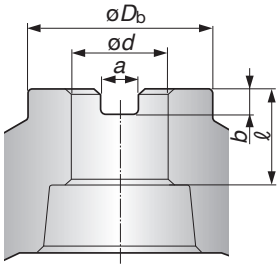




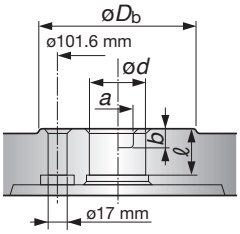

| Designation | øDc1 | øDc2 | z | øDb | Lf1 | Lf2 | ød | ℓ | a | b | Kg | Air hole | Insert | Arbor type |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TAN07R063M22.0E08W | 63 | 60.3 | 8 | 41 | 40 | 41.4 | 22 | 20 | 10.4 | 6.3 | 0.6 | without | SN*U/ON*U/OWMT | B |
| TAN07R080M27.0E10W | 80 | 77.3 | 10 | 50 | 50 | 51.4 | 27 | 25 | 12.4 | 7 | 1.1 | without | SN*U/ON*U/OWMT | B |
| TAN07R100M32.0E14W | 100 | 97.3 | 14 | 60 | 50 | 51.4 | 32 | 28.5 | 14.4 | 8 | 1.6 | without | SN*U/ON*U/OWMT | B |
| TAN07R125M40.0E18W | 125 | 122.3 | 18 | 71 | 63 | 64.4 | 40 | 29 | 16.4 | 9 | 2.5 | without | SN*U/ON*U/OWMT | B |
| TAN07R160M40.0E22W | 160 | 157.3 | 22 | 100 | 63 | 64.4 | 40 | 29 | 16.4 | 9 | 3.6 | without | SN*U/ON*U/OWMT | D |
| TAN07R200M60.0E28W | 200 | 197.3 | 28 | 135 | 63 | 64.4 | 60 | 39 | 25.7 | 14 | 5.8 | without | SN*U/ON*U/OWMT | C |

## Arbor type

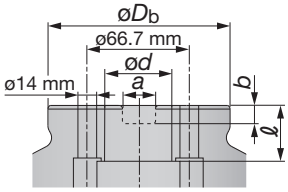
Arbor type B




Arbor type C




Arbor type D




### SPARE PARTS

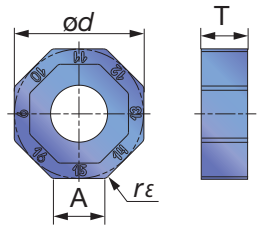
| Designation | Grip | Locator | Clamping screw | Torx bit |
|---|---|---|---|---|
| TAN07-W | H-TBS | CLARM-10-TUNG1 | DS-6P | BLDIP15/S7 |



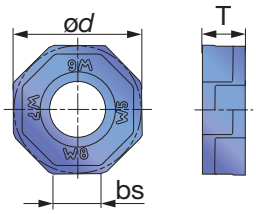
Face Milling

## INSERT

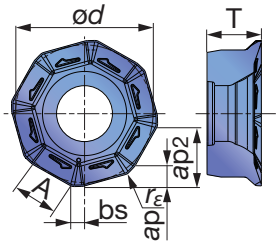
### ONMU/ONHU0705-MJ / -ML



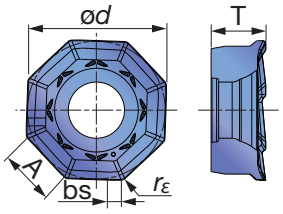

### ONHU0705-W



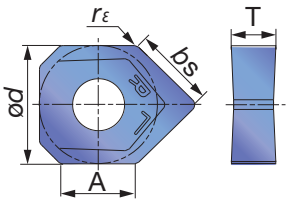

### OWMT0807-HJ



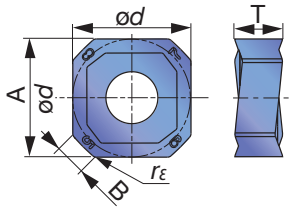

### OWMT0807-ML




### SNHU1706-W




### SNMU/SNHU1706 -MJ / -ML




| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ☆ | | | ★ | ★ | | | |
| M | Stainless | | ★ | ☆ | ☆ | ★ | | | |
| K | Cast iron | ★ | | | ☆ | | ★ | ★ | |
| N | Non-ferrous | | | | | | | | |
| S | Superalloys | ★ | ☆ | | ★ | ☆ | | | |
| H | Hard materials | | | | | | | | |

★ : First choice
☆ : Second choice

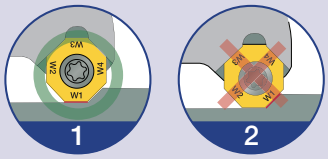
| Designation | rε | Max. ap | Coating | | | | | | | | ød | T | B | ød | bs | Max. ap2. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | AH120 | AH130 | AH140 | AH725 | AH3135 | T1115 | T1215 | | | | | | | |
| ONMU0705ANPN-MJ | 0.8 | 4.75 | | | ● | ● | ● | ● | ● | | 7.2 | 6.2 | - | 17.3 | - | - |
| ONHU0705ANPN-MJ | 0.8 | 4.75 | | | ● | ● | | | | | 7.2 | 6.2 | - | 17.3 | - | - |
| ONMU0705ANPN-ML | 0.8 | 4.75 | ● | | | | ● | | | | 7.2 | 6.2 | - | 17.3 | - | - |
| ONHU0705ANTN-ML | 0.8 | 4.75 | ● | | ● | ● | | | | | 7.2 | 6.2 | - | 17.3 | - | - |
| ONHU0705ANPR-W * | - | 4.75 | ● | | | | | | | | 7.2 | 5.8 | - | 17.5 | 6.4 | - |
| OWMT0807ZNER-HJ | 1.2 | 1.5 | | | | | ● | | | | - | 7.4 | - | 19 | 1 | 7.5 |
| OWMT0807AAER-ML | 0.8 | 3.5 | | ● | | | ● | | | | 5.2 | 7.4 | - | - | 1.2 | - |
| SNMU1706ANPR-MJ | 0.8 | 7.5 | | | ● | ● | ● | | ● | | 11 | 6.98 | 4.4 | 17.3 | 1.8 | - |
| SNHU1706ANPR-MJ | 0.8 | 7.5 | | | ● | ● | | | | | 11 | 6.98 | 4.4 | 17.3 | 1.8 | - |
| SNMU1706ANTR-ML | 0.8 | 7.5 | ● | | | | ● | | | | 11 | 6.98 | 4.4 | 17.3 | 1.8 | - |
| SNHU1706ANTR-ML | 0.8 | 7.5 | ● | | | | | | | | 11 | 6.98 | 4.4 | 17.3 | 1.8 | - |
| SNHU1706ANFN-W * | 0.4 | 7.5 | ● | | | | | | | | 17.3 | 6.5 | - | 17.3 | 11 | - |

* Pay attention to the wiper insert installation procedure below.

●: Line-up

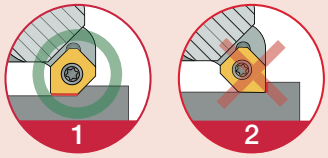
## Attention for wiper inserts

### DOOCTO




Attach only one wiper insert on the cutter and make sure the wiper edge faces the machining surface.
Feed rate: *f* < 5.5 mm/rev

### DOQUAD




Attach only one wiper insert on the cutter and make sure the wiper edge faces the machining surface.
Feed rate: *f* < 9.5 mm/rev

# STANDARD CUTTING CONDITIONS

## Double-sided inserts

| ISO | Workpiece material | Hardness | Priority | Recommendation | | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) |
|---|---|---|---|---|---|---|---|
| | | | | Grade | Chipbreaker | | |
| P | Low carbon steel C15E, etc. | - 200 HB | First choice | AH3135 | ML | 100 - 300 | 0.2 - 0.5 |
| | | - 200 HB | For wear resistance | AH725 | ML | 100 - 300 | 0.2 - 0.5 |
| | | - 200 HB | For fracture resistance | AH140 | MJ | 80 - 180 | 0.2 - 0.5 |
| | High carbon steel C45E, C55E, etc. | 200 - 300 HB | First choice | AH3135 | MJ | 100 - 230 | 0.2 - 0.4 |
| | | 200 - 300 HB | For wear resistance | AH725 | MJ | 100 - 230 | 0.2 - 0.4 |
| | | 200 - 300 HB | For fracture resistance | AH140 | MJ | 80 - 180 | 0.2 - 0.4 |
| | Alloy steel 42CrMo4, 17Cr3, etc. | 150 - 330 HB | First choice | AH3135 | MJ | 100 - 200 | 0.2 - 0.4 |
| | | 150 - 330 HB | For wear resistance | AH725 | MJ | 100 - 200 | 0.2 - 0.4 |
| | | 150 - 330 HB | For fracture resistance | AH140 | MJ | 80 - 150 | 0.2 - 0.4 |
| M | Stainless steel X5CrNi18-9, etc. | - 200 HB | First choice | AH3135 | ML | 100 - 150 | 0.1 - 0.3 |
| K | Grey cast iron 250, 300, etc. | 150 - 250 HB | First choice | AH120 | ML | 100 - 250 | 0.1 - 0.5 |
| | | 150 - 250 HB | For fracture resistance | AH725 | MJ | 100 - 250 | 0.1 - 0.5 |
| | | 150 - 250 HB | For wear resistance | T1215 | MJ | 150 - 300 | 0.1 - 0.5 |
| | Ductile cast iron 600-3, etc. | 150 - 300HB | First choice | AH120 | ML | 80 - 200 | 0.1 - 0.4 |
| | | 150 - 300 HB | For fracture resistance | AH725 | MJ | 80 - 200 | 0.1 - 0.4 |
| | | 150 - 300 HB | For wear resistance | T1215 | MJ | 100 - 250 | 0.1 - 0.4 |
| H | Hardened steel | HRC 40 - 50 | First choice | AH3135 | MJ | 80 - 130 | 0.1 - 0.2 |
| | | HRC 50 - 60 | First choice | AH3135 | MJ | 50 - 70 | 0.05 - 0.1 |

## Single-sided inserts

| ISO | Workpiece material | Hardness | Priority | Grade | Cutting speed *Vc* (m/min) | Feed per tooth: *fz* (mm/t) | |
|---|---|---|---|---|---|---|---|
| | | | | | | ML | HJ* |
| P | Low carbon steel C15E, etc. | - 200 | First choice | AH3135 | 100 - 300 | 0.1 - 0.5 | 0.5 - 2.0 |
| | | - 200 | For fracture resistance | AH130 | 100 - 300 | 0.1 - 0.5 | - |
| | High carbon steel C45E, C55E, etc. | 200 - 300 HB | First choice | AH3135 | 100 - 230 | 0.1 - 0.4 | 0.5 - 1.5 |
| | | 200 - 300 HB | For fracture resistance | AH130 | 100 - 230 | 0.1 - 0.4 | - |
| | Alloy steel 42CrMo4, 17Cr3, etc. | 150 - 330 HB | First choice | AH3135 | 100 - 200 | 0.1 - 0.4 | 0.5 - 1.5 |
| | | 150 - 330 HB | For fracture resistance | AH130 | 100 - 200 | 0.1 - 0.4 | - |
| M | Stainless steel X5CrNi18-9, etc. | - 200 HB | First choice | AH3135 | 100 - 150 | 0.1 - 0.3 | 0.3 - 0.7 |
| | | - 200 HB | For fracture resistance | AH130 | 100 - 150 | 0.1 - 0.3 | - |
| K | Grey cast iron 250, 300, etc. | 150 - 250 HB | First choice | AH3135 | 100 - 250 | 0.1 - 0.5 | 0.5 - 2.0 |
| | | 150 - 250 HB | For fracture resistance | AH130 | 100 - 250 | 0.1 - 0.5 | - |
| | Ductile cast iron 600-3, etc. | 150 - 250 HB | First choice | AH3135 | 80 - 200 | 0.1 - 0.4 | 0.5 - 1.5 |
| | | 150 - 250 HB | For fracture resistance | AH130 | 80 - 200 | 0.1 - 0.4 | - |
| S | Titanium alloy Ti-6Al-4V, etc. | - HRC 40 | First choice | AH3135 | 30 - 60 | 0.1 - 0.3 | 0.3 - 0.7 |
| | | - HRC 40 | For fracture resistance | AH130 | 30 - 60 | 0.1 - 0.3 | - |
| | Heat resistant alloy Inconel718, etc. | - HRC 40 | First choice | AH3135 | 10 - 40 | 0.05 - 0.15 | 0.1 - 0.3 |
| | | - HRC 40 | For fracture resistance | AH130 | 10 - 40 | 0.05 - 0.15 | - |
| H | Hardened steel | HRC 40 - 50 | First choice | AH3135 | 80 - 130 | - | 0.1 - 0.3 |
| | | HRC 50 - 60 | First choice | AH3135 | 50 - 70 | - | 0.03 - 0.07 |

* Apply 20% of recommended feed when using HJ insert with ap over 1.5 mm.

MEMO

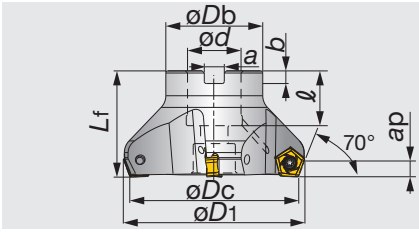
# DOPENT

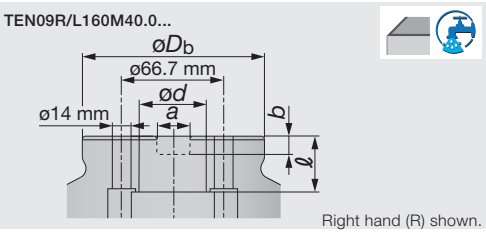
## TEN09R/L

70° face mills with double sided pentagonal inserts.

A.R.=-6°,R.R.=-10°~-2°






Right hand (R) shown.

| Designation | Max. *ap* | ø*D*c | z | ø*D*1 | ø*D*b | *L*f | ø*d* | *ℓ* | *a* | *b* | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TEN09R050M22.0E04 | 6.4 | 50 | 4 | 56 | 41 | 40 | 22 | 20 | 10.4 | 6.3 | 0.3 | with | PN*U0905... |
| TEN09R050M22.0E06 | 6.4 | 50 | 6 | 56 | 41 | 40 | 22 | 20 | 10.4 | 6.3 | 0.3 | with | PN*U0905... |
| TEN09R063M22.0E06 | 6.4 | 63 | 6 | 69 | 41 | 40 | 22 | 20 | 10.4 | 6.3 | 0.5 | with | PN*U0905... |
| TEN09R063M22.0E08 | 6.4 | 63 | 8 | 69 | 41 | 40 | 22 | 20 | 10.4 | 6.3 | 0.5 | with | PN*U0905... |
| TEN09R080M27.0E07 | 6.4 | 80 | 7 | 86 | 50 | 50 | 27 | 22 | 12.4 | 7 | 0.9 | with | PN*U0905... |
| TEN09R080M27.0E10 | 6.4 | 80 | 10 | 86 | 50 | 50 | 27 | 22 | 12.4 | 7 | 1 | with | PN*U0905... |
| TEN09R/L100M32.0E08* | 6.4 | 100 | 8 | 106 | 60 | 50 | 32 | 28.5 | 14.4 | 8 | 1.3 | with | PN*U0905... |
| TEN09R100M32.0E12 | 6.4 | 100 | 12 | 106 | 60 | 50 | 32 | 28.5 | 14.4 | 8 | 1.4 | with | PN*U0905... |
| TEN09R/L125M40.0E10* | 6.4 | 125 | 10 | 131 | 71 | 63 | 40 | 32 | 16.4 | 9 | 2.3 | with | PN*U0905... |
| TEN09R125M40.0E16 | 6.4 | 125 | 16 | 131 | 71 | 63 | 40 | 32 | 16.4 | 9 | 2.5 | with | PN*U0905... |
| TEN09R/L160M40.0E12* | 6.4 | 160 | 12 | 166 | 100 | 63 | 40 | 29 | 16.4 | 9 | 4 | without | PN*U0905... |
| TEN09R160M40.0E20 | 6.4 | 160 | 20 | 166 | 100 | 63 | 40 | 29 | 16.4 | 9 | 4.3 | without | PN*U0905... |

* For TEN09L (left-hand cutter), use the neutral-hand inserts.

### SPARE PARTS

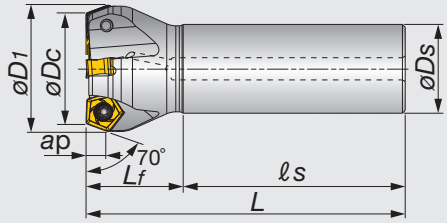
| Designation | Clamping screw | Grip | Lubricant | Shell locking bolt | Shell locking bolt 1 | Torx bit |
|---|---|---|---|---|---|---|
| TEN09R050 - 063... | CSTR-4L100 | H-TBS | M-1000 | - | CM10X30H | BT15S |
| TEN09R080... | CSTR-4L100 | H-TBS | M-1000 | - | CM12X30H | BT15S |
| TEN09R/L100... | CSTR-4L100 | H-TBS | M-1000 | TMBA-M16H | - | BT15S |
| TEN09R/L125M...10 | CSTR-4L100 | H-TBS | M-1000 | TMBA-M20H | - | BT15M |
| TEN09R125M...16 | CSTR-4L100 | H-TBS | M-1000 | TMBA-M20H | - | BT15S |
| TEN09R/L160M...12 | CSTR-4L100 | H-TBS | M-1000 | - | - | BT15M |
| TEN09R160M...20 | CSTR-4L100 | H-TBS | M-1000 | - | - | BT15S |

## EEN09

70° endmills with double sided pentagonal inserts.

A.R.=-6°,R.R.=-2°~-10°

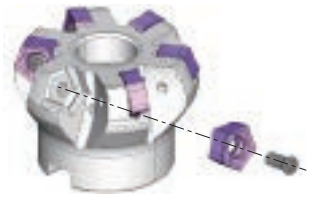





| Designation | Max. ap | øDc | z | øD1 | øDs | ℓs | Lf | L | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| EEN09R032M32.0-03 | 6.4 | 32 | 3 | 38 | 32 | 80 | 35 | 115 | 0.7 | with | PN*U0905... |
| EEN09R040M32.0-04 | 6.4 | 40 | 4 | 46 | 32 | 80 | 35 | 115 | 0.7 | with | PN*U0905... |
| EEN09R050M32.0-04 | 6.4 | 50 | 4 | 56 | 32 | 80 | 40 | 120 | 0.9 | with | PN*U0905... |
| EEN09R063M32.0-06 | 6.4 | 63 | 6 | 69 | 32 | 80 | 40 | 120 | 1 | with | PN*U0905... |
| EEN09R080M32.0-07 | 6.4 | 80 | 7 | 86 | 32 | 80 | 40 | 120 | 1.3 | with | PN*U0905... |

### SPARE PARTS

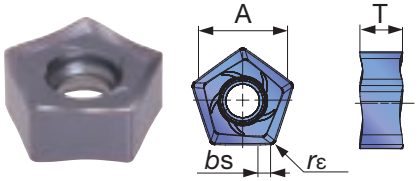
| Designation | Clamping screw | Lubricant | Wrench |
|---|---|---|---|
| EEN09 | CSTR-4L100 | M-1000 | T-15D |



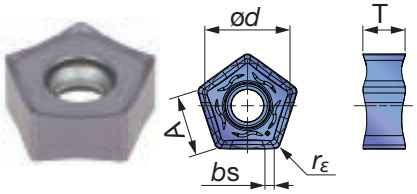
Face Milling

## INSERT

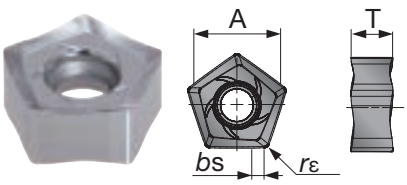
### PNCU0905-MJ (Right-hand)



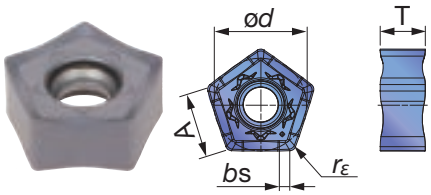

### PNCU0905-ML (Neutral-hand)



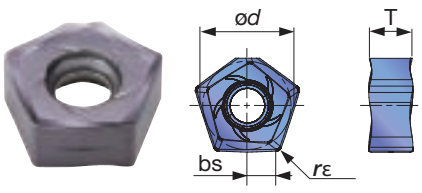

### PNCU0905-AJ (Right-hand)




### PNMU0905-MJ (Neutral-hand)




### PNCU0905-W (Right-hand)




| | | AH120 | AH140 | AH725 | AH3135 | T1115 | T1215 | T3130 | NS740 | TH10 |
|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ☆ | | ★ | ★ | | | ☆ | ★ | |
| M | Stainless | | ☆ | ☆ | ★ | | | | | |
| K | Cast iron | ★ | | ☆ | | ★ | ★ | | | |
| N | Non-ferrous | | | | | | | | | ★ |
| S | Superalloys | ☆ | | ★ | ☆ | | | | | |
| H | Hard materials | | | | | | | | | |

★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | Coating | | | | | | | Cermet | Un-coated | A | T | ød | bs |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | AH120 | AH140 | AH725 | AH3135 | T1115 | T1215 | T3130 | NS740 | TH10 | | | | |
| PNCU0905GNER-MJ | 0.8 | 6.4 | ● | ● | ● | | ● | | ● | ● | | 8.9 | 5.93 | 12.2 | 1.4 |
| PNCU0905GNEN-ML | 0.8 | 6.4 | | | | ● | | | | | | 8.9 | 5.96 | 12.2 | 1.4 |
| PNCU0905GNFR-AJ | 0.8 | 6.4 | | | | | | | | | ● | 8.9 | 6.25 | 12.2 | 1.4 |
| PNMU0905GNEN-MJ | 0.8 | 6.4 | ● | | | ● | | ● | | | | 8.9 | 6 | 12.2 | 1.4 |
| PNCU0905GNER-W | 0.8 | 2 | | | ● | | | | | | | - | 5.93 | 12.2 | 3.8 |

●: Line-up

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Hardness HB | Selection criteria | Recommended grade | Chip-breaker | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) |
|---|---|---|---|---|---|---|---|
| P | Low carbon steel C15, etc. | - 200 | First choice | AH3135, AH725 | MJ | 100 - 250 | 0.1 - 0.6 |
| | | - 200 | Low cutting force | AH3135 | ML | 100 - 250 | 0.1- 0.5 |
| | | - 200 | Priority on wear resistance | T3130 | MJ | 120 - 250 | 0.1 - 0.6 |
| | | - 200 | Priority on surface quality | NS740 | MJ | 100 - 250 | 0.1 - 0.5 |
| | High carbon steel C45, etc. | 200 - 300 | First choice | AH3135, AH725 | MJ | 100 - 230 | 0.1 - 0.5 |
| | | 200 - 300 | Low cutting force | AH3135 | ML | 100 - 230 | 0.1- 0.4 |
| | | 200 - 300 | Priority on wear resistance | T3130 | MJ | 120 - 250 | 0.1 - 0.5 |
| | | 200 - 300 | Priority on surface quality | NS740 | MJ | 100 - 250 | 0.1 - 0.4 |
| | Alloyed steel 42CrMo4, etc. | 150 - 300 | First choice | AH3135, AH725 | MJ | 100 - 230 | 0.1 - 0.5 |
| | | 150 - 300 | Low cutting force | AH3135 | ML | 100 - 230 | 0.1- 0.4 |
| | | 150 - 300 | Priority on wear resistance | T3130 | MJ | 120 - 250 | 0.1 - 0.5 |
| | | 150 - 300 | Priority on fracture resistance | NS740 | MJ | 100 - 250 | 0.1 - 0.4 |
| | Tool steel X153CrMoV12, etc. | - 300 | First choice | AH3135, AH725 | MJ | 100 - 180 | 0.1 - 0.5 |
| | | - 300 | Low cutting force | AH3135 | ML | 100 - 180 | 0.1- 0.4 |
| | | - 300 | Priority on wear resistance | T3130 | MJ | 120 - 180 | 0.1 - 0.5 |
| M | Stainless steel X5CrNi18-9, etc. | - | First choice | AH3135 | ML | 90 - 180 | 0.1 - 0.4 |
| | | - | Priority on fracture resistance | AH3135, AH140 | MJ | 90 - 180 | 0.1 - 0.45 |
| K | Grey cast irons 250, etc. | - | First choice | AH120 | MJ | 140 - 250 | 0.1 - 0.6 |
| | | - | Priority on wear resistance | T1215 | MJ | 150 - 280 | 0.1 - 0.6 |
| | Ductile cast iron 400-15S, etc. | - | First choice | AH120 | MJ | 100 - 200 | 0.1 - 0.6 |
| | | - | Priority on wear resistance | T1215 | MJ | 120 - 220 | 0.1 - 0.6 |
| N | Aluminium alloys Si < 13% | - | First choice | TH10 | AJ | 500 - 1500 | 0.1 - 0.5 |
| | Aluminium alloys Si ≥ 13% | - | First choice | TH10 | AJ | 150 - 500 | 0.1 - 0.5 |
| S | Titanium alloys Ti-6Al-4V, etc. | - | First choice | AH3135 | ML | 30 - 60 | 0.1 - 0.4 |
| | | - | Priority on fracture resistance | AH3135 | MJ | 30 - 60 | 0.1 - 0.4 |
| | Heat-resistance alloys Inconel 718, etc. | - | First choice | AH725 | MJ | 20 - 50 | 0.04 - 0.1 |

· Remove excessive chip with an air blast to prevent chip jamming.
· Use water-soluble coolant to avoid built-up edge in case extreme welding occurs on cutting edges. (ex. aluminium machining).
· For the operation with depth of cut which varies (ex. casting skin) and machining of workpiece materials with interrupted surface, the feed (*fz*) should be set to the lower recommened value shown in the above table.
· Cutting conditions may be limited depending on machine power, workpiece rigidity, and spindle output. When the cutting width, depth or overhang length is large, set *Vc* and *fz* to the lower recommended values and check the machine power and vibration.

## Installation of the extra close pitch cutter inserts

- The extra close pitch cutter has a slanted screw.
- Locate insert and then fasten the screw. (Fig. A)
- Appropriate torque is 3.5 N·m.
- After fastening the screw, please ensure there is no space between the cutter body and insert. (Fig. B)

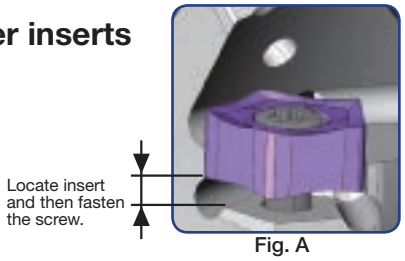
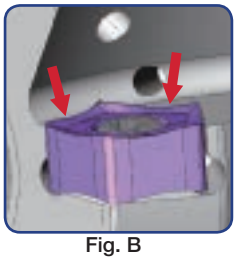


Fig. A


Fig. B

## NOTES ON USE OF WIPER INSERT

- To achieve a good surface finish, a wiper insert is recommended. (PNCU0905GNER-W)
- When using the wiper insert, install the insert as shown in Fig. C. Ensure that the groove is at the front as shown in Fig. D.
- The wiper insert has two wiping corners. (Fig. D)
- Do not use the other corners. It may break the tool body.

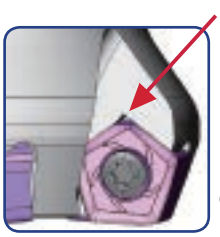


Fig. C

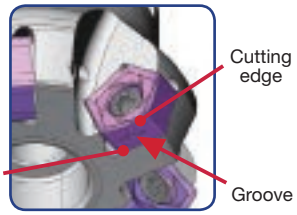


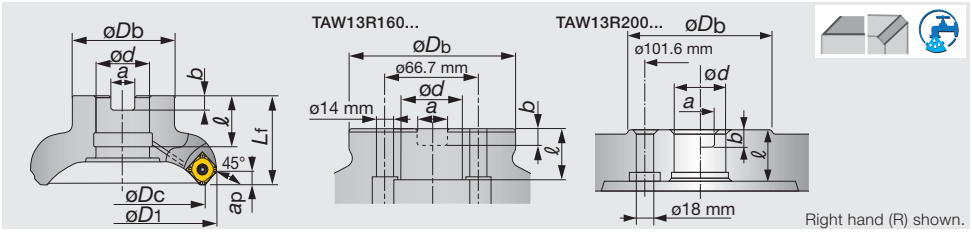
Fig. D

# TAW13

## 30°~ 45° face mills with screw clamped SWMT/SWGT13 inserts

A.R.=+17°~+20°,R.R.=-16°~-11°



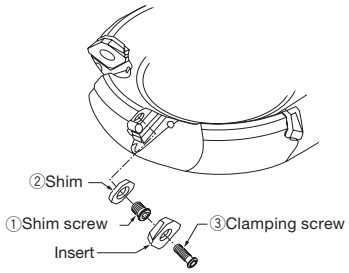



Right hand (R) shown.

| Designation | øDc | z | øD1 | Lf | ød | ℓ | a | b | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TAW13R050M22.0E04 | 50 | 4 | 63 | 40 | 22 | 20 | 10.4 | 6.3 | 0.4 | with | SW*T13/WWCW13... |
| TAW13R050M22.0E05 | 50 | 5 | 63 | 40 | 22 | 20 | 10.4 | 6.3 | 0.4 | with | SW*T13/WWCW13... |
| TAW13R063M22.0E05 | 63 | 5 | 76 | 40 | 22 | 20 | 10.4 | 6.3 | 0.6 | with | SW*T13/WWCW13... |
| TAW13R063M22.0E06 | 63 | 6 | 76 | 40 | 22 | 20 | 10.4 | 6.3 | 0.6 | with | SW*T13/WWCW13... |
| TAW13R080M27.0E06 | 80 | 6 | 94 | 50 | 27 | 22 | 12.4 | 7 | 1 | with | SW*T13/WWCW13... |
| TAW13R080M27.0E08 | 80 | 8 | 94 | 50 | 27 | 22 | 12.4 | 7 | 1 | with | SW*T13/WWCW13... |
| TAW13R100M32.0E07 | 100 | 7 | 114 | 50 | 32 | 28.5 | 14.4 | 8 | 1.5 | with | SW*T13/WWCW13... |
| TAW13R100M32.0E10 | 100 | 10 | 114 | 50 | 32 | 28.5 | 14.4 | 8 | 1.5 | with | SW*T13/WWCW13... |
| TAW13R125M40.0E08 | 125 | 8 | 139 | 63 | 40 | 32 | 16.4 | 9 | 2.7 | with | SW*T13/WWCW13... |
| TAW13R125M40.0E12 | 125 | 12 | 139 | 63 | 40 | 32 | 16.4 | 9 | 3 | with | SW*T13/WWCW13... |
| TAW13R160M40.0E10 | 160 | 10 | 174 | 63 | 40 | 29 | 16.4 | 9 | 4.4 | without | SW*T13/WWCW13... |
| TAW13R160M40.0E16 | 160 | 16 | 174 | 63 | 40 | 29 | 16.4 | 9 | 4.4 | without | SW*T13/WWCW13... |

## SPARE PARTS

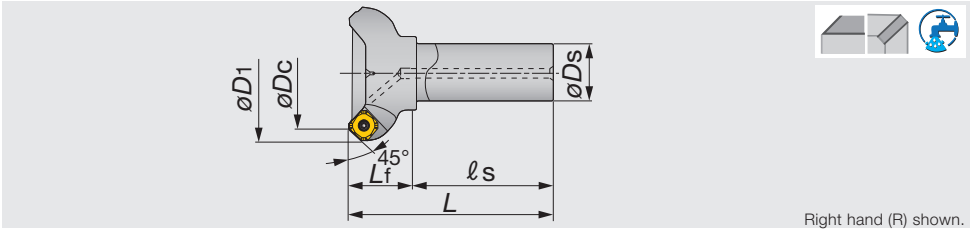
| Designation | ③Clamping screw | Lubricant | ①Shim screw | Shell locking bolt | Shell locking bolt 1 | ②Shim | Wrench | Wrench 1 |
|---|---|---|---|---|---|---|---|---|
| TAW13R050 - 063... | CSPB-3.5 | M-1000 | DTS5-3.5SS | - | CM10X30H | FSSA1102 | IP-15D | P-3.5 |
| TAW13R080... | CSPB-3.5 | M-1000 | DTS5-3.5SS | - | CM12X30H | FSSA1102 | IP-15D | P-3.5 |
| TAW13R100... | CSPB-3.5 | M-1000 | DTS5-3.5SS | TMBA-M16H | - | FSSA1102 | IP-15D | P-3.5 |
| TAW13R125... | CSPB-3.5 | M-1000 | DTS5-3.5SS | TMBA-M20H | - | FSSA1102 | IP-15D | P-3.5 |
| TAW13R160... | CSPB-3.5 | M-1000 | DTS5-3.5SS | - | - | FSSA1102 | IP-15D | P-3.5 |



## 30°~ 45° endmills with screw crlamped SWMT/SWGT13 inserts

A.R.=+17°~+20°,R.R.=-16°~-11°



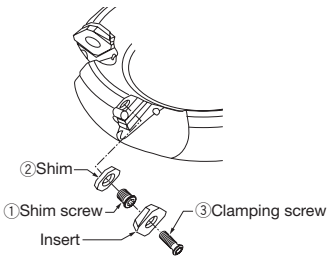



Right hand (R) shown.

| Designation | øDc | z | øD1 | øDs | ℓs | Lf | L | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| EAW13R025M25.0-02 | 25 | 2 | 39 | 25 | 80 | 35 | 115 | 0.4 | with | SW*T13/WWCW13... |
| EAW13R032M32.0-02 | 32 | 2 | 46 | 32 | 80 | 35 | 115 | 0.7 | with | SW*T13/WWCW13... |
| EAW13R040M32.0-03 | 40 | 3 | 54 | 32 | 80 | 35 | 115 | 0.8 | with | SW*T13/WWCW13... |
| EAW13R050M32.0-03 | 50 | 3 | 63 | 32 | 80 | 40 | 120 | 1 | with | SW*T13/WWCW13... |
| EAW13R050M32.0-04 | 50 | 4 | 63 | 32 | 80 | 40 | 120 | 0.9 | with | SW*T13/WWCW13... |
| EAW13R063M32.0-04 | 63 | 4 | 76 | 32 | 80 | 40 | 120 | 1.1 | with | SW*T13/WWCW13... |
| EAW13R063M32.0-05 | 63 | 5 | 76 | 32 | 80 | 40 | 120 | 1.1 | with | SW*T13/WWCW13... |
| EAW13R080M32.0-04 | 80 | 4 | 94 | 32 | 80 | 40 | 120 | 1.5 | with | SW*T13/WWCW13... |
| EAW13R080M32.0-06 | 80 | 6 | 94 | 32 | 80 | 40 | 120 | 1.4 | with | SW*T13/WWCW13... |

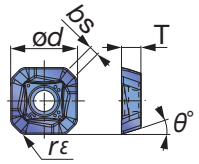
### SPARE PARTS

| Designation | ③Clamping screw | Lubricant | ①Shim screw | ②Shim | Wrench | Wrench 1 |
|---|---|---|---|---|---|---|
| EAW13R025**~040** | CSPB-3.5 | M-1000 | - | - | IP-15D | - |
| EAW13R050**~080** | CSPB-3.5 | M-1000 | DTS5-3.5SS | FSSA1102 | IP-15D | P-3.5 |

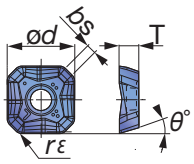


## INSERT

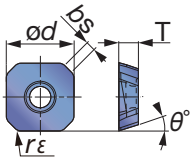
### SWMT13T3-MJ



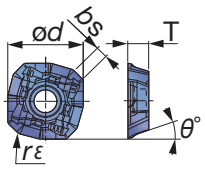

### SWMT13T3-ML



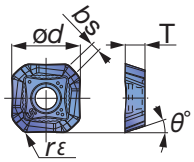

### SWMW13T3



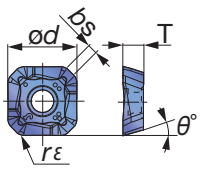

### SWMT13T3-HJ



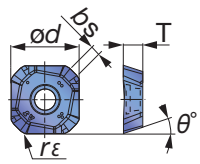

### SWMT13T3-MS



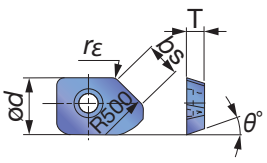

### SWGT13T3-MJ



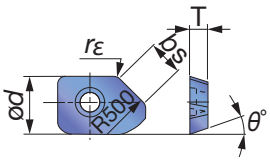

### SWGT13T3-AJ



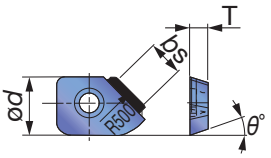

### WWCW13T3AFER-WS




### WWCW13T3AFFR-WS




### WWCW13T3AFFR-WD




| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ☆ | | | ★ | | | | ★ | | | | ★ | | | | |
| M | Stainless | | ★ | ☆ | ★ | | | | | | | | | | | | |
| K | Cast iron | ★ | | | | ★ | ★ | ★ | | | | | | | | | |
| N | Non-ferrous | | | | | | | | | ★ | | | | ★ | | ★ | |
| S | Superalloys | ★ | ☆ | | ☆ | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | |

★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | Coating | | | | | | | | | | Cermet | | Un-coated | | PCD | | ød | T | θ° | bs |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | AH120 | AH130 | AH140 | AH3135 | GH110 | T1115 | T1215 | T3130 | DS1100 | | NS740 | | KS05F | | DX140 | | | | | |
| SWMT13T3AFPR-MJ | 1.5 | 4 | ● | ● | ● | ● | | ● | ● | ● | | | ● | | | | | | 13.9 | 4 | 18.5 | 2 |
| SWMT13T3AFER-ML | 1.5 | 2.5 | ● | | | | | | | | | | | | | | | | 13.9 | 4 | 18.5 | 2 |
| SWMW13T3AFTR | 1.5 | 5 | ● | | | | | ● | ● | ● | | | ● | | | | | | 13.9 | 4 | 18.5 | 2 |
| SWMT13T3AFPR-HJ | 1.5 | 2 | ● | ● | ● | | | ● | ● | ● | | | | | | | | | 14.7 | 4 | 18.5 | 2.3 |
| SWMT13T3AFPR-MS | 1 | 4 | | ● | ● | ● | | | | | | | | | | | | | 14.1 | 4 | 18.5 | 2 |
| SWGT13T3AFPR-MJ | 1.5 | 4 | ● | | | | | | | | | | ● | | | | | | 13.9 | 4 | 18.5 | 2 |
| SWGT13T3AFFR-AJ | 1.3 | 4 | | | | | | | | | ● | | | | ● | | | | 14.1 | 4 | 18.5 | 2 |
| WWCW13T3AFER-WS | 1.5 | - | | | | | ● | | | | | | ● | | | | | | 12.8 | 4 | 18.5 | 7.8 |
| WWCW13T3AFFR-WS | 1.5 | - | | | | | | | | | ● | | | | ● | | | | 12.8 | 4 | 18.5 | 7.8 |
| WWCW13T3AFFR-WD | - | - | | | | | | | | | | | | | | | ● | | 12.8 | 4 | 18.5 | 7.8 |

●: Line-up
DX140 : Packing Quantity = 1 pc.

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Priority | Grade | Cutting speed *vc* (m/min) | Roughing (Depth of cut: > 1.0 mm) Feed per tooth: *fz* (mm/t) MJ | ML | HJ | MS | Flat | AJ |
|---|---|---|---|---|---|---|---|---|---|---|
| P | Mild and low carbon steels E275A, etc. < 180 HB | First choice | AH3135 AH120 | 100 - 270 | 0.05 - 0.3 | 0.05 - 0.25 | 0.2 - 0.6 | 0.1 - 0.25 | 0.05 - 0.3 | - |
| | | Priority on wear resistance | T3130 | 150 - 300 | 0.05 - 0.3 | - | 0.2 - 0.6 | - | 0.05 - 0.3 | - |
| | | Priority on surface quality | NS740 | 100 - 300 | 0.05 - 0.23 | - | - | - | 0.05 - 0.23 | - |
| | Carbon and alloy steels C45, 42CrMo4, etc. < 300 HB | First choice | AH3135 AH120 | 100 - 230 | 0.05 - 0.25 | 0.05 - 0.2 | 0.2 - 0.5 | - | 0.05 - 0.25 | - |
| | | Priority on wear resistance | T3130 | 150 - 280 | 0.05 - 0.25 | - | 0.2 - 0.5 | - | 0.05 - 0.25 | - |
| | | Priority on surface quality | NS740 | 100 - 230 | 0.05 - 0.2 | - | - | - | 0.05 - 0.2 | - |
| | Die steels X96CrMoV12, etc. < 30 HRC | First choice | AH3135 AH120 | 100 - 180 | 0.05 - 0.2 | 0.05 - 0.2 | 0.2 - 0.4 | - | 0.05 - 0.2 | - |
| | | Priority on wear resistance | T3130 | 100 - 180 | 0.05 - 0.2 | - | 0.2 - 0.4 | - | 0.05 - 0.2 | - |
| M | Stainless steels X5CrNi18-9, X5CrNiMo17-12-2, etc. < 250 HB | First choice | AH3135 AH130 | 80 - 200 | 0.1 - 0.25 | - | 0.2 - 0.5 | 0.1 - 0.2 | - | - |
| | | Priority on wear resistance | AH120 | 150 - 250 | 0.1 - 0.25 | 0.1 - 0.2 | 0.2 - 0.5 | - | 0.1 - 0.25 | - |
| K | Grey cast irons 250, 300, etc. | First choice | T1215 | 180 - 300 | 0.05 - 0.25 | - | 0.2 - 0.6 | - | 0.05 - 0.25 | - |
| | | Priority on impact resistance | AH120 | 150 - 250 | 0.05 - 0.25 | 0.05 - 0.2 | 0.2 - 0.6 | - | 0.05 - 0.25 | - |
| | Ductile cast irons 400-15S, 600-3, etc. | First choice | T1215 | 120 - 200 | 0.05 - 0.25 | - | 0.2 - 0.6 | - | 0.05 - 0.25 | - |
| | | Priority on impact resistance | AH120 | 100 - 180 | 0.05 - 0.25 | 0.05 - 0.2 | 0.2 - 0.6 | - | 0.05 - 0.25 | - |
| N | Aluminium alloys Si < 13 % | - | DS1100 KS05F | 300 - 1000 | - | - | - | - | - | 0.05 - 0.2 |
| | Aluminium alloys Si ≥ 13% | - | DS1100 KS05F | 80 - 300 | - | - | - | - | - | 0.05 - 0.2 |
| | Copper alloys | - | DS1100 KS05F | 200 - 500 | - | - | - | - | - | 0.05 - 0.2 |

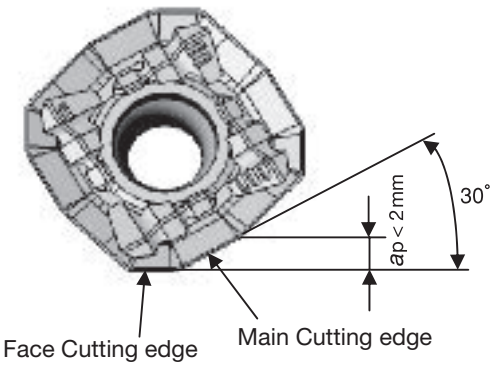


### Notes for use of HJ-type inserts

**HJ-type inserts can be used for high feed machining.**

**When using the insert, care should be taken with the following:**

- The maximum depth of cut is *ap* = 2 mm. Select feeds within the above value.
- Do not use the HJ-type inserts with other types (such as MJ- and MS-types) in the same body.
- The outer shape of the HJ-type insert is different from those of other types (such as MJ- and MS-types), but the insert can be held in the same insert pocket.




### Notes on use of wiper insert

- When requiring good surface finishes, use of a wiper insert (WWCW13T3AF_ R-W_ ) is recommended. In general, installing one wiper insert delivers superior surface finishes.
- When using the wiper insert, install the insert as shown in Fig. 1. If the insert is installed as shown in Fig. 2, breakage of the insert is inevitable and normal surface finish can not be obtained.
- The wiper insert must not be used together with HJ-type inserts
- The wiper insert has one wiping corner.
- The peripheral cutting edge of the wiper insert is retracted from the edge of the normal inserts. Therefore, the feed per tooth (*fz* mm/t) of the normal insert following

the wiper insert is double that of other inserts.

- When using the wiper insert, depth of cut (*ap*) less than 1 mm is recommended.

Fig. A

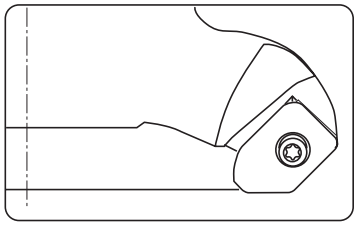
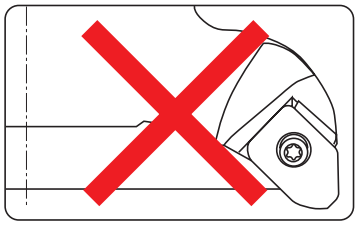


Fig. B



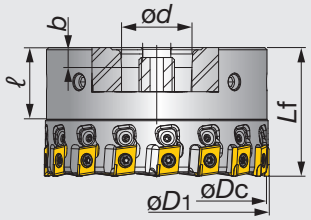
| ISO | Workpiece material | Priority | Grade | Cutting speed *vc* (m/min) | Light cutting to finishing (Depth of cut: ≤ 1.0 mm) Feed per tooth: *fz* (mm/t) MJ | ML | HJ | MS | Flat | AJ |
|---|---|---|---|---|---|---|---|---|---|---|
| P | Mild and low carbon steels E275, etc. < 180 HB | First choice | AH3135 AH120 | 100 - 270 | 0.05 - 0.25 | 0.05 - 0.2 | 0.2 - 0.6 | 0.1 - 0.2 | 0.05 - 0.25 | - |
| | | Priority on wear resistance | T3130 | 150 - 300 | 0.05 - 0.25 | - | 0.2 - 0.6 | - | 0.05 - 0.25 | - |
| | | Priority on surface quality | NS740 | 100 - 300 | 0.05 - 0.2 | - | - | - | 0.05 - 0.2 | - |
| | Carbon and alloy steels C45, 42CrMo4, etc. < 300 HB | First choice | AH3135 AH120 | 100 - 230 | 0.05 - 0.2 | 0.05 - 0.15 | 0.2 - 0.5 | - | 0.05 - 0.2 | - |
| | | Priority on wear resistance | T3130 | 150 - 280 | 0.05 - 0.2 | - | 0.2 - 0.5 | - | 0.05 - 0.2 | - |
| | | Priority on surface quality | NS740 | 100 - 230 | 0.05 - 0.18 | - | - | - | 0.05 - 0.18 | - |
| | Die steels X96CrMoV12, etc. < 30 HRC | First choice | AH3135 AH120 | 100 - 180 | 0.05 - 0.18 | 0.05 - 0.12 | 0.2 - 0.4 | - | 0.05 - 0.18 | - |
| | | Priority on wear resistance | T3130 | 100 - 180 | 0.05 - 0.18 | - | 0.2 - 0.4 | - | 0.05 - 0.18 | - |
| M | Stainless steels X5CrNi18-9, X5CrNiMo17-12-2, etc. < 250 HB | First choice | AH3135 AH130 | 80 - 200 | 0.1 - 0.2 | - | 0.2 - 0.5 | 0.1 - 0.18 | - | - |
| | | Priority on wear resistance | AH120 | 150 - 250 | 0.1 - 0.2 | 0.1 - 0.18 | 0.2 - 0.5 | - | 0.1 - 0.2 | - |
| K | Grey cast irons 250, 300, etc. | First choice | T1215 | 180 - 300 | 0.1 - 0.2 | - | 0.2 - 0.6 | - | 0.1 - 0.2 | - |
| | | Priority on impact resistance | AH120 | 150 - 250 | 0.1 - 0.2 | 0.05 - 0.18 | 0.2 - 0.6 | - | 0.1 - 0.2 | - |
| | Ductile cast irons 400-15S, 600-3, etc. | First choice | T1215 | 120 - 200 | 0.1 - 0.2 | - | 0.2 - 0.6 | - | 0.1 - 0.2 | - |
| | | Priority on impact resistance | AH120 | 100 - 180 | 0.1 - 0.2 | 0.05 - 0.18 | 0.2 - 0.6 | - | 0.1 - 0.2 | - |
| N | Aluminium alloys Si < 13 % | - | DS1100 KS05F | 300 - 1000 | - | - | - | - | - | 0.05 - 0.2 |
| | Aluminium alloys Si ≥ 13% | - | DS1100 KS05F | 80 - 300 | - | - | - | - | - | 0.05 - 0.2 |
| | Copper alloys | - | DS1100 KS05F | 200 - 500 | - | - | - | - | - | 0.05 - 0.2 |

Notes:
- When cutting at a large depth of cut or a large cutting width, the cutting speed (*vc*) and feed (*fz*) should be set to the lower side of the values shown in the above table.
- Dry cutting (or air-blowing) is generally recommended. However, when chips tend to excessively adhere to the cutting edges when machining stainless steel, use a water soluble cutting fluid. In this case, use the AH140 grade at speeds lower than *vc* = 100 m/min.
- When wet machining mild steels, carbon steels and alloy steels, use T3130 at lower cutting conditions.
- TAW13 type TAC mills cannot be used for axial-feed cutting such as ramping, plunging and drilling.

## TPYP12

High speed milling cutter with PCD insert for non ferrous materials






| Designation | øDc | øD1 | z | Lf | ød | ℓ | a | b | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TPYP12M050B22.0R08 | 50 | 51.4 | 8 | 55 | 22 | 20 | 10.4 | 6.3 | 0.9 | with | YPEB12X3-*P... |
| TPYP12M063B22.0R10 | 63 | 64.4 | 10 | 55 | 22 | 20 | 10.4 | 6.3 | 1.3 | with | YPEB12X3-*A... |
| TPYP12M080B27.0R12 | 80 | 81.4 | 12 | 58 | 27 | 22 | 12.4 | 7 | 2.2 | with | YPEB12X3-*A... |
| TPYP12M100B32.0R16 | 100 | 101.4 | 16 | 58 | 32 | 25 | 14.4 | 8 | 1.9 | with | YPEB12X3-*A... |
| TPYP12M125B40.0R20 | 125 | 126.4 | 20 | 58 | 40 | 28 | 16.4 | 9 | 2.9 | with | YPEB12X3-*A... |

*D1: Outside diameter
Dc: diameter with 01 type insert

### SPARE PARTS

| Designation | Clamping screw | Wrench | Locator fixing screw | Locator | Wrench | Cover | Center bolt |
|---|---|---|---|---|---|---|---|
| TPYP12M050B22.0R08 | VX040024A | T-15F | RSRGR5M40 | RSFTC1008 | T-8F | - | RSFTS-050M |
| TPYP12M063B22.0R10 | VX040024A | T-15F | RSRGR5M40 | RSFTC1008 | T-8F | RSFTS6063M | VC004762I10035F |
| TPYP12M080B27.0R12 | VX040024A | T-15F | RSRGR5M40 | RSFTC1008 | T-8F | RSFTS6080 | VC00TEDI12040F |
| TPYP12M100B32.0R16 | VX040024A | T-15F | RSRGR5M40 | RSFTC1008 | T-8F | RSFTS6100 | VC00TANG16040F |
| TPYP12M125B40.0R20 | VX040024A | T-15F | RSRGR5M40 | RSFTC1008 | T-8F | RSFTS6125 | VC00TEDI20040F |

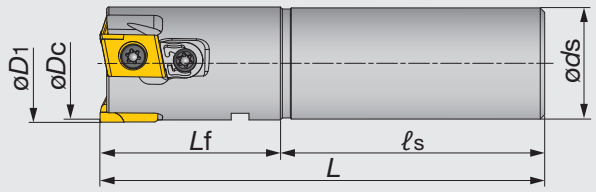




## EPYP12

High speed milling endmill with PCD insert for non ferrous materials






| Designation | øDc | øD1 | z | øDs | L | Lf | ℓs | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| EPYP12M025C25.0R03 | 25 | 26.4 | 3 | 25 | 100 | 50 | 50 | 0.4 | with | YPEB12X3-*P... |
| EPYP12M032C25.0R05 | 32 | 33.4 | 5 | 25 | 100 | 45 | 55 | 0.5 | with | YPEB12X3-*P... |

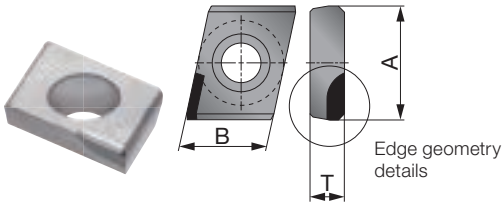
*D1: Outside diameter
Dc: diameter with 01 type insert

### SPARE PARTS

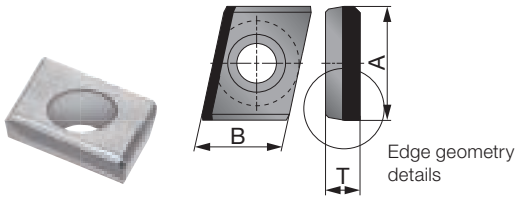
| Designation | Clamping screw | Wrench | Locator fixing screw | Locator | Wrench |
|---|---|---|---|---|---|
| EPYP12M025C25.0R03 | VX040024A | T-15F | VX040028A | RSFTC1011 | T-8F |
| EPYP12M032C25.0R05 | VX040024A | T-15F | RSRGR5M40 | RSFTC1009 | T-8F |

## INSERT

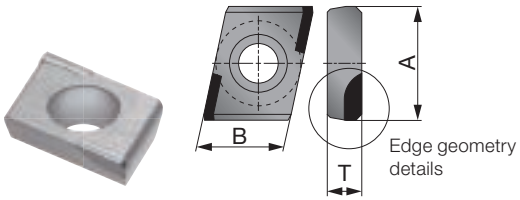
### YPEB12X3-1A/P




### YPEB12X-FP




### YPEB12X3-2A/P




### Edge geometry details

01R-D

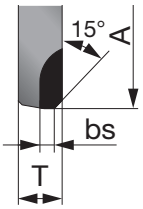



Fig.1

02R-D

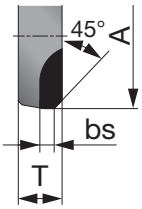



Fig.2

07R-D

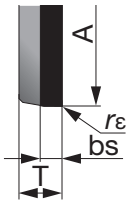



Fig.3

| | | |
|---|---|---|
| P | Steel | |
| M | Stainless | |
| K | Cast iron | |
| N | Non-ferrous | ★ |
| S | Superalloys | |
| H | Hard materials | |

★ : First choice
☆ : Second choice

| Designation | No. of corner | rε | Max. ap | PCD DX160 | A | B | T | bs | Applicable cutter diameters | Fig. |
|---|---|---|---|---|---|---|---|---|---|---|
| YPEB12X3-1A01R-D | 1 | - | 4 | ● | 12.77 | 9.525 | 3.85 | 1.59 | Dc>ϕ50mm | 1 |
| YPEB12X3-1A02R-D | 1 | - | 4 | ● | 12.756 | 9.525 | 3.85 | 1.29 | Dc>ϕ50mm | 2 |
| YPEB12X3-1A07R-D | 1 | 0.4 | 4 | ● | 12.756 | 9.525 | 3.85 | 1.34 | Dc>ϕ50mm | 3 |
| YPEB12X3-1P02R-D | 1 | - | 4 | ● | 12.817 | 9.525 | 3.85 | 1.37 | Dc≤ϕ50mm | 2 |
| YPEB12X3-1P07R-D | 1 | 0.4 | 4 | ● | 12.817 | 9.525 | 3.85 | 1.37 | Dc≤ϕ50mm | 3 |
| YPEB12X3-FP02R-D | 1 | - | 11 | ● | 12.817 | 9.525 | 3.85 | 1.37 | Dc≤ϕ50mm | 2 |
| YPEB12X3-FP07R-D | 1 | 0.4 | 11 | ● | 12.817 | 9.525 | 3.85 | 1.37 | Dc≤ϕ50mm | 3 |
| YPEB12X3-2A01R-D | 2 | - | 4 | ● | 12.8 | 9.525 | 3.868 | 1.59 | Dc>ϕ50mm | 1 |
| YPEB12X3-2A02R-D | 2 | - | 4 | ● | 12.8 | 9.525 | 3.868 | 2.07 | Dc>ϕ50mm | 2 |
| YPEB12X3-2A07R-D | 2 | 0.4 | 4 | ● | 12.8 | 9.525 | 3.868 | 2.07 | Dc>ϕ50mm | 3 |
| YPEB12X3-2P07R-D | 2 | 0.4 | 4 | ● | 12.876 | 9.525 | 3.85 | 2.07 | Dc≤ϕ50mm | 3 |

●: Line-up

Package quantity : 2pcs.



## STANDARD CUTTING CONDITIONS

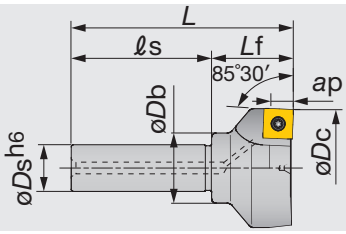
| ISO | Workpiece material | Grade | Cutting Speed Vc (m/min) | Feed per tooth fz (mm/z) |
|---|---|---|---|---|
| N | Aluminum cast Si<13% | DX160 | ≤6000 | 0.05 - 0.25 |
| | Aluminum cast Si≥13% | DX160 | ≤1500 | 0.05 - 0.25 |
| | Copper, brass, etc | DX160 | ≤2000 | 0.05 - 0.25 |
| | Non metalic material | DX160 | ≤3000 | 0.05 - 0.25 |

## EFE12R

86° endmills with screw clamped inserts for aluminum machining

A.R. = +13°, R.R. = +7°



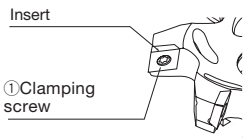



Air through type

| Designation | Max. *ap* | ø*D*c | z | ø*D*s | ø*D*b | ℓs | *L*f | *L* | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| EFE12050R | 8 | 50 | 3 | 20 | 30 | 60 | 35 | 95 | 0.37 | with | SEG*12X4... |

### SPARE PARTS

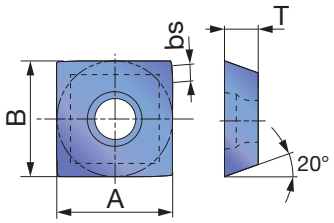
| Designation | ① Clamping screw | Lubricant | Wrench |
|---|---|---|---|
| EFE12000R | CSPB-4S | M-1000 | IP-15D |



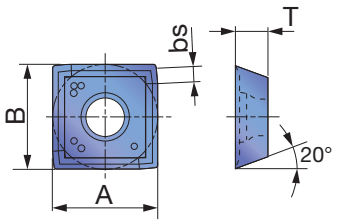

Face Milling

## INSERT

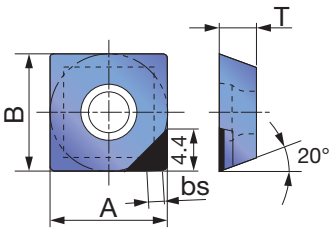
### SEGW12X4ZEPR / ZEFR



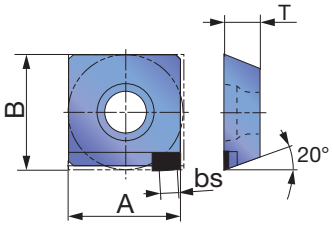

### SEGT12X4-AJ



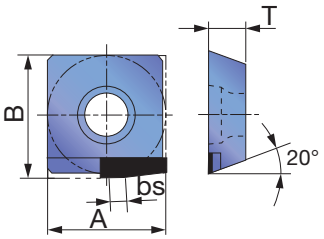

### SEGW12X4ZEFR-D




### SEGW12X4ZEFR-WD




### SEGW12X4ZEFR-BD




| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ★ | | | ★ | | | | |
| M | Stainless | | ★ | | | | | | |
| K | Cast iron | ★ | | | | | | | |
| N | Non-ferrous | | | ★ | | | ★ | | ★ |
| S | Superalloys | ★ | | | | | | | |
| H | Hard materials | | | | | | | | |

★ : First choice
☆ : Second choice

| Designation | Max. ap | Coating | | | Cermet | Un-coated | PCD | A | B | T | bs |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH140 | DS1100 | NS740 | KS05F | DX140 | | | | |
| SEGW12X4ZEFR | 8 | | | | | ● | | 12.7 | 12.7 | 4 | 1.8 |
| SEGW12X4ZEPR | 8 | ● | ● | | ● | | | 12.7 | 12.7 | 4 | 1.4 |
| SEGT12X4ZEFR-AJ | 8 | | | ● | | ● | | 12.7 | 12.7 | 4 | 1.8 |
| SEGW12X4ZEFR-D | 3.5 | | | | | | ● | 12.7 | 12.7 | 4 | 1.8 |
| SEGW12X4ZEFR-WD | - | | | | | | ● | 12.4 | 12.8 | 4 | 2 |
| SEGW12X4ZEFR-BD | - | | | | | | ● | 12.4 | 13.1 | 4 | 1.8 |

●: Line-up

DX140 : Package quantity = 1pc.

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Grade | Designation | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) |
|---|---|---|---|---|---|
| P | Carbon steels and alloy steels < 300HB | AH120 | SEGW12X4ZEPR | 100 ~ 180 | 0.03 ~ 0.15 |
| | | NS740 | SEGW12X4ZEPR | 100 ~ 180 | 0.03 ~ 0.15 |
| M | Stainless steels < 250HB | AH140 | SEGW12X4ZEPR | 80 ~ 180 | 0.03 ~ 0.15 |
| K | Grey and ductile cast irons | AH120 | SEGW12X4ZEPR | 100 ~ 200 | 0.03 ~ 0.15 |
| N | Cast aluminium alloy / Die-cast Si < 13% | KS05F | SEGT12X4ZEFR-AJ | 200 ~ 1500 | 0.05 ~ 0.2 |
| | | DX140 | SEGW12X4ZEFR-D | 200 ~ 1500 | 0.05 ~ 0.2 |
| | Cast aluminium alloy / Die-cast Si ≥ 13% | KS05F | SEGT12X4ZEFR-AJ | 80 ~ 200 | 0.05 ~ 0.2 |
| | | DX140 | SEGW12X4ZEFR-D | 200 ~ 500 | 0.05 ~ 0.2 |
| | Aluminium alloy Tensile strength < 350 N/mm$^2$ | KS05F | SEGT12X4ZEFR-AJ | 200 ~ 1500 | 0.05 ~ 0.2 |
| | | DX140 | SEGW12X4ZEFR-D | 200 ~ 1500 | 0.05 ~ 0.2 |
| | Aluminium alloy Tensile strength > 350 N/mm$^2$ | KS05F | SEGW12X4ZEFR | 200 ~ 1500 | 0.05 ~ 0.2 |
| | | DX140 | SEGW12X4ZEFR-D | 200 ~ 1500 | 0.05 ~ 0.2 |
| | Copper alloy | KS05F | SEGT12X4ZEFR-AJ | 200 ~ 500 | 0.05 ~ 0.2 |
| | | DX140 | SEGW12X4ZEFR-D | 200 ~ 500 | 0.05 ~ 0.2 |

Notes:

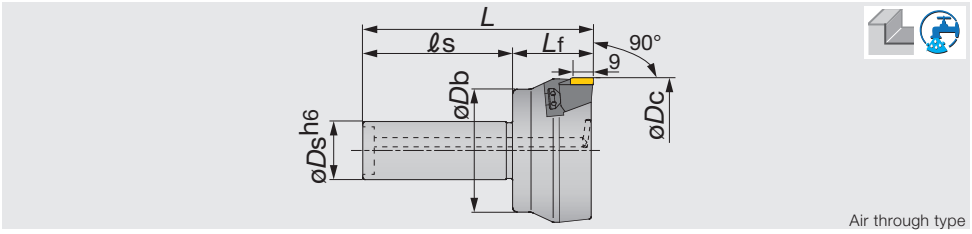
- In milling aluminium and copper alloys:
  (1) For improved surface finish, use together with wiper insert SEGW12X4ZEFR-WD
  (2) For reducing burr occurrence, use together with deburring inserts SEGW12X4ZEFR-BD
- When milling aluminium and copper alloys, use of a water soluble cutting fluid is recommended. When milling steels, cast irons, and stainless steels, dry cutting is recommended.
- When the length-to-diameter overhang ratio of the tool (L/D) exceeds 3, reduce cutting speed and feed to 70 to 80% of the values given in the table.

## EDPD09

Light weight square endmills with PCD inserts for alminum machining

A.R. = +8.5°, R.R. = +3°



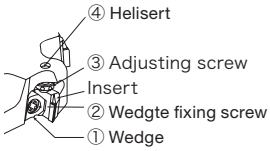



Air through type

| Designation | Max. ap | øDc | z | øDs | øDb | ℓs | Lf | L | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| EDPD09063R | 8 | 63 | 3 | 25 | 37 | 60 | 40 | 100 | 0.75 | with | YDEN0905... |

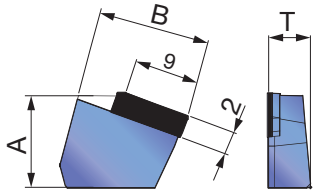
SPARE PARTS

| Designation | ① Wedge | ② Wedgte fixing screw | ③ Adjusting screw | ④ Helisert | Wrench | Wrench 1 |
|---|---|---|---|---|---|---|
| EDPD09063R | FW-304R-T | FDS-8SST | AJM5 | LM5-0.8X1DNS | T-27T | T-7F |

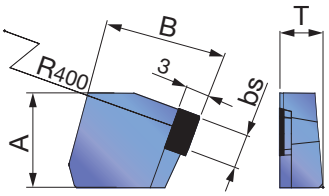



## INSERT

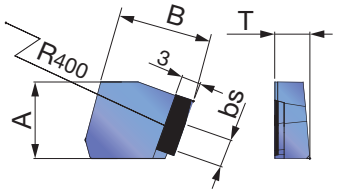
### YDEN0905PDFR-D




### YDEN0905PDFR-WD




### YDEN0905PDFR-BD




| | | |
|---|---|---|
| P | Steel | |
| M | Stainless | |
| K | Cast iron | |
| N | Non-ferrous | ★ |
| S | Superalloys | |
| H | Hard materials | |

★ : First choice
☆ : Second choice

| Designation | Max. ap | PCD DX140 | A | B | T | bs |
|---|---|---|---|---|---|---|
| YDEN0905PDFR-D | 8 | ● | 12.4 | 15.1 | 5.7 | - |
| YDEN0905PDFR-WD | - | ● | 12.4 | 15.2 | 5.7 | 4.5 |
| YDEN0905PDFR-BD | - | ● | 12.4 | 15.2 | 5.7 | 4.5 |

Note: As a principle, our company re-grinds these inserts.

●: Line-up

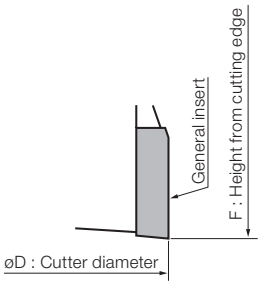
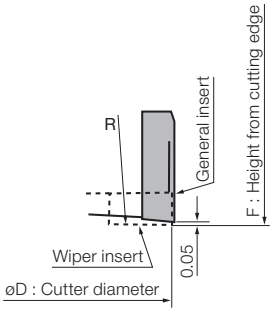
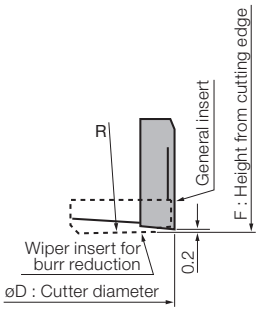
Package quantity = 1pc.

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Grade | Designation | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) |
|---|---|---|---|---|---|
| N | Aluminium alloy castings & die castings Si < 13% | DX140 | YDEN0905PDFR-D | 500 ~ 4000 | 0.05 ~ 0.2 |
| | Aluminium alloy castings & die castings Si ≥ 13% | DX140 | YDEN0905PDFR-D | 200 ~ 500 | 0.05 ~ 0.2 |
| | Rolled aluminium alloys | DX140 | YDEN0905PDFR-D | 500 ~ 4000 | 0.05 ~ 0.2 |
| | Copper alloys | DX140 | YDEN0905PDFR-D | 200 ~ 500 | 0.05 ~ 0.2 |

Notes:
(1) When requiring improved surface finish, use the wiper insert together with regular inserts YDEN0905PDFR-WD.
(2) When requiring reduced burr occurrence, use the deburring inserts together with regular inserts YDEN0905PDFR-BD.
(3) When using the cutter at speeds over 1500m/min, use an arbor or tool-holder balanced to within G16.
(4) Wet cutting, using a water soluble cutting fluid, is recommended.
(5) When the length-to-diameter overhang ratio of the tool (L/D) exceeds 3, reduce cutting speed and feed to 70 to 80% of the values given in the table.

## HOW TO PUT EACH INSERT TOGETHER

| | | | For general | Accuracy of machining surface priority | Burr reduction priority |
|---|---|---|---|---|---|
| Applicable insert | General insert | YDEN0905PDFR-D | ◎ | ◎ | ◎ |
| | Wiper insert | YDEN0905PDFR-WD | – | ◎ | – |
| | Wiper insert for burr reduction | YDEN0905PDFR-BD | – | – | ◎ |
| | Number of Inserts by type | | All general | 1 or 2 wiper inserts in cutter body | General insert : Burr wiper insert = 1 : 1 |
| Specification of insert setting | | |  |  |  |
| Accuracy of machining surface (roughness and undulation) | | | △ | ◎ | ○ |
| Burr of machining surface | | | △ | ○ | ◎ |

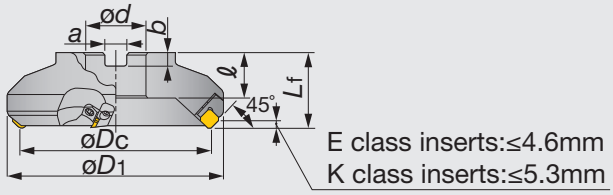
MEMO

## TME4400RI

45˚ face mills with wedge clamped high-posi square inserts

A.R. = +24˚, R.R. = -8˚ ~ -6˚





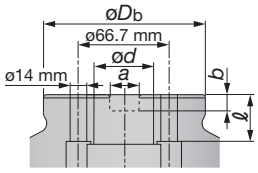

Right hand (R) shown.

| Designation | Max. ap | øDc | z | øD1 | Lf | ød | ℓ | a | b | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TME4403RI-E | 4 | 80 | 4 | 101.5 | 50 | 27 | 26 | 12.4 | 7 | 1.43 | SE*N1203 |
| TME4404RI-E | 4 | 100 | 5 | 120.2 | 63 | 32 | 32 | 14.4 | 8 | 2.74 | SE*N1203 |
| TME4405RI-E | 4 | 125 | 6 | 145.2 | 63 | 40 | 32 | 16.4 | 9 | 4.04 | SE*N1203 |
| TME4406RI-E | 4 | 160 | 8 | 181.2 | 63 | 40 | 29 | 16.4 | 9 | 5.82 | SE*N1203 |

Note: Cutting edge height (*Lf*) is for when SEEN1203AG*N type inserts are used.

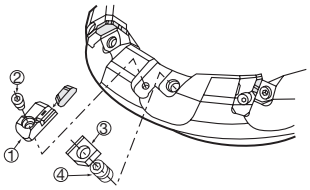
## Arbor type

### TME4406RI-E




### SPARE PARTS

| Designation | ① Locator | ④ Wedge fixing screw | ② Locator fixing screw | ③ Wedge | Wrench |
|---|---|---|---|---|---|
| TME4403RI-E | LE444R | FDS-8S | CM4X0.7X14 | WF444R | TP-4 |
| TME4404RI-E | LE444R | FDS-8S | CM4X0.7X14 | WF444R | TP-4 |
| TME4405RI-E | LE444R | FDS-8S | CM4X0.7X14 | WF444R | TP-4 |
| TME4406RI-E | LE446R | FDS-8S | CM4X0.7X14 | WF444R | TP-4 |

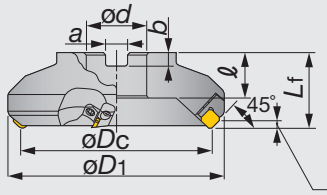


## TME4400RB

45˚ high dense face mills with wedg clamped high-posi square inserts

A.R. = +24˚, R.R. = -8˚ ~ -6˚






E class inserts:<4.6mm
K class inserts:<5.3mm

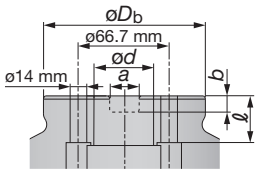
Right hand (R) shown.

| Designation | Max. ap | øDc | z | øD1 | Lf | ød | ℓ | a | b | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TME4463RB-E | 4 | 63 | 5 | 87.2 | 40 | 22 | 20 | 10.4 | 6.3 | 1.0 | SE*N1203 |
| TME4403RB-E | 4 | 80 | 6 | 101.5 | 50 | 27 | 26 | 12.4 | 7 | 1.43 | SE*N1203 |
| TME4404RB-E | 4 | 100 | 7 | 120.2 | 63 | 32 | 32 | 14.4 | 8 | 2.77 | SE*N1203 |
| TME4405RB-E | 4 | 125 | 9 | 145.2 | 63 | 40 | 32 | 16.4 | 9 | 4.06 | SE*N1203 |
| TME4406RB-E | 4 | 160 | 12 | 181.2 | 63 | 40 | 29 | 16.4 | 9 | 5.86 | SE*N1203 |

Note: Cutting edge height (*Lf*) is for when SEEN1203AG*N type inserts are used.

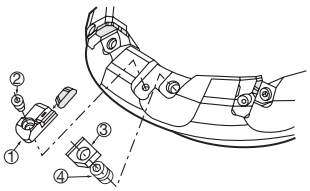
## Arbor type

### TME4406RB-E




### SPARE PARTS

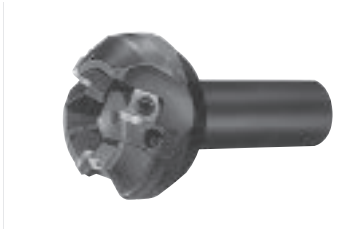
| Designation | ① Locator | ④ Wedge fixing screw | ② Locator fixing screw | ③ Wedge | Wrench |
|---|---|---|---|---|---|
| TME4463RB-E | LE444R | DS-8 | CM4X0.7X14 | WT402R | TP-4 |
| TME4403-06RB-E | LE446R | FDS-8S | CM4X0.7X14 | WF444R | TP-4 |

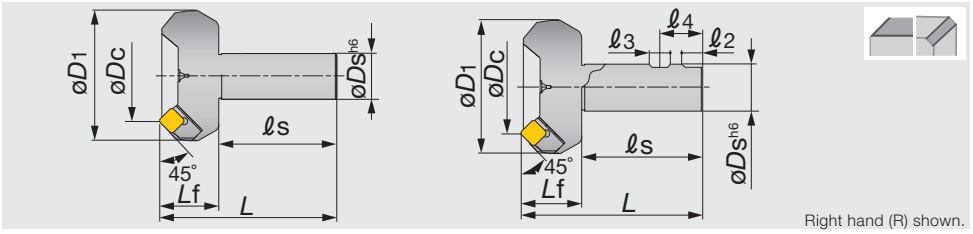


## EME4400

45° endmills with wedg clamped high-posi square inserts

A.R. = +24°, R.R. = -13° ~ -8°



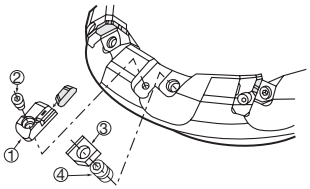



Right hand (R) shown.

| Designation | Max. *ap* | ø*D*c | z | ø*D*1 | ø*D*s | ℓs | *L*f | *L* | ℓ2 | ℓ3 | ℓ4 | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EME4450R | 4 | 50 | 3 | 73.4 | 32 | 80 | 40 | 120 | - | - | - | SE*N1203... |
| EME4463R | 4 | 63 | 4 | 87.2 | 32 | 80 | 40 | 120 | - | - | - | SE*N1203... |
| EME4403RI | 4 | 80 | 5 | 101.5 | 32 | 80 | 40 | 120 | 19 | 14 | 36 | SE*N1203... |
| EME4404RI | 4 | 100 | 5 | 120.2 | 32 | 80 | 40 | 120 | 19 | 14 | 36 | SE*N1203... |

### SPARE PARTS

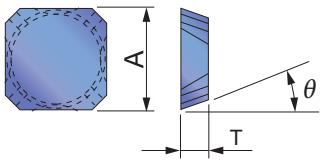
| Designation | ① Locator | ④ Wedge fixing screw | ② Locator fixing screw | ③ Wedge | Wrench |
|---|---|---|---|---|---|
| EME4400 | LE444R | FDS-8S | CM4X0.7X14 | WF444R | TP-4 |



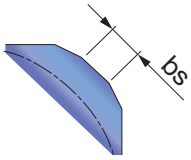
## INSERT

### SECN/SEEN/SEKN 1203

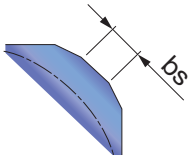
SE*N1203AG*N (-T)



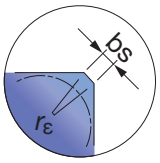

SEE/CN 1203AG*N



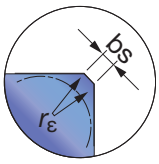

SEE/CN 1203AG*N



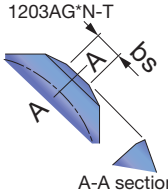

SEEN 1203AGTNCR




SEEN 1203AGTNCR-14

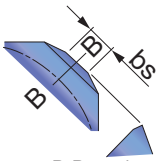



SEKN 1203AG*N-T




A-A section

SEEN 1203AG*N-T

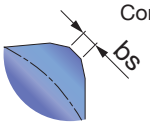



B-B section

### SEKR1203-MJ

SEKR1203AGSR-MJ
SEKR1203AGPN-MS

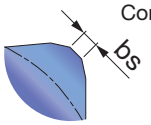
Corner detalls




### SEKR1203-MS

SEKR1203AGSR-MJ
SEKR1203AGPN-MS

Corner detalls




| | | AH120 | AH130 | AH140 | AH330 | GH330 | T1115 | T3130 | NS740 | UX30 | TH10 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ☆ | | | ★ | ☆ | | ★ | ★ | ☆ | |
| M | Stainless | | ★ | ☆ | ☆ | ☆ | | | | | |
| K | Cast iron | ★ | | | | | ★ | | | | |
| N | Non-ferrous | | | | | | | | | | ★ |
| S | Superalloys | ★ | ☆ | | | | | | | | |
| H | Hard materials | | | | | | | | | | |

★ : First choice
☆ : Second choice

| Designation | Max. ap | Coating | | | | | | | Cermet | Uncoated | | A | T | θ° | bs |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH130 | AH140 | AH330 | GH330 | T1115 | T3130 | NS740 | UX30 | TH10 | | | | |
| SECN1203AGFN | 4 | | | | | | | | | | ● | 12.7 | 3.18 | 20 | 2.4 |
| SEEN1203AGFN | 4 | | | | | | | | | | ● | 12.7 | 3.18 | 20 | 2.4 |
| SEEN1203AGTN | 4 | ● | ● | ● | | ● | ● | | ● | ● | | 12.7 | 3.18 | 20 | 2.4 |
| SEEN1203AGTN-T | 4 | | | | | | | ● | ● | ● | | 12.7 | 3.18 | 20 | 2.4 |
| SEEN1203AGTNCR | 4 | ● | ● | ● | ● | | | ● | | | | 12.7 | 3.18 | 20 | 1.6 |
| SEEN1203AGTNCR-14 | 4 | | | | | | | | ● | | | 12.7 | 3.18 | 20 | 1.4 |
| SEKN1203AGFN-T | 4 | | | | | | | | | | ● | 12.7 | 3.18 | 20 | 1.6 |
| SEKN1203AGTN | 4 | ● | ● | ● | ● | ● | | ● | ● | ● | | 12.7 | 3.18 | 20 | 1.6 |
| SEKN1203AGTN-T | 4 | | | | | ● | ● | ● | ● | ● | | 12.7 | 3.18 | 20 | 1.6 |
| SEKN1203AGTNCR | 4 | | | | | | | | ● | | | 12.7 | 3.18 | 20 | 1.6 |
| SEKR1203AGSR-MJ | 4 | ● | | | ● | ● | | ● | | | | 12.7 | 3.18 | 20 | 1.6 |
| SEKR1203AGPN-MS | 4 | | ● | ● | | | | | | | | 12.7 | 3.18 | 20 | 1.6 |

●: Line-up

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Grade | Roughing (Depth of cut: *ap* 1.5 ~ 4 mm) | | Finishing (Depth of cut: *ap* 0.3 ~ 0.7 mm) | |
|---|---|---|---|---|---|---|
| | | | Cutting speed *vc* (m/min) | Feed per tooth *fz* (mm/t) | Cutting speed *vc* (m/min) | Feed per tooth *fz* (mm/t) |
| P | Mild steels<br>Unhardened steels<br>< 180 HB | NS740 | 150 ~ 250 | 0.1 ~ 0.2 | 150 ~ 250 | 0.1 ~ 0.25 |
| | | AH330 | 150 ~ 400 | 0.1 ~ 0.25 | 150 ~ 400 | 0.1 ~ 0.28 |
| | | AH120 | 150 ~ 250 | 0.1 ~ 0.25 | 150 ~ 250 | 0.1 ~ 0.28 |
| | | T3130 | 150 ~ 300 | 0.1 ~ 0.28 | 180 ~ 300 | 0.1 ~ 0.3 |
| | | AH130 · AH140 | 100 ~ 180 | 0.1 ~ 0.28 | 130 ~ 200 | 0.1 ~ 0.3 |
| | Carbon steels<br>Alloy steels<br>< 300 HB | T3130 | 150 ~ 280 | 0.1 ~ 0.25 | 180 ~ 280 | 0.1 ~ 0.28 |
| | | NS740 | 100 ~ 180 | 0.1 ~ 0.18 | 150 ~ 200 | 0.1 ~ 0.23 |
| | | AH330 | 100 ~ 320 | 0.1 ~ 0.23 | 150 ~ 320 | 0.1 ~ 0.25 |
| | | AH120 | 100 ~ 200 | 0.1 ~ 0.23 | 150 ~ 200 | 0.1 ~ 0.25 |
| | Die steels<br>< 30 HRC | AH120 · T3130 | 100 ~ 150 | 0.1 ~ 0.15 | 100 ~ 150 | 0.1 ~ 0.2 |
| | | AH330 | 100 ~ 250 | 0.1 ~ 0.15 | 100 ~ 250 | 0.1 ~ 0.2 |
| M | Stainless steels<br>< 250 HB | AH130 · AH140 | 80 ~ 180 | 0.15 ~ 0.25 | 100 ~ 200 | 0.15 ~ 0.28 |
| | | AH120 · GH330 | 150 ~ 230 | 0.15 ~ 0.23 | 200 ~ 250 | 0.15 ~ 0.25 |
| K | Cast irons<br>Ductile cast irons | T1115 | 100 ~ 200 | 0.1 ~ 0.2 | 100 ~ 200 | 0.1 ~ 0.25 |
| | | AH120 | 100 ~ 200 | 0.1 ~ 0.2 | 100 ~ 200 | 0.1 ~ 0.25 |
| N | Aluminium alloys Si < 13% | TH10 | 200 ~ 1000 | 0.05 ~ 0.2 | 350 ~ 1000 | 0.1 ~ 0.3 |
| | Copper alloy | TH10 | 200 ~ 500 | 0.1 ~ 0.2 | 200 ~ 500 | 0.1 ~ 0.25 |

Notes:
- Dry cutting is recommended for all materials except for aluminium alloys.
- When wet machining mild steels, carbon steels and alloy steels, use T3130 at lower cutting conditions.
- No. of revolutions ($min^{-1}$) = Cutting speed × 1000 ÷ 3.14 ÷ Cutter diameter
- Table feed (mm/min) = No. of revolutions × Feed per tooth × No. of inserts

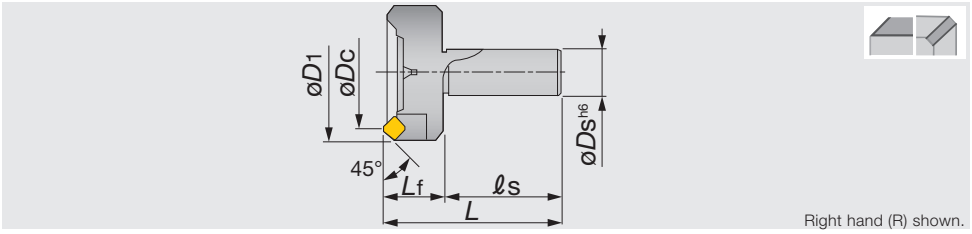
MEMO

## EMD4400RI

45° endmills with wedge clamped square inserts

A.R. = +15°, R.R. = -3°



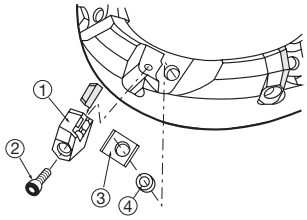



Right hand (R) shown.

| Designation | Max. ap | øDc | z | øD1 | øDs | ℓs | Lf | L | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| EMD4403RI-S32 | 4 | 80 | 4 | 95 | 32 | 80 | 40 | 120 | 2 | SD*N42.../SD*R1203.../ WDCN42ZFR-DIA |

### SPARE PARTS

| Designation | ① Locator | ④ Wedge fixing screw | ② Locator fixing screw | ③ Wedge | Wrench |
|---|---|---|---|---|---|
| EMD4403RI-S32 | LD440R | FDS-8S | CM4X0.7X14 | WP440R | TP-4 |

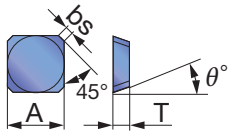



Face Milling

# INSERT

## SDCN/SDEN/SDKN 42Z

General inserts
SD*N42Z*N




Corner details
SDKN42ZTN16




SD*N42ZTN20

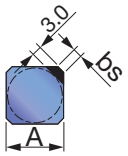



SDKN42ZTNCR
SDEN42ZTNCR



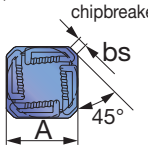

## SDCN42ZFN-DIA

SDCN42ZFN-DIA

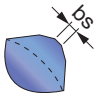



## SDKR42Z-MJ

SDKR42ZSR-MJ
(With 3-dimensional chipbreaker)

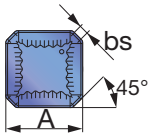



Corner details

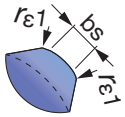



## SDMR/SDKR 1203-MJ

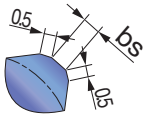
SD*R1203AETN-MJ
(With 3-dimensional chipbreaker)




Corner details
SDMR1203AETN-MJ

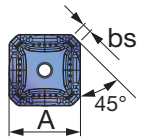



SDKR1203AETN-MJ

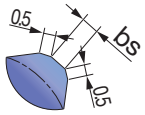



## SDKR42Z-MS

SDKR42ZPN-MS

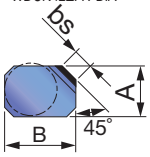



Corner details




## WDCN42ZFR-DIA

Wiper inserts
WDCN42ZFR-DIA




| | | AH120 | AH130 | AH140 | AH330 | GH330 | T1115 | T3130 | NS740 | N308 | UX30 | TH10 | DX140 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ★ | | | ★ | ☆ | | ★ | ★ | ☆ | ☆ | | |
| M | Stainless | | ★ | ☆ | | | | | | | | | |
| K | Cast iron | ★ | | | | | ★ | | | | | | |
| N | Non-ferrous | | | | | | | | | | | ★ | ★ |
| S | Superalloys | ★ | ☆ | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | |

★ : First choice
☆ : Second choice

| Designation | Max. ap | Coating | | | | | | | Cermet | | Uncoated | | PCD | A | B | T | θ° | bs |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH130 | AH140 | AH330 | GH330 | T1115 | T3130 | NS740 | N308 | UX30 | TH10 | DX140 | | | | | |
| SDCN42ZFN | 4 | | | | | | | | | | | ● | | 12.7 | - | 3.18 | 15 | 1.2 |
| SDCN42ZTN | 4 | | | | | | | | ● | ● | ● | | | 12.7 | - | 3.18 | 15 | 1.2 |
| SDCN42ZTN20 | 4 | | | | | | | | ● | | | | | 12.7 | - | 3.18 | 15 | 2 |
| SDEN42ZFN | 4 | | | | | | | | | | | ● | | 12.7 | - | 3.18 | 15 | 1.2 |
| SDEN42ZTN | 4 | ● | | ● | | ● | ● | | ● | ● | ● | | | 12.7 | - | 3.18 | 15 | 1.2 |
| SDEN42ZTNCR | 4 | ● | | ● | ● | | | | ● | | | | | 12.7 | - | 3.18 | 15 | 1.6 |
| SDEN42ZTN20 | 4 | | | | | | | ● | | | | | | 12.7 | - | 3.18 | 15 | 2 |
| SDKN42ZFN | 4 | | | | | | | | | | | ● | | 12.7 | - | 3.18 | 15 | 1.2 |
| SDKN42ZTN | 4 | ● | ● | ● | ● | ● | ● | | ● | ● | ● | | | 12.7 | - | 3.18 | 15 | 1.2 |
| SDKN42ZTNCR | 4 | | | | | | | | ● | | | | | 12.7 | - | 3.18 | 15 | 1.6 |
| SDKN42ZTN16 | 4 | | | | | | | ● | | | | | | 12.7 | - | 3.18 | 15 | 1.6 |
| SDCN42ZFN-DIA | 2 | | | | | | | | | | | | ● | 12.7 | - | 3.18 | 15 | 1.2 |
| SDKR42ZSR-MJ | 4 | ● | | | ● | ● | | ● | | | | | | 12.7 | - | 3.18 | 15 | 1.6 |
| SDMR1203AETN-MJ | 4 | | | | | | | | ● | | | | | 12.7 | - | 3.18 | 15 | 1.6 |
| SDKR1203AETN-MJ | 4 | | | | | | | | ● | | | | | 12.7 | - | 3.18 | 15 | 1.6 |
| SDKR42ZPN-MS | 4 | | ● | ● | | | | | | | | | | 12.7 | - | 3.18 | 15 | 1.6 |
| WDCN42ZFR-DIA | 0.5 | | | | | | | | | | | | ● | 12.2 | 15.64 | 3.18 | 15 | 4.9 |

●: Line-up
DX140 : Package quantity = 1pc.

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Grade | Roughing (Depth of cut: *ap* 1.5 ~ 4 mm) | | Finishing (Depth of cut: *ap* 0.3 ~ 0.7 mm) | |
|---|---|---|---|---|---|---|
| | | | Cutting speed *vc* (m/min) | Feed per tooth *fz* (mm/t) | Cutting speed *vc* (m/min) | Feed per tooth *fz* (mm/t) |
| P | Mild steels<br>Unhardened steels<br>< 180 HB | NS740 | 150 ~ 250 | 0.1 ~ 0.2 | 150 ~ 250 | 0.1 ~ 0.25 |
| | | AH330 | 150 ~ 400 | 0.1 ~ 0.25 | 150 ~ 400 | 0.1 ~ 0.28 |
| | | AH120 | 150 ~ 250 | 0.1 ~ 0.25 | 150 ~ 250 | 0.1 ~ 0.28 |
| | | T3130 | 150 ~ 300 | 0.1 ~ 0.28 | 180 ~ 300 | 0.1 ~ 0.3 |
| | | AH130 · AH140 | 100 ~ 180 | 0.1 ~ 0.28 | 130 ~ 200 | 0.1 ~ 0.3 |
| | Carbon steels<br>Alloy steels<br>< 300 HB | T3130 | 150 ~ 280 | 0.1 ~ 0.25 | 180 ~ 280 | 0.1 ~ 0.28 |
| | | NS740 · N308 | 100 ~ 180 | 0.1 ~ 0.18 | 150 ~ 200 | 0.1 ~ 0.23 |
| | | AH330 | 100 ~ 320 | 0.1 ~ 0.23 | 150 ~ 320 | 0.1 ~ 0.25 |
| | | AH120 | 100 ~ 200 | 0.1 ~ 0.23 | 150 ~ 200 | 0.1 ~ 0.25 |
| | | UX30 | 80 ~ 130 | 0.1 ~ 0.25 | 100 ~ 150 | 0.1 ~ 0.28 |
| | Die steels<br>< 30 HRC | AH120 · T3130 | 100 ~ 150 | 0.1 ~ 0.15 | 100 ~ 150 | 0.1 ~ 0.2 |
| | | AH330 | 100 ~ 250 | 0.1 ~ 0.15 | 100 ~ 250 | 0.1 ~ 0.2 |
| M | Stainless steels<br>< 250 HB | AH130 · AH140 | 80 ~ 180 | 0.15 ~ 0.25 | 100 ~ 200 | 0.15 ~ 0.28 |
| | | AH120 · GH330 | 150 ~ 230 | 0.15 ~ 0.23 | 200 ~ 250 | 0.15 ~ 0.25 |
| K | Cast irons<br>Ductile cast irons | T1115 | 100 ~ 200 | 0.1 ~ 0.2 | 100 ~ 200 | 0.1 ~ 0.25 |
| | | AH120 | 100 ~ 200 | 0.1 ~ 0.2 | 100 ~ 200 | 0.1 ~ 0.25 |
| N | Aluminium alloys<br>Si < 13% | TH10 | 200 ~ 1000 | 0.05 ~ 0.2 | 350 ~ 1000 | 0.1 ~ 0.3 |
| | | DX140 | 200 ~ 1000 | 0.05 ~ 0.18 | 350 ~ 1000 | 0.1 ~ 0.2 |
| | Copper alloy | TH10 | 200 ~ 500 | 0.1 ~ 0.2 | 200 ~ 500 | 0.1 ~ 0.25 |

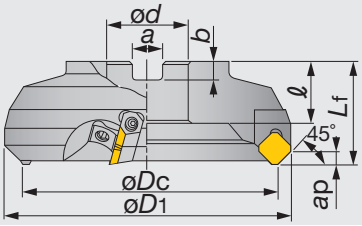
Note: • Dry cutting is recommended for all materials except for aluminium alloys.
• Maximum depth of cut for DX140 SDCN42ZFN-DIA is 2 mm.
• When wet machining mild steels, carbon steels and alloy steels, use T3130 at lower cutting conditions.

## TMD5400RI

45° face mills with wedge clamped square inserts

A.R. = +15°, R.R. = -3°



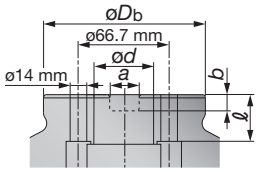



Right hand (R) shown.

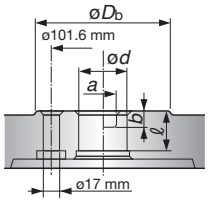
| Designation | Max. ap | øDc | z | øD1 | Lf | ød | ℓ | a | b | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TMD5404RI-E | 6 | 100 | 4 | 118 | 63 | 32 | 32 | 14.4 | 8 | 2.5 | SD*N53Z... |
| TMD5405RI-E | 6 | 125 | 6 | 142 | 63 | 40 | 32 | 16.4 | 9 | 3.7 | SD*N53Z... |
| TMD5406RI-E | 6 | 160 | 6 | 176 | 63 | 40 | 29 | 16.4 | 9 | 5.8 | SD*N53Z... |
| TMD5408RI-E | 6 | 200 | 8 | 216 | 63 | 60 | 38 | 25.7 | 14 | 9 | SD*N53Z... |
| TMD5410RI-E | 6 | 250 | 10 | 265 | 63 | 60 | 38 | 25.7 | 14 | 16.3 | SD*N53Z... |
| TMD5412RI-E | 6 | 315 | 12 | 330 | 63 | 60 | 38 | 25.7 | 14 | 25.2 | SD*N53Z... |

## Arbor type

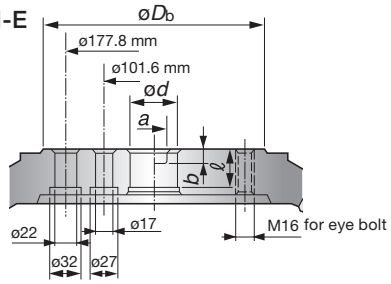
**TMD5406RI-E**




**TMD5408/10...**

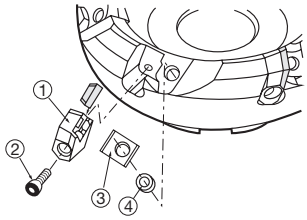



**TMD5412RI-E**




### SPARE PARTS

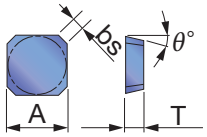
| Designation | ① Locator | ④ Wedge fixing screw | ② Locator fixing screw | ③ Wedge | Wrench |
|---|---|---|---|---|---|
| TMD54**RI* | LD540R | FDS-8S | CM4X0.7X20 | WF500R | TP-4 |



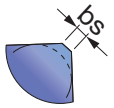
# INSERT

## SDCN/SDEN 53Z

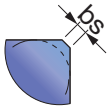
SD*N53Z*N



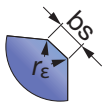

SDEN53ZTN20
Corner details



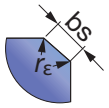

SDKN53ZTN16
Corner details




SDEN53ZTNCR
Corner details

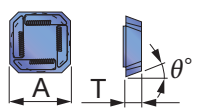


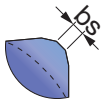

SDKN53ZTNCR
Corner details




## SDKR53-MJ

SDKR53ZSR-MJ
(With 3-dimensionalchipbreaker)




| | | AH120 | AH130 | AH140 | GH330 | T3130 | NS740 | N308 | UX30 | TH10 |
|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ☆ | | | ☆ | ★ | ★ | ☆ | ☆ | |
| M | Stainless | | ★ | ☆ | | | | | | |
| K | Cast iron | ★ | | | | | | | | |
| N | Non-ferrous | | | | | | | | | ★ |
| S | Superalloys | ★ | ☆ | | | | | | | |
| H | Hard materials | | | | | | | | | |

★ : First choice
☆ : Second choice

| Designation | Max. ap | A | T | θ° | bs |
|---|---|---|---|---|---|
| SDCN53ZTN | 6 | 15.875 | 4.76 | 15 | 1.2 |
| SDEN53ZFN | 6 | 15.875 | 4.76 | 15 | 1.2 |
| SDEN53ZTN | 6 | 15.875 | 4.76 | 15 | 1.2 |
| SDEN53ZTNCR | 6 | 15.875 | 4.76 | 15 | 1.4 |
| SDEN53ZTN20 | 6 | 15.875 | 4.76 | 15 | 2 |
| SDKN53ZFN | 6 | 15.875 | 4.76 | 15 | 1.2 |
| SDKN53ZTN | 6 | 15.875 | 4.76 | 15 | 1.2 |
| SDKN53ZTNCR | 6 | 15.875 | 4.76 | 15 | 1.6 |
| SDKN53ZTN16 | 6 | 15.875 | 4.76 | 15 | 1.6 |
| SDKR53ZSR-MJ | 6 | 15.875 | 4.76 | 15 | 2 |

●: Line-up



# STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Grade | Roughing (Depth of cut: ap 1.5 ~ 6 mm) | | Finishing (Depth of cut: ap 0.3 ~ 0.7 mm) | |
|---|---|---|---|---|---|---|
| | | | Cutting speed vc (m/min) | Feed per tooth fz (mm/t) | Cutting speed vc (m/min) | Feed per tooth fz (mm/t) |
| P | Mild steels Unhardened steels < 180 HB | NS740 | 150 ~ 250 | 0.1 ~ 0.25 | 150 ~ 250 | 0.1 ~ 0.3 |
| | | AH120 | 150 ~ 250 | 0.1 ~ 0.35 | 150 ~ 250 | 0.1 ~ 0.35 |
| | | T3130 | 150 ~ 300 | 0.1 ~ 0.35 | 180 ~ 300 | 0.1 ~ 0.35 |
| | | AH130 | 100 ~ 180 | 0.1 ~ 0.35 | 130 ~ 200 | 0.1 ~ 0.35 |
| | Carbon steels Alloy steels < 300 HB | T3130 | 150 ~ 280 | 0.1 ~ 0.35 | 180 ~ 280 | 0.1 ~ 0.35 |
| | | NS740 | 100 ~ 180 | 0.1 ~ 0.25 | 150 ~ 200 | 0.1 ~ 0.3 |
| | | AH120 | 100 ~ 200 | 0.1 ~ 0.3 | 150 ~ 200 | 0.1 ~ 0.35 |
| | Die steels < 30 HRC | T3130 · AH120 | 100 ~ 150 | 0.1 ~ 0.2 | 100 ~ 150 | 0.1 ~ 0.2 |
| M | Stainless steels < 250 HB | AH130 · AH140 | 80 ~ 180 | 0.15 ~ 0.3 | 100 ~ 200 | 0.15 ~ 0.33 |
| | | AH120 · GH330 | 150 ~ 230 | 0.15 ~ 0.3 | 200 ~ 250 | 0.15 ~ 0.3 |
| K | Cast irons, Ductile cast irons | AH120 | 100 ~ 200 | 0.1 ~ 0.3 | 100 ~ 200 | 0.1 ~ 0.3 |
| N | Aluminium alloys Si < 13% | TH10 | 200 ~ 1000 | 0.05 ~ 0.3 | 350 ~ 1000 | 0.1 ~ 0.3 |
| | Copper alloys | TH10 | 200 ~ 500 | 0.1 ~ 0.2 | 200 ~ 500 | 0.1 ~ 0.25 |

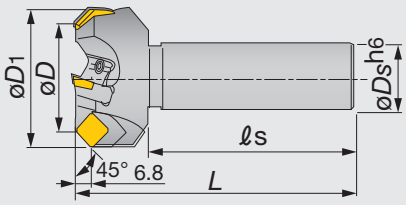
Notes: • Dry cutting is recommended for all materials except for aluminium alloys.
• When wet machining mild steels, carbon steels and alloy steels, use T3130 at lower cutting conditions.

## EGD4400

45° endmills with wedge clamped square inserts

A.R. = +15°, R.R. = -3°

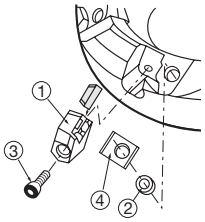





| Designation | Max. ap | øDc | z | øD1 | øDs | ℓs | Lf | L | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| EGD4450R | 4 | 50 | 4 | 67 | 32 | 80 | 35 | 115 | 1.1 | SD*N42.../SD*R1203.../ WDCN42ZFR-DIA |
| EGD4463R | 4 | 63 | 4 | 79 | 32 | 80 | 35 | 115 | 1.4 | SD*N42.../SD*R1203.../ WDCN42ZFR-DIA |

### SPARE PARTS

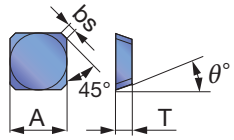
| Designation | ① Locator | ② Wedge fixing screw | ③ Screw | ④ Wedge | Wrench |
|---|---|---|---|---|---|
| EGD4400 | LD442R | DS-8 | BM3X0.5X6 | WP193TR | TP-4 |




Face Milling

## SDCN/SDEN/SDKN 42Z

General inserts
SD*N42Z*N




Corner details
SDKN42ZTN16




SD*N42ZTN20

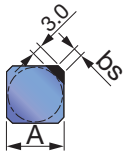



SDKN42ZTNCR
SDEN42ZTNCR



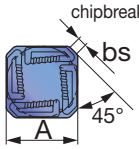

## SDCN42ZFN-DIA

SDCN42ZFN-DIA




## SDKR42Z-MJ

SDKR42ZSR-MJ
(With 3-dimensional chipbreaker)

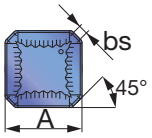



Corner details

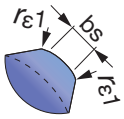



## SDMR/SDKR 1203-MJ

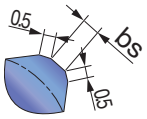
SD*R1203AETN-MJ
(With 3-dimensional chipbreaker)




Corner details
SDMR1203AETN-MJ

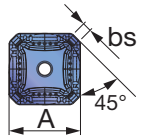



SDKR1203AETN-MJ

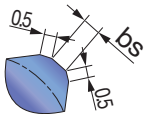



## SDKR42Z-MS

SDKR42ZPN-MS

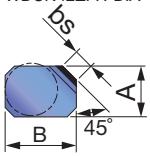



Corner details




## WDCN42ZFR-DIA

Wiper inserts
WDCN42ZFR-DIA






| | | AH120 | AH130 | AH140 | AH330 | GH330 | T1115 | T3130 | NS740 | N308 | UX30 | TH10 | DX140 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ★ | | | ★ | ☆ | | ★ | ★ | ☆ | | ☆ | |
| M | Stainless | | ★ | ☆ | | | | | | | | | |
| K | Cast iron | ★ | | | | | ★ | | | | | | |
| N | Non-ferrous | | | | | | | | | | | ★ | ★ |
| S | Superalloys | ★ | ☆ | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | |

★ : First choice
☆ : Second choice

| Designation | Max. ap | Coating | | | | | | | Cermet | | Uncoated | | PCD | A | B | T | θ° | bs |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH130 | AH140 | AH330 | GH330 | T1115 | T3130 | NS740 | N308 | UX30 | TH10 | DX140 | | | | | |
| SDCN42ZFN | 4 | | | | | | | | | | | ● | | 12.7 | - | 3.18 | 15 | 1.2 |
| SDCN42ZTN | 4 | | | | | | | | ● | ● | ● | | | 12.7 | - | 3.18 | 15 | 1.2 |
| SDCN42ZTN20 | 4 | | | | | | | | ● | | | | | 12.7 | - | 3.18 | 15 | 2 |
| SDEN42ZFN | 4 | | | | | | | | | | | ● | | 12.7 | - | 3.18 | 15 | 1.2 |
| SDEN42ZTN | 4 | ● | | ● | | ● | ● | | ● | ● | ● | | | 12.7 | - | 3.18 | 15 | 1.2 |
| SDEN42ZTNCR | 4 | ● | | ● | ● | | | | ● | | | | | 12.7 | - | 3.18 | 15 | 1.6 |
| SDEN42ZTN20 | 4 | | | | | | | ● | | | | | | 12.7 | - | 3.18 | 15 | 2 |
| SDKN42ZFN | 4 | | | | | | | | | | | ● | | 12.7 | - | 3.18 | 15 | 1.2 |
| SDKN42ZTN | 4 | ● | ● | ● | ● | ● | ● | | ● | ● | ● | | | 12.7 | - | 3.18 | 15 | 1.2 |
| SDKN42ZTNCR | 4 | | | | | | | | ● | | | | | 12.7 | - | 3.18 | 15 | 1.6 |
| SDKN42ZTN16 | 4 | | | | | | | ● | | | | | | 12.7 | - | 3.18 | 15 | 1.6 |
| SDCN42ZFN-DIA | 2 | | | | | | | | | | | | ● | 12.7 | - | 3.18 | 15 | 1.2 |
| SDKR42ZSR-MJ | 4 | ● | | | ● | ● | | ● | | | | | | 12.7 | - | 3.18 | 15 | 1.6 |
| SDMR1203AETN-MJ | 4 | | | | | | | | ● | | | | | 12.7 | - | 3.18 | 15 | 1.6 |
| SDKR1203AETN-MJ | 4 | | | | | | | | ● | | | | | 12.7 | - | 3.18 | 15 | 1.6 |
| SDKR42ZPN-MS | 4 | | ● | ● | | | | | | | | | | 12.7 | - | 3.18 | 15 | 1.6 |
| WDCN42ZFR-DIA | 0.5 | | | | | | | | | | | | ● | 12.2 | 15.64 | 3.18 | 15 | 4.9 |

●: Line-up
DX140 : Package quantity = 1pc.

## STANDARD CUTTING CONDITIONS

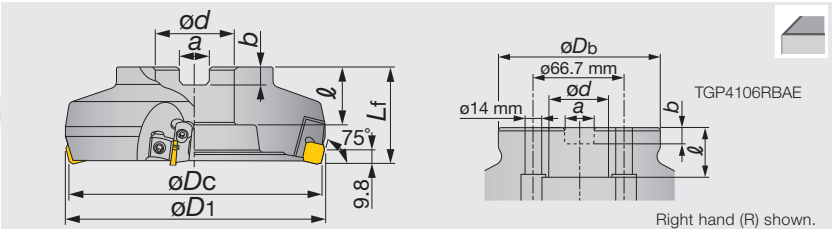
| ISO | Workpiece material | Grade | Roughing (Depth of cut: *ap* 1.5 ~ 4 mm) | | Finishing (Depth of cut: *ap* 0.3 ~ 0.7 mm) | |
|---|---|---|---|---|---|---|
| | | | Cutting speed *vc* (m/min) | Feed per tooth *fz* (mm/t) | Cutting speed *vc* (m/min) | Feed per tooth *fz* (mm/t) |
| P | Mild steels<br>Unhardened steels<br>< 180 HB | NS740 | 150 ~ 300 | 0.1 ~ 0.2 | 150 ~ 300 | 0.1 ~ 0.25 |
| | | AH330 | 150 ~ 400 | 0.1 ~ 0.25 | 150 ~ 400 | 0.1 ~ 0.28 |
| | | AH120 | 150 ~ 250 | 0.1 ~ 0.25 | 150 ~ 250 | 0.1 ~ 0.28 |
| | | T3130 | 150 ~ 280 | 0.1 ~ 0.28 | 180 ~ 300 | 0.1 ~ 0.3 |
| | | AH130 · AH140 | 100 ~ 180 | 0.1 ~ 0.28 | 130 ~ 200 | 0.1 ~ 0.3 |
| | Carbon steels<br>Alloy steels<br>< 300 HB | T3130 | 150 ~ 230 | 0.1 ~ 0.25 | 180 ~ 280 | 0.1 ~ 0.28 |
| | | NS740 | 100 ~ 230 | 0.1 ~ 0.18 | 150 ~ 230 | 0.1 ~ 0.23 |
| | | AH330 | 100 ~ 320 | 0.1 ~ 0.23 | 150 ~ 320 | 0.1 ~ 0.25 |
| | | AH120 | 100 ~ 200 | 0.1 ~ 0.23 | 150 ~ 200 | 0.1 ~ 0.25 |
| | Die steels<br>< 30 HRC | AH120 | 100 ~ 150 | 0.1 ~ 0.15 | 100 ~ 150 | 0.1 ~ 0.2 |
| | | AH330 | 100 ~ 250 | 0.1 ~ 0.15 | 100 ~ 250 | 0.1 ~ 0.2 |
| M | Stainless steels<br>< 250 HB | AH130 · AH140 | 80 ~ 180 | 0.15 ~ 0.25 | 100 ~ 200 | 0.15 ~ 0.28 |
| | | AH120 | 150 ~ 230 | 0.15 ~ 0.23 | 200 ~ 250 | 0.15 ~ 0.25 |
| K | Cast irons<br>Ductile cast irons | T1115 | 100 ~ 200 | 0.1 ~ 0.2 | 100 ~ 200 | 0.1 ~ 0.25 |
| | | AH120 | 100 ~ 200 | 0.1 ~ 0.2 | 100 ~ 200 | 0.1 ~ 0.25 |
| N | Aluminium alloys<br>Si < 13% | TH10 | 200 ~ 1000 | 0.05 ~ 0.2 | 350 ~ 1000 | 0.1 ~ 0.3 |
| | | DX140 | 200 ~ 1000 | 0.05 ~ 0.18 | 350 ~ 1000 | 0.1 ~ 0.2 |
| | Copper alloy | TH10 | 200 ~ 500 | 0.1 ~ 0.2 | 200 ~ 500 | 0.1 ~ 0.25 |

Note: • Dry cutting is recommended for all materials except for aluminium alloys.
• Maximum depth of cut for DX140 SDCN42ZFN-DIA is 2 mm.
• When wet machining mild steels, carbon steels and alloy steels, use T3130 at lower cutting conditions.
• No. of revolutions ($min^{-1}$) = Cutting speed 3 1000 ÷ 3.14 ÷ Cutter diameter
• Table feed (mm/min) = No. of revolutions 3 Feed per tooth 3 No. of inserts

## TGP4100RBAE

75° face mills with wedge clamped square inserts

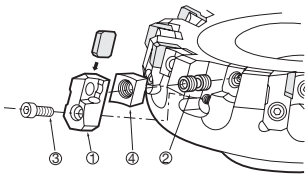





| Designation | Max. ap | øDc | z | øD1 | Lf | ød | ℓ | a | b | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TGP4104RBAE | 7 | 100 | 8 | 108 | 63 | 32 | 25 | 14.4 | 8 | 2.4 | SP*N42/WPAN42... |
| TGP4105RBAE | 7 | 125 | 10 | 132 | 63 | 40 | 32 | 16.4 | 9 | 3.6 | SP*N42/WPAN42... |
| TGP4106RBAE | 7 | 160 | 12 | 167 | 63 | 40 | 29 | 16.4 | 9 | 5.8 | SP*N42/WPAN42... |

### SPARE PARTS

| Designation | ①Locator | ②Wedge fixing screw | ③Locator fixing screw | ④Wedge | Wrench |
|---|---|---|---|---|---|
| TGP41**RBAE | LP413R | FDS-8S | CM4X0.7X14 | WF310R | TP-4 |




Face Milling

## INSERT

### SPCN/SPEN/SPKN 42S

SP*N42S*R/L

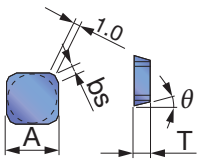



Fig.1

SPEN423*N
Corner details

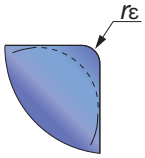



Fig.2

SPKR42SSR-MJ
(With 3-dimensional chipbreaker)

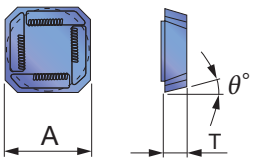
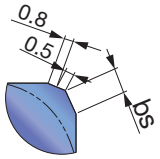



Fig.3

Corner details




WPAN42SFRS
Wiper insert one-corner type

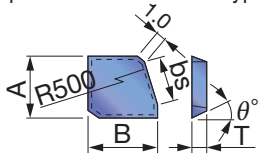



Fig.4

WPAN42SFR
Two-corner type

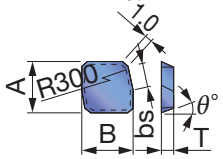



Fig.5

Right hand (R) shown.

| | | Coating | | | | | Cermet | | Ceramic | Uncoated | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Designation | rε | Max. ap | AH120 | AH140 | GH330 | T1115 | T3130 | NS740 | N308 | FX105 | UX30 | TH10 | A | B | T | θ° | bs | Fig. |
| P | SPCN42STR | 0 | 7 | | | | | | ● | ● | | ● | | 12.7 | - | 3.18 | 11 | 1.4 | 1 |
| P | SPCN42SFR | 0 | 7 | | | | | | | | | | ● | 12.7 | - | 3.18 | 11 | 1.4 | 1 |
| P | SPEN42STR | 0 | 7 | | | | | | ● | | | | | 12.7 | - | 3.18 | 11 | 1.4 | 1 |
| P | SPKN42STR | 0 | 7 | ● | ● | ● | ● | ● | ● | ● | ●* | ● | | 12.7 | - | 3.18 | 11 | 1.4 | 1 |
| P | SPKN42STL | 0 | 7 | | | | | | ● | | | ● | | 12.7 | - | 3.18 | 11 | 1.4 | 1 |
| P | SPKN42SFR | 0 | 7 | | | | | | | | | | ● | 12.7 | - | 3.18 | 11 | 1.4 | 1 |
| P | SPKN42SFL | 0 | 7 | | | | | | | | | | ● | 12.7 | - | 3.18 | 11 | 1.4 | 1 |
| P | SPKR42SSR-MJ | 0 | 7 | | | ● | ● | ● | | | | | | 12.7 | - | 3.18 | 11 | 0 | 3 |
| P | WPAN42SFR | 0 | - | | | | | | | ● | | | ● | 12.4 | 14.9 | 3.18 | 11 | 5.2 | 5 |
| P | WPAN42SFRS | 0 | - | | | | | | | | | | ● | 12.4 | 13.8 | 3.18 | 11 | 9.6 | 4 |
| P | SPGN120312TN | 1.2 | 7 | | | | | | | | ●* | | | 12.7 | - | 3.18 | 11 | - | 2 |
| P | SPEN423TN | 1.2 | 7 | | | | | ● | ● | | | ● | | 12.7 | - | 3.18 | 11 | - | 2 |
| P | SPEN423FN | 1.2 | 7 | | | | | | | | | | ● | 12.7 | - | 3.18 | 11 | - | 2 |

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ★ | | ☆ | | ★ | | ★ | ☆ | | | ☆ | | | | | | | | |
| M | Stainless | | ★ | | | | | | | | | | | | | | | | | |
| K | Cast iron | ★ | | | ★ | | | | | | ★ | | | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | ★ | | | | | | | |
| S | Superalloys | ★ | | | | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | |

★ : First choice
☆ : Second choice

Note: * marked inserts should not be used with wiper inserts.

●: Line-up

## STANDARD CUTTING CONDITIONS

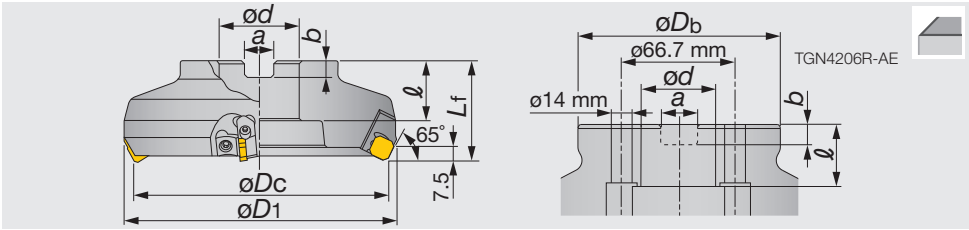
| ISO | Workpiece material | Grade | Roughing (Depth of cut: *ap* 1.5 ~ 4 mm) | | Finishing (Depth of cut: *ap* 0.3 ~ 0.7 mm) | |
|---|---|---|---|---|---|---|
| | | | Cutting speed *vc* (m/min) | Feed per tooth *fz* (mm/t) | Cutting speed *vc* (m/min) | Feed per tooth *fz* (mm/t) |
| K | Cast irons<br>Ductile cast irons | T1115 | 100 ~ 200 | 0.1 ~ 0.2 | 100 ~ 200 | 0.1 ~ 0.23 |
| | | TH10 · UX30 | 80 ~ 130 | 0.1 ~ 0.2 | 80 ~ 130 | 0.1 ~ 0.23 |
| | | FX105 | 200 ~ 500 | 0.1 ~ 0.2 | 200 ~ 600 | 0.1 ~ 0.3 |
| P | Mild steels<br>Unhardened steels<br>< 180 HB | NS740 · N308 | 150 ~ 250 | 0.1 ~ 0.18 | 150 ~ 250 | 0.1 ~ 0.23 |
| | | AH120 · GH330 | 150 ~ 250 | 0.1 ~ 0.23 | 150 ~ 250 | 0.1 ~ 0.25 |
| | | T3130 | 150 ~ 300 | 0.1 ~ 0.25 | 180 ~ 300 | 0.1 ~ 0.28 |
| | | UX30 | 100 ~ 180 | 0.1 ~ 0.25 | 130 ~ 200 | 0.1 ~ 0.28 |
| | Carbon steels<br>Alloy steels<br>< 300 HB | T3130 | 150 ~ 280 | 0.1 ~ 0.23 | 180 ~ 280 | 0.1 ~ 0.25 |
| | | NS740 · N308 | 100 ~ 180 | 0.1 ~ 0.18 | 150 ~ 200 | 0.1 ~ 0.23 |
| | | AH330 · AH120 | 100 ~ 200 | 0.1 ~ 0.2 | 150 ~ 200 | 0.1 ~ 0.23 |
| | | UX30 | 80 ~ 130 | 0.1 ~ 0.23 | 100 ~ 150 | 0.1 ~ 0.25 |
| | Carbon steels<br>Alloy steels<br>> 300 HB | T3130 · GH330 | 150 ~ 230 | 0.1 ~ 0.23 | 180 ~ 280 | 0.1 ~ 0.25 |
| | | NS740 · N308 | 100 ~ 180 | 0.1 ~ 0.18 | 150 ~ 200 | 0.1 ~ 0.23 |
| | | UX30 | 80 ~ 130 | 0.1 ~ 0.23 | 100 ~ 150 | 0.1 ~ 0.25 |
| | Die steels<br>< 30 HRC | T3130 | 100 ~ 150 | 0.1 ~ 0.15 | 100 ~ 150 | 0.1 ~ 0.2 |
| | | UX30 | 80 ~ 130 | 0.1 ~ 0.15 | 80 ~ 130 | 0.1 ~ 0.2 |
| M | Stainless steels<br>< 250 HB | AH120 · AH140 | 150 ~ 230 | 0.15 ~ 0.2 | 200 ~ 250 | 0.15 ~ 0.23 |
| | | UX30 | 150 ~ 180 | 0.15 ~ 0.2 | 180 ~ 200 | 0.15 ~ 0.23 |

Notes: • Dry cutting is recommended for above materials.
• When wet machining mild steels, carbon steels and alloy steels, use T3130 at lower cutting conditions.
• No. of revolutions ($min^{-1}$) = Cutting speed 3 1000 ÷ 3.14 ÷ Cutter diameter
• Table feed (mm/min) = No. of revolutions 3 Feed per tooth 3 No. of inserts

## TGN4200R-A

65° wedge type face mill with negative square insert






| Designation | Max. ap | øDc | z | øD1 | Lf | ød | ℓ | a | b | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TGN4203R-AE | 6 | 80 | 5 | 92 | 50 | 27 | 22 | 12.4 | 7 | 1.5 | SN*N43Z*/SNMN1204... |
| TGN4204R-AE | 6 | 100 | 6 | 112 | 63 | 32 | 32 | 14.4 | 8 | 2.4 | SN*N43Z*/SNMN1204... |
| TGN4205R-AE | 6 | 125 | 8 | 136 | 63 | 40 | 32 | 16.4 | 9 | 3.9 | SN*N43Z*/SNMN1204... |
| TGN4206R-AE | 6 | 160 | 10 | 171 | 63 | 40 | 29 | 16.4 | 9 | 6.1 | SN*N43Z*/SNMN1204... |

### SPARE PARTS

| Designation | Locator | Right-left screw | Screw | Wedge | Wrench |
|---|---|---|---|---|---|
| TGN42... | LN423R | FDS-8S | CM4X0.7X14 | WP440R | TP-4 |

## INSERT

### SNCN/SNKN43Z

SN*N43Z*N

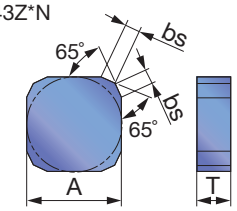



Fig.1

### SNMN1204-TN

SN*N43Z*N

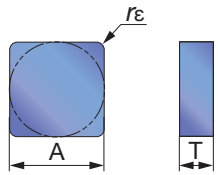



Fig.2

### SNKF43Z

SNKF43Z*N

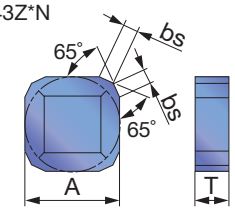



Fig.3

| | | Coating | | | | Cermet | | | | Ceramic | | | | Uncoated | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | | ★ | | | ★ | ☆ | | | | | | | ☆ | | | | | | | |
| M | Stainless | | | | | | | | | | | | | | | | | | | | |
| K | Cast iron | ★ | | | | | | | | ★ | | | | | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | ★ | | | | | | |
| S | Superalloys | | | | | | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | |

★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | T1115 | T3130 | NS740 | N308 | FX105 | UX30 | TH10 | A | T | bs | Fig. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SNCN43ZFN | - | 6 | | | | | | | ● | 12.7 | 4.76 | 2 | 1 |
| SNCN43ZTN | - | 6 | | | ● | ● | | ● | | 12.7 | 4.76 | 2 | 1 |
| SNKF43ZFN | - | 6 | | | | | | | ● | 12.7 | 4.76 | 2 | 3 |
| SNKF43ZTN | - | 6 | ● | | | | | ● | | 12.7 | 4.76 | 2 | 3 |
| SNKN43ZTN | - | 6 | ● | ● | ● | | ● | ● | | 12.7 | 4.76 | 2 | 1 |
| SNMN120408TN | 0.8 | 6 | | | | | ● | | | 12.7 | 4.76 | - | 2 |
| SNMN120412TN | 1.2 | 6 | ● | ● | | | ● | ● | | 12.7 | 4.76 | - | 2 |
| SNMN120416TN | 1.6 | 6 | | | | | ● | | | 12.7 | 4.76 | - | 2 |
| SNMN120420TN | 2 | 6 | | | | | ● | | | 12.7 | 4.76 | - | 2 |
| SNMN120424TN | 2.4 | 6 | | | | | ● | | | 12.7 | 4.76 | - | 2 |

Notes: Inserts can be used for former PS-series TAC mills.

●: Line-up

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Grade | Roughing (Depth of cut: 1.5 ~ 4 mm) | | Finishing (Depth of cut: 0.3 ~ 0.7 mm) | |
|---|---|---|---|---|---|---|
| | | | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) |
| P | Mild steels<br>Unhardened steels<br>< 180 HB | T3130 | 150 ~ 250 | 0.1 ~ 0.3 | 180 ~ 250 | 0.1 ~ 0.3 |
| | | NS740 · N308 | 100 ~ 200 | 0.1 ~ 0.2 | 150 ~ 250 | 0.1 ~ 0.25 |
| | | UX30 | 100 ~ 180 | 0.1 ~ 0.3 | 130 ~ 200 | 0.1 ~ 0.3 |
| | Carbon steels<br>Alloy steels<br>< 300 HB | T3130 | 130 ~ 250 | 0.1 ~ 0.3 | 150 ~ 250 | 0.1 ~ 0.3 |
| | | NS740 · N308 | 100 ~ 180 | 0.1 ~ 0.2 | 150 ~ 200 | 0.1 ~ 0.25 |
| | | UX30 | 80 ~ 130 | 0.1 ~ 0.3 | 100 ~ 150 | 0.1 ~ 0.3 |
| K | Cast irons<br>Ductile cast irons | TH10 · UX30 | 80 ~ 130 | 0.1 ~ 0.25 | 80 ~ 130 | 0.1 ~ 0.3 |
| | | T1115 | 100 ~ 200 | 0.1 ~ 0.2 | 100 ~ 200 | 0.1 ~ 0.25 |
| | | FX105 | 200 ~ 500 | 0.1 ~ 0.35 | 200 ~ 600 | 0.1 ~ 0.4 |

Notes:
- Dry cutting is recommended for above materials.
- When wet machining mild steels, carbon steels and alloy steels, use T3130 at lower cutting conditions.

# The world's highest level repeatability

# S-TAQ System



## ● Improved surface quality and increased tool life

- Two-face restricted (1/10 short taper and flange face) coupling.
- High-level coupling performance contributes to high accuracy and excellent rigidity.
- Excellent dynamic balance reduces vibration, chatter, and cutting noise at high speeds.

## ● Improved productivity

- High speed machining can reduce machining time.
- High repeatability can eliminate trial cut.

## ● Labor-saving tool change

- Can eliminate detaching the toolholder from the main spindle.
- Can eliminate the brakes for the main spindle.
- Labor-saving clamping by only one T-wrench.

## Performance

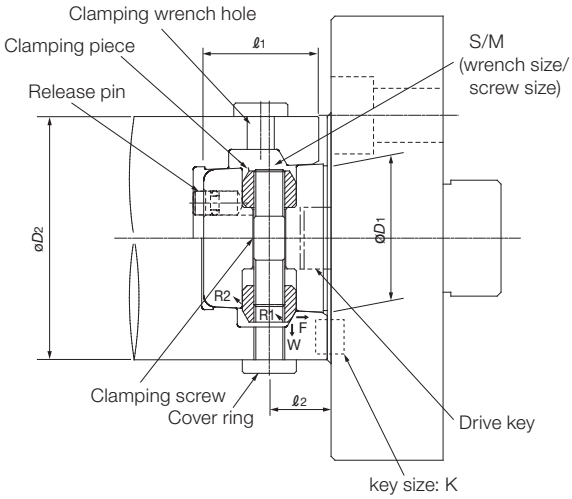
Original clamp system provides high rigidity, accuracy and operating speed.

### ● Clamping force (Strong clamp system)

· Lubricant coating on clamping piece.
· 4-points balancing clamp.
· Sufficient clamping for the smaller diameter part of taper.

| Designation | Dimensions (mm) øD1 | øD2 | ℓ1 | ℓ2 | S/M | K | Recommend clamping torque (N·m) | Clamping force (N) |
|---|---|---|---|---|---|---|---|---|
| TAQ32 | 19 | 32 | 18 | 8.5 | 3/M6 | 8 | 3 | $4\times10^3$ |
| TAQ40 | 24 | 40 | 21 | 10 | 3/M6 | 1 0 | 5 | $5.5\times10^3$ |
| TAQ50 | 30 | 50 | 25 | 12 | 4/M8 | 12 | 8 | $9\times10^3$ |
| TAQ63 | 38 | 63 | 32 | 15 | 4/M8 | 16 | 10 | $12\times10^3$ |
| TAQ80 | 48 | 80 | 40 | 18 | 5/M10 | 18 | 20 | $18\times10^3$ |
| TAQ100 | 60 | 100 | 50 | 22 | 6/M12 | 20 | 30 | $23\times10^3$ |

## Part assembly




W: Driving force by clamping screw
F: Clamping force
R1 = R2: Receiving force of clamping piece

# DATA

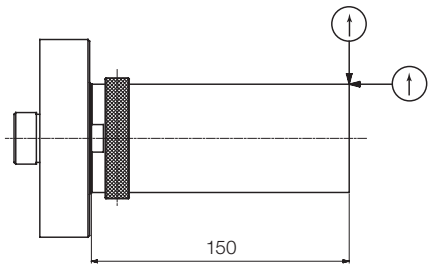
Comparison of clamping force

| | Taper | Taper dia.(mm)/holder dia.(mm) | Recommend clamping torque (N/m) | Draw-in force (N) | Draw-in force / Torque (m-1) |
|---|---|---|---|---|---|
| TAQ63 | 1 / 10 | 38 / 63 | 10 | $12\times10^3$ | 1200 |
| QC adapter | 10° | 35 / 70 | 20 | $9.8\times10^3$ | 490 |
| Other makes A | 4° | 35 / 62 | 22.5 | $9.8\times10^3$ | 436 |

## ●Repeatability for accuracy

| | |
|---|---|
| Radial run out | Within 0.003 mm |
| Axial run out | Within 0.002 mm |

Note: Measured at 150 mm far from end face.

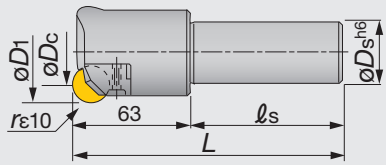


## ERD6000

Indexable endmill with 20mm button insert

A.R. = +8°,R.R. = -2°~ +3°





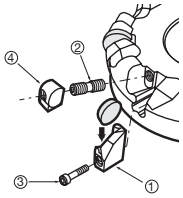

Right hand (R) shown.

| Designation | Max. *ap* | *øD*1 | z | *øD*c | *øD*s | *ℓ*s | *L* | Insert |
|---|---|---|---|---|---|---|---|---|
| ERD6050RA | 10 | 50 | 3 | 30 | 32 | 80 | 143 | RD**2004... |
| ERD6063RA | 10 | 63 | 3 | 43 | 32 | 80 | 143 | RD**2004... |

### SPARE PARTS

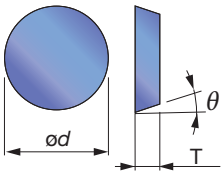
| Designation | ①Locator | ②Wedge fixing screw | ③Locator fixing screw | ④Wedge | Wrench |
|---|---|---|---|---|---|
| ERD60... | LR602R | FDS-6Z | SHCM4-16 | WR602R | TP-3A |

Note: Plunging up to 4mm depth is possible.




## INSERT

### RDCN/RDCA/RDKN2004




| | | | | | | |
|---|---|---|---|---|---|---|
| P | Steel | ★ | | ☆ | | |
| M | Stainless | | | | | |
| K | Cast iron | ★ | | | | |
| N | Non-ferrous | | | | ★ | |
| S | Superalloys | ★ | | | | |
| H | Hard materials | | | | | |

★ : First choice
☆ : Second choice

| Designation | Max. *ap* | Coating | | Uncoated | | A | T | *θ*° |
|---|---|---|---|---|---|---|---|---|
| | | AH120 | | UX30 | TH10 | | | |
| RDCA2004TN | 10 | | | ● | | 20 | 4.76 | 15 |
| RDCN2004TN | 10 | | | ● | | 20 | 4.76 | 15 |
| RDKN2004FN | 10 | | | | ● | 20 | 4.76 | 15 |
| RDKN2004TN | 10 | ● | | ● | | 20 | 4.76 | 15 |

The above figure shows RD*N-type insert.
• RDCA type inserts have a hole.
Note: The inserts can be used for the former PS series.

●: Line-up

Face Milling

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Grade | Cutting speed *Vc* (m/min) | Depth of cut: 0.4 ~ 1 Feed per tooth *fz* (mm/t) | Depth of cut: 1.5 ~ 3 Feed per tooth *fz* (mm/t) | Depth of cut: 4 ~ 6 Feed per tooth *fz* (mm/t) |
|---|---|---|---|---|---|---|
| P | Carbon steels, alloy steels < 300HB | AH120 | 150 ~ 250 | 0.3 ~ 0.5 | 0.2 ~ 0.3 | 0.1 ~ 0.2 |
| | | UX30 | 80 ~ 150 | 0.3 ~ 0.6 | 0.2 ~ 0.3 | 0.1 ~ 0.2 |
| | Die steels < 30HRC | AH120 | 100 ~ 150 | 0.2 ~ 0.4 | 0.15 ~ 0.3 | 0.1 ~ 0.2 |
| | | UX30 | 80 ~ 130 | 0.25 ~ 0.5 | 0.15 ~ 0.3 | 0.1 ~ 0.2 |
| K | Grey cast irons, ductile cast irons | AH120 | 100 ~ 150 | 0.3 ~ 0.6 | 0.2 ~ 0.4 | 0.1 ~ 0.25 |
| | | TH10 | 80 ~ 130 | 0.3 ~ 0.6 | 0.2 ~ 0.4 | 0.1 ~ 0.25 |
| H | Hardened steels 40 ~ 55HRC | AH120 | 20 ~ 60 | 0.1 ~ 0.2 | 0.05 ~ 0.2 | - |
| | | UX30 | 20 ~ 60 | 0.1 ~ 0.2 | 0.05 ~ 0.2 | - |

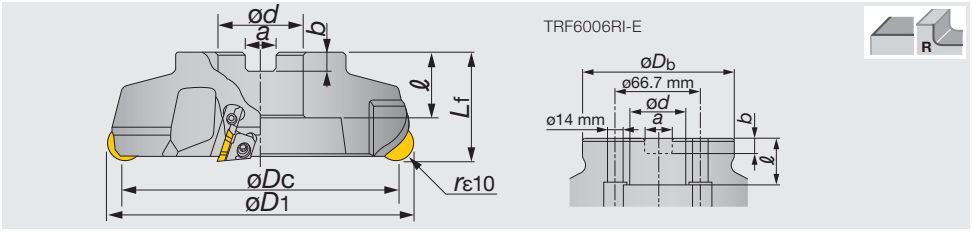
Note: Feed rate should be inversely proportional to depth of cut and selected depending on machine rigidity.

## TRF6000

Face mill with 20mm high posi-rake button insert

A.R. = +19°,R.R. = +3°






| Designation | Max. ap | øDc | z | øD1 | Lf | ød | ℓ | a | b | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TRF6003RI-E | 10 | 80 | 4 | 100 | 50 | 27 | 26 | 12.4 | 7 | 1.4 | RFEN2004... |
| TRF6004RI-E | 10 | 100 | 5 | 120 | 63 | 32 | 32 | 14.4 | 8 | 2.5 | RFEN2004... |
| TRF6005RI-E | 10 | 125 | 6 | 145 | 63 | 40 | 32 | 16.4 | 9 | 3.9 | RFEN2004... |
| TRF6006RI-E | 10 | 160 | 8 | 180 | 63 | 40 | 29 | 16.4 | 9 | 5.8 | RFEN2004... |

### SPARE PARTS

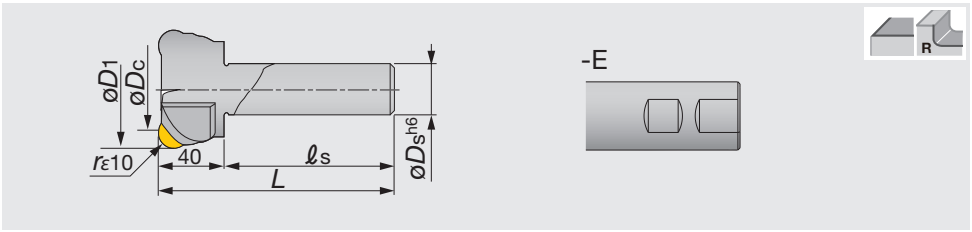
| Designation | ①Locator | ②Wedge fixing screw | ③Locator fixing screw | ④Wedge | Wrench |
|---|---|---|---|---|---|
| TRF60... | LF602R | FDS-8S | CM4X0.7X20 | WF603R | TP-4 |

## ERF6000

Indexable endmill with 20mm high posi-rake button insert for difficult-to-cut material

A.R. = +19°,R.R. = +3°



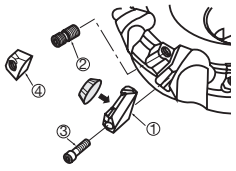



| Designation | øDc | z | øD1 | øDs | ℓs | L | Insert |
|---|---|---|---|---|---|---|---|
| ERF6050R | 50 | 3 | 70 | 32 | 80 | 120 | RFEN2004... |
| ERF6063R | 63 | 4 | 83 | 32 | 80 | 120 | RFEN2004... |
| ERF6050R-E | 50 | 3 | 70 | 32 | 80 | 120 | RFEN2004... |
| ERF6063R-E | 63 | 4 | 83 | 32 | 80 | 120 | RFEN2004... |

### SPARE PARTS

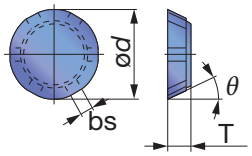
| Designation | ①Locator | ②Wedge fixing screw | ③Locator fixing screw | ④Wedge | Wrench |
|---|---|---|---|---|---|
| ERF60... | LF602R | FDS-6Z | CM4X0.7X20 | WF602R | TP-3A |

Note: The above TAC Endmills are not irregular pitch spec.

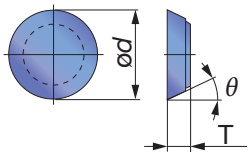


## INSERT

### RFEN2004




### RFEN2004M0TN




| | | | | | | | |
|---|---|---|---|---|---|---|---|
| P | Steel | ☆ | ☆ | | ☆ | | |
| M | Stainless | ★ | ★ | | ☆ | | |
| K | Cast iron | ★ | | | | | |
| N | Non-ferrous | | | | | | |
| S | Superalloys | ★ | | | | ★ | |
| H | Hard materials | | | | | ★ | |

★ : First choice
☆ : Second choice

| Designation | Max. ap | Coating AH120 | Coating GH330 | Uncoated UX30 | Uncoated KS20 | ød | T | θ° | bs |
|---|---|---|---|---|---|---|---|---|---|
| RFEN2004ZFTN | 3 | ● | ● | ● | ● | 20 | 4.76 | 25 | 2.8 |
| RFEN2004M0TN | 10 | | ● | ● | ● | 20 | 4.76 | 25 | - |

●: Line-up

Note: • RFEN2004M0TN type inserts should not be used for finishing requiring surface finish better than 12s.
• RFEN2004ZFTN type inserts can be used both finishing and roughing at depth of cut up to 3mm.
• RFEN2004M0TN does not have flattened flanks.

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | | Grade | Depth of cut = 1 ~ 3 mm: Cutting speed *vc*(m/min) | Depth of cut = 1 ~ 3 mm: Feed per tooth *fz* (mm/t) | Depth of cut = 0.4 ~ 1 mm: Cutting speed *vc*(m/min) | Depth of cut = 0.4 ~ 1 mm: Feed per tooth *fz* (mm/t) | Cutting fluid |
|---|---|---|---|---|---|---|---|---|
| M | Stainless steels | Austenitic, Ferritic SUS304, X5CrNi18-9 < 300HB | AH120 · GH330 | 150 ~ 250 | 0.20 ~ 0.35 | 180 ~ 250 | 0.2 ~ 0.5 | Dry cutting |
| | | | UX30 | 150 ~ 230 | 0.20 ~ 0.35 | 180 ~ 250 | 0.2 ~ 0.5 | Dry cutting |
| | | Precipitatio hardening SUS630, X5CrNiCuNb16-4 < 35HRC | AH120 · GH330 | 150 ~ 200 | 0.15 ~ 0.3 | 180 ~ 250 | 0.2 ~ 0.4 | Dry cutting |
| | | | UX30 | 130 ~ 180 | 0.15 ~ 0.3 | 150 ~ 200 | 0.2 ~ 0.4 | Dry cutting |
| S | Superalloys Inconel, Hastelloy etc. | | KS20 | 20 ~ 30 | 0.10 ~ 0.15 | 20 ~ 50 | 0.2 ~ 0.4 | Water insoluble type |
| | Titanium alloys Ti-6Al-4V etc. | | KS20 | 40 ~ 50 | 0.15 ~ 0.35 | 40 ~ 60 | 0.2 ~ 0.5 | Water soluble type or dry cutting |
| H | Hard materials 40 ~ 50HRC | | KS20 | 20 ~ 50 | 0.05 ~ 0.1 | 20 ~ 50 | 0.05 ~ 0.2 | Water insoluble type |

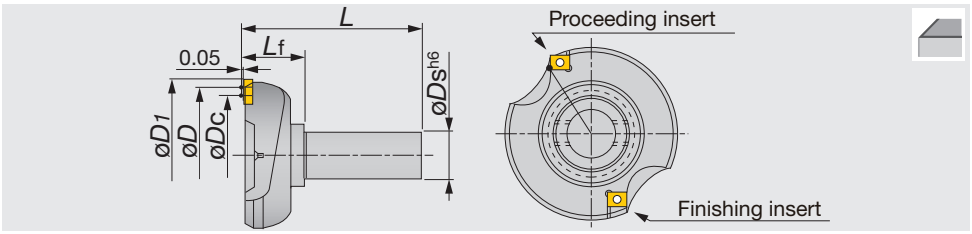
Note: Cutting width should be within 60 to 70 % of effective cutter diameter.
• No. of revolutions ($min^{-1}$) = Cutting speed × 1000 ÷ 3.14 ÷ Cutter diameter
• Table feed (mm/min) = No. of revolutions × Feed per tooth × No. of inserts

## EMS09

Endmill with negative rectangle insert for highly precision finishing

A.R. = +10°, R.R. = -30°






| Designation | Max. *ap* | ø*Dc* | z | ø*D* | ø*D1* | ø*Ds* | *Lf* | *L* | Insert |
|---|---|---|---|---|---|---|---|---|---|
| EMS09080R | 0.2 | 80 | 2 | 92 | 100.7 | 32 | 40 | 120 | LNCQ0906... |

SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| EMS09080R | CSTB-4 | T-15D |

## INSERT

### LNCQ0906N-100(50)L

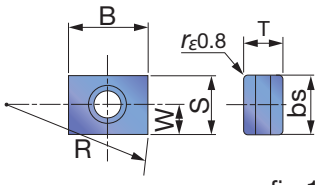



fig.1

### LNCQ0906-50S

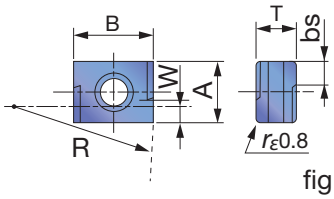



fig.2

| | | Coating | | Cermet | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Designation | Max. *ap* | AH120 | GH110 | NS740 | A | B | T | R | W | bs | fig |
| P | Steel | | ☆ | | ★ | | | | | | | | | |
| M | Stainless | | ★ | | ★ | | | | | | | | | |
| K | Cast iron | | ★ | ★ | | | | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | |
| S | Superalloys | | ★ | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | |
| | LNCQ0906N-100L | 0.2 | ● | ● | ● | 9.525 | 12.7 | 6.35 | 100 | 4.763 | 7.9 | 1 | | |
| | LNCQ0906N-50L | 0.2 | ● | ● | ● | 9.525 | 12.7 | 6.35 | 50 | 4.763 | 7.9 | 1 | | |
| | LNCQ0906R-50S | 0.2 | ● | ● | ● | - | 12.7 | 6.35 | 50 | 2.3 | 4 | 2 | | |

★ : First choice
☆ : Second choice

●: Line-up

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Grade | Cutting speed *vc* (m/min) | LNCQ0906N-100(50)L | | LNCQ0906R-50S | |
|---|---|---|---|---|---|---|---|
| | | | | Depth of cut *ap* (mm) | Feed per tooth *f* (mm/rev) | Depth of cut *ap* (mm) | Feed per tooth *f* (mm/rev) |
| P | Mild steels E275A, etc. < 180 HB | NS740 | 200 ~ 300 | < 0.2 | 2 ~ 6 | ≤0.2 | 1 ~ 2.5 |
| P | Carbon steels C55, etc. < 300 HB | NS740 | 150 ~ 250 | | | | |
| P | Alloy steels 42CrMo4, etc. < 300 HB | NS740 | 120 ~ 200 | | | | |
| P | Die steels X40CrMoV5-1, etc. < 300 HB | NS740 | 100 ~ 150 | | | | |
| M | Stainless steels X5CrNi18-9, X5CrNiMo17-12-3, etc. | AH120 NS740 | 150 ~ 220 | < 0.2 | 2 ~ 6 | ≤0.2 | 1 ~ 2.5 |
| K | Cast irons 250, etc. | GH110 AH120 | 120 ~ 200 | < 0.2 | 2 ~ 6 | ≤0.2 | 1 ~ 2.5 |

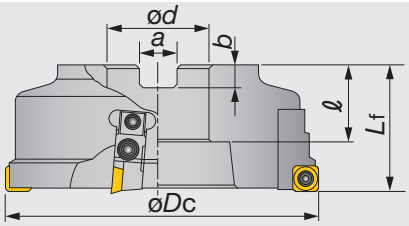
Face Milling

## SFP4000R

Face mills with adjustable structure for super finishing

A.R. = +5°,R.R. = -20°





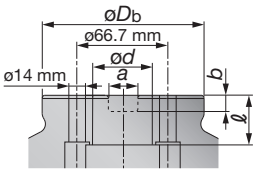

| Designation | Max. ap | øDc | z | Lf | ød | ℓ | a | b | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| SFP4004R-E | 0.1 | 100 | 2 | 63 | 32 | 32 | 14.4 | 8 | 2.3 | SPHA435FNW |
| SFP4005R-E | 0.1 | 125 | 2 | 63 | 40 | 32 | 16.4 | 9 | 3.5 | SPHA435FNW |
| SFP4006R-E | 0.1 | 160 | 4 | 63 | 40 | 29 | 16.4 | 9 | 5.8 | SPHA435FNW |

SPARE PARTS

| Designation | Clamping screw | Locator | Right-left screw | Locator fixing screw | Socket-head screw | Wedge | Wrench | Washer | Washer 1 | Wrench 1 |
|---|---|---|---|---|---|---|---|---|---|---|
| SFP40... | CSTA-5S | LW400R | FDS-8S | CM5X0.8X16 | CM5X0.8X8 | FW-305 | T-15D | 5S | L5 | P-4 |

## Arbor type

### SFP4006R-E

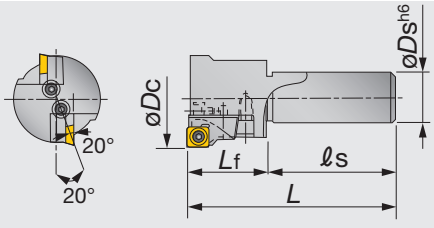



## EFP4000R

Endmills with adjustable structure for super finishing

A.R. = +5°, R.R. = -20°






| Designation | Max. ap | øDc | z | øDs | ℓs | L | Lf | Insert |
|---|---|---|---|---|---|---|---|---|
| EFP4050R | 0.1 | 50 | 1 | 32 | 80 | 120 | 40 | SPHA435FNW |
| EFP4063R | 0.1 | 63 | 2 | 32 | 80 | 130 | 50 | SPHA435FNW |

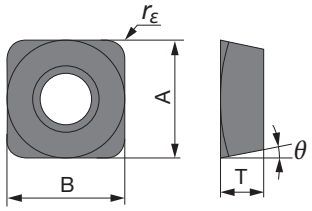
・EFP4050R doesn't have adjustable system.

SPARE PARTS

| Designation | Clamping Screw | Locator | Right-left screw | Locator fixing screw | Socket-head screw | Wedge | Wrench | Washer | Washer 1 | Wrench 1 |
|---|---|---|---|---|---|---|---|---|---|---|
| EFP4050R | CSTA-5S | LW402R | - | CM5X0.8X16 | - | - | T-15D | - | - | - |
| EFP4063R | CSTA-5S | LW400R | FDS-8S | CM5X0.8X16 | CM5X0.8X18 | FW-305 | T-15D | 5S | L5 | P-4 |

## INSERT

### SPHA435




| | | | |
|---|---|---|---|
| P | Steel | ★ | |
| M | Stainless | ★ | |
| K | Cast iron | | ★ |
| N | Non-ferrous | | ★ |
| S | Superalloys | | |
| H | Hard materials | | |

★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | Cermet N308 | Un-coated TH10 | A | B | T | θ° |
|---|---|---|---|---|---|---|---|---|
| SPHA435FNW | 2 | 0.1 | ● | ● | 12.7 | 12.7 | 4.76 | 11 |

●: Line-up

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Grade | Cutting speed Vc (m/min) | Feed per revolution f (mm/rev) SFP | Feed per revolution f (mm/rev) EFP | Depth of cut ap (mm) |
|---|---|---|---|---|---|---|
| P | Mild steels | N308 | 180 ~ 250 | ≤6 | ≤4 | ≤0.1 |
| P | Carbon steels | N308 | 150 ~ 200 | ≤6 | ≤4 | ≤0.1 |
| P | Alloy steels | N308 | 150 ~ 200 | ≤6 | ≤4 | ≤0.1 |
| M | Stainless steels | N308 | 160 ~ 200 | ≤4 | ≤3 | ≤0.1 |
| K | Cast irons | TH10 | 100 ~ 150 | ≤5 | ≤3 | ≤0.2 |
| N | Non-ferrous metals | TH10 | 200 ~ 500 | ≤6 | ≤4 | ≤0.1 |

Note:
Under above conditions, attainable surface roughness is 3 to 4 μm *Rz*JIS for steels and 6 ~ 12 μm *Rz*JIS for cast irons.
• No. of revolutions ($min^{-1}$) = Cutting speed × 1000 ÷ 3.14 ÷ Cutter diameter
• Table feed (mm/min) = No. of revolutions × Feed per tooth × No. of inserts



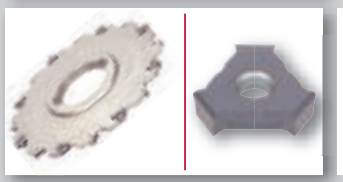
## TUNGMINISLIT

D174

Thin width slitting cutter with self-clamping insert

**ø63 - ø125 mm**
**Slot width 1.6 - 4.1 mm**

P M K



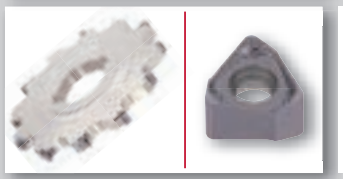
## TUNGTHINSLIT

D177

Slot milling cutters available in axial drive type working with 6-cornered tangentially mounted inserts

**ø80 - ø200 mm**
**Slot width 4 - 8 mm**

P M K S



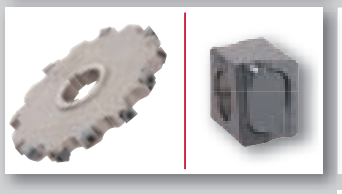
## TUNGUNIVERSALSLOT

D179

Axial and radial drive type slot milling cutters with 6-cornered radially mounted inserts

**ø80 - ø160 mm**
**Slot width 9 - 16 mm**

P M K S



## TECTANGENTIALSLOT

D182

Axial and radial drive type slot milling cutters for wider slots with tangentially mounted inserts

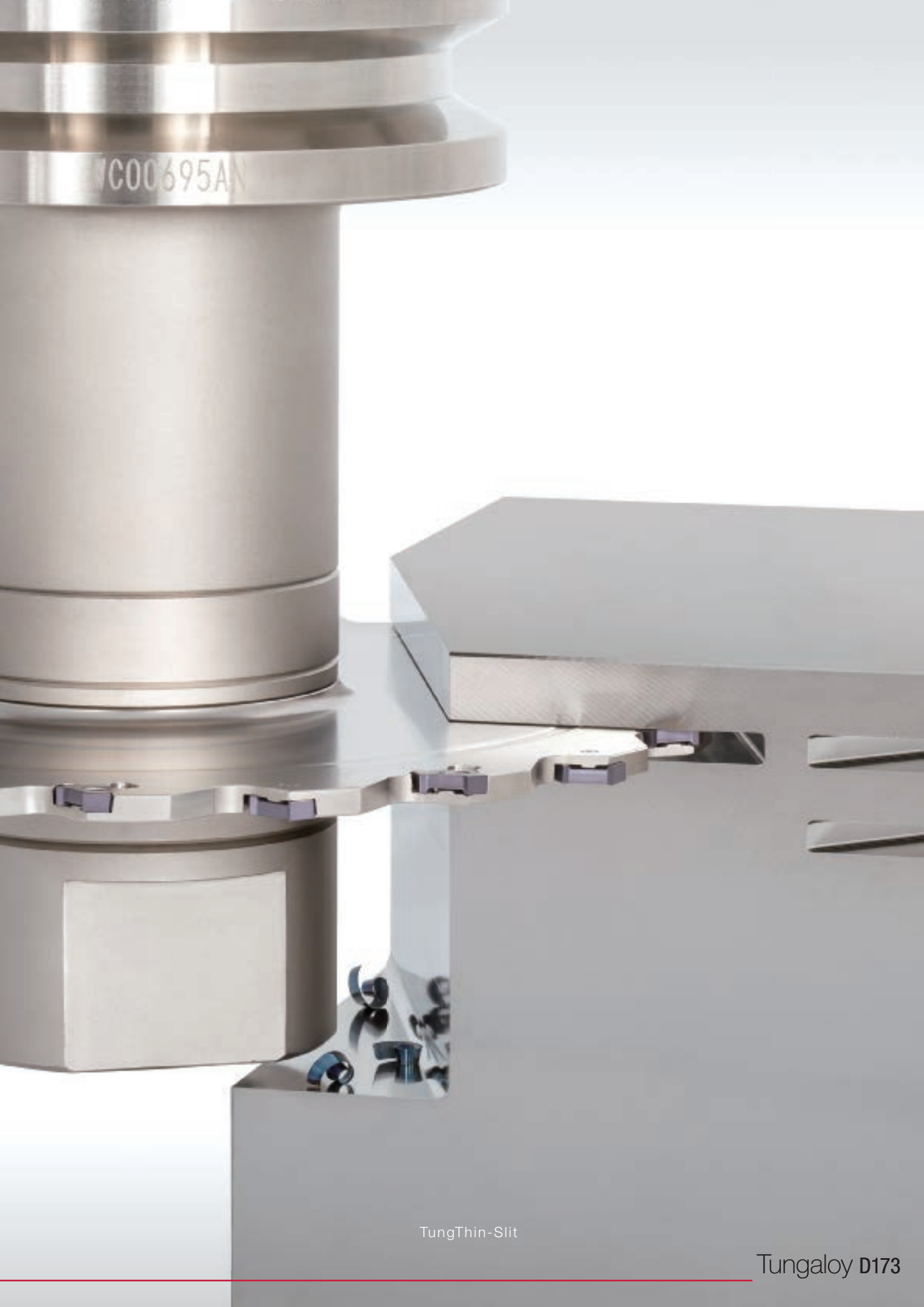
**ø100 - ø250 mm**
**Slot width 16 - 25 mm**

P M K S

## Other Slot Milling Tools

D185

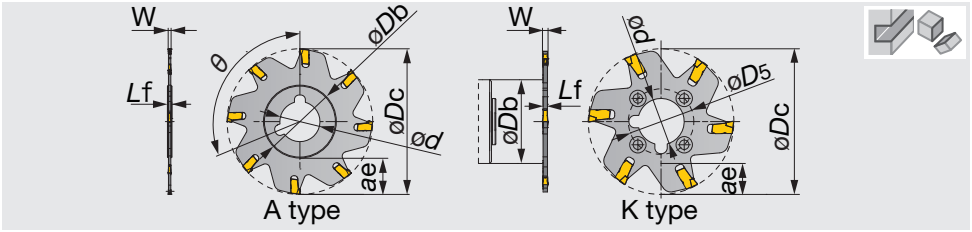
SVN4000



TungThin-Slit

Side cutter for thin slitting and cutting off






| Designation | W min | W max | øDc | z | øDb | ød | øD5 | Lf | Max. ae | θ° | SS | SS | Drive flange | type | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SSG01R063-E1.6 | 1.6 | 1.6 | 63 | 6 | 32 | 10 | 22 | 2.4 | 14 | 0 | SW25-32 | SW1.00-32 | - | K | SSS16N |
| ASG01N080-E1.6 | 1.6 | 1.6 | 80 | 8 | 39 | 22 | - | 2.4 | 16 | 112.5 | - | - | - | A | SSS16N |
| ASG01N100-E1.6 | 1.6 | 1.6 | 100 | 10 | 39 | 22 | - | 2.4 | 30 | 90 | - | - | - | A | SSS16N |
| ASG01N125-E1.6 | 1.6 | 1.6 | 125 | 12 | 64 | 27 | - | 2.4 | 30 | 75 | - | - | - | A | SSS16N |
| SSG02R063-E2 | 1.85 | 2.5 | 63 | 6 | 32 | 10 | 22 | 2.4 | 15 | 0 | SW25-32 | SW1.00-32 | - | K | SS*22N |
| ASG02N080-E2 | 1.85 | 2.5 | 80 | 8 | 39 | 22 | - | 2.4 | 20 | 112.5 | - | - | - | A | SS*22N |
| ASG02N100-E2 | 1.85 | 2.5 | 100 | 10 | 39 | 22 | - | 2.4 | 30 | 90 | - | - | - | A | SS*22N |
| ASG02N125-E2 | 1.85 | 2.5 | 125 | 12 | 60 | 27 | - | 2.4 | 32 | 75 | - | - | - | A | SS*22N |
| SSG03R063-E3 | 2.65 | 3.5 | 63 | 5 | 32 | 10 | 22 | 2.4 | 15 | 0 | SW25-32 | SW1.00-32 | - | K | SS*31N |
| SSG03R080-E3 | 2.65 | 3.5 | 80 | 6 | 40(1) | 22 | 32 | 2.4 | 19(2) | 0 | SW32-40 | - | R22-46 | K | SS*31N |
| SSG03R100-E3 | 2.65 | 3.5 | 100 | 6 | 40(1) | 22 | 32 | 2.4 | 29(3) | 0 | SW32-40 | - | R22-46 | K | SS*31N |
| SSG03R125-E3 | 2.65 | 3.5 | 125 | 8 | 55 | 32 | 45 | 2.4 | 34 | 0 | SW32-55 | - | R32-55 | K | SS*31N |
| SSG04R063-E4 | 4 | 4.5 | 63 | 5 | 32 | 10 | 22 | 3.2 | 15 | 0 | SW25-32 | SW1.00-32 | - | K | SS*41N |
| SSG04R080-E4 | 4 | 4.5 | 80 | 6 | 40(1) | 22 | 32 | 3.2 | 19(2) | 0 | SW32-40 | - | R22-46 | K | SS*41N |
| SSG04R100-E4 | 4 | 4.5 | 100 | 6 | 40(1) | 22 | 32 | 3.2 | 29(3) | 0 | SW32-40 | - | R22-46 | K | SS*41N |
| SSG04R125-E4 | 4 | 4.5 | 125 | 8 | 55 | 32 | 45 | 3.2 | 34 | 0 | S32-55 | - | R32-55 | K | SS*41N |

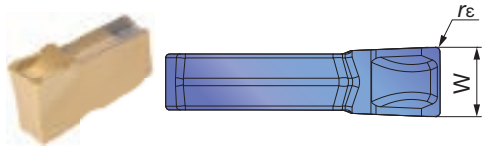
(1) When using a drive flange, øDb = 46 mm
(2) When using a drive flange, Max. ae = 16 mm
(3) When using a drive flange, Max. ae = 26 mm

## SPARE PARTS

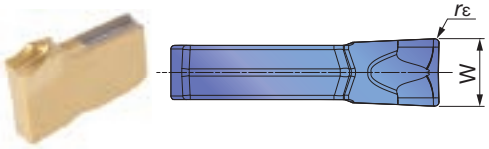
| Designation | Extractor | Grip |
|---|---|---|
| SSG01/02... | ESG0.5 | - |
| ASG01/02... | ESG0.5 | - |
| SSG03/04... | - | ESG1 |

## INSERT

### SSM




### SSS




| | | |
|---|---|---|
| P | Steel | ★ |
| M | Stainless | ★ |
| K | Cast iron | ★ |
| N | Non-ferrous | |
| S | Superalloys | |
| H | Hard materials | |

★ : First choice
☆ : Second choice

| Designation | rε | Coating GH130 | W±0.04 |
|---|---|---|---|
| SSM22N | 0.2 | ● | 2.2 |
| SSM31N | 0.2 | ● | 3.1 |
| SSM41N | 0.25 | ● | 4.1 |
| SSS16N | 0.16 | ● | 1.6 |
| SSS22N | 0.2 | ● | 2.2 |
| SSS31N | 0.2 | ● | 3.1 |
| SSS41N | 0.25 | ● | 4.1 |

●: Line-up

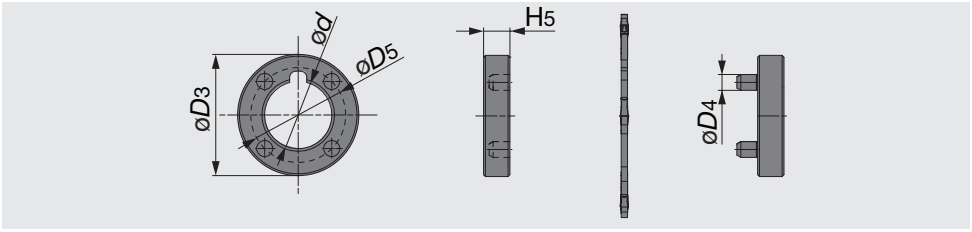
## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Hardness (HB) | Insert | Cutting speed *Vc* (m/min) | Chip thickness t (mm) |
|---|---|---|---|---|---|
| P | Low carbon steel<br>E275A, C15E4, etc. | - 200 | SSM... | 150 - 230 | 0.05 - 0.15 |
| | High carbon steel<br>E355D, C55, etc. | 200 - 300 | SSM... | 100 - 170 | 0.04 - 0.13 |
| | Alloy steels<br>42CrMo4, 20Cr4, etc. | 150 - 300 | SSM... | 90 - 160 | 0.04 - 0.13 |
| | Tool steel<br>X153CrMoV12, X40CrMoV5-1, etc. | - 300 | SSM... | 70 - 120 | 0.04 - 0.13 |
| M | Stainless steel<br>X5CrNi18-9, X5CrNiMo17-12-3, etc. | - | SSS... | 90 - 200 | 0.04 - 0.13 |
| K | Grey cast iron<br>250, 300, etc. | 150 - 250 | SSM... | 100 - 200 | 0.05 - 0.15 |
| | Ductile cast iron<br>400-15S, etc. | 150 - 250 | SSM... | 80 - 130 | 0.05 - 0.15 |

## R (drive flange set)

Drive flange set for side cutters



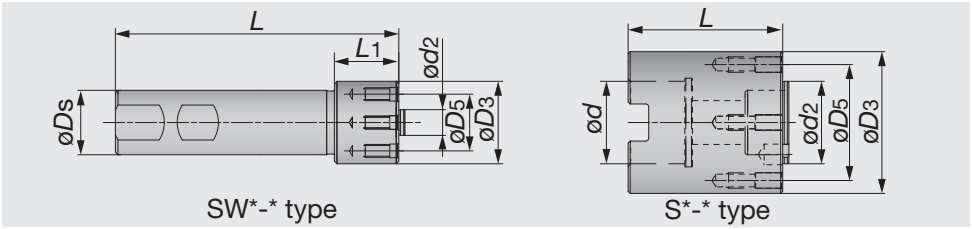



| Designation | ød | øD3 | øD4 | øD5 | H5 |
|---|---|---|---|---|---|
| R22-46 | 22 | 46 | 6 | 45 | 10 |
| R32-55 | 32 | 55 | 6 | 45 | 10 |

## SW/S

Drive shanks for side cutters






| Designation | øDs | ød | ød2 | øD3 | øD5 | L1 | L |
|---|---|---|---|---|---|---|---|
| SW25-32 | 25 | - | 10 | 32 | 22 | 25 | 110 |
| SW32-40 | 32 | - | 22 | 40 | 32 | 30 | 120 |
| S32-55 | - | 32 | 32 | 55 | 45 | - | 60 |

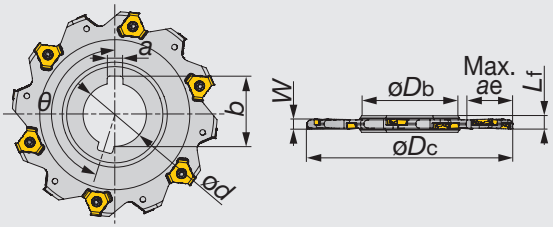
### SPARE PARTS

| Designation | Screw | Wrench | | |
|---|---|---|---|---|
| | | Mono block type | Torx bit | Handle |
| SW25-32 | SR76-961 | SETT-15/5 | - | - |
| SW32-40 | SR76-963 | SETT-15/5 | - | - |
| S32-55 | SR76-943 | - | BT20M | H-TB |

# ASV 02/03/04/05

Axial drive type slot milling cutter with tangentially mounted inserts






| Designation | *W* | *øDc* | Edge/Z | *øDb* | *ød* | *Lf* | *b* | *a* | Max. *ae* | *θ°* | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ASV02N080-E4 | 4 | 80 | 5/10 | 41 | 27 | 6 | 29.8 | 7 | 15 | 162 | TVKX0202... |
| ASV02N100-E4 | 4 | 100 | 6/12 | 47 | 32 | 6 | 34.8 | 8 | 20 | 165 | TVKX0202... |
| ASV02N125-E4 | 4 | 125 | 8/16 | 55 | 40 | 6 | 43.5 | 10 | 30 | 168.75 | TVKX0202... |
| ASV02N160-E4 | 4 | 160 | 10/20 | 55 | 40 | 6 | 43.5 | 10 | 45 | 171 | TVKX0202... |
| ASV03N080-E5 | 5 | 80 | 5/10 | 41 | 27 | 6.5 | 29.8 | 7 | 15 | 162 | TVKX03X3... |
| ASV03N100-E5 | 5 | 100 | 6/12 | 47 | 32 | 6.5 | 34.8 | 8 | 20 | 165 | TVKX03X3... |
| ASV03N125-E5 | 5 | 125 | 8/16 | 55 | 40 | 6.5 | 43.5 | 10 | 30 | 168.75 | TVKX03X3... |
| ASV03N160-E5 | 5 | 160 | 10/20 | 55 | 40 | 6.5 | 43.5 | 10 | 45 | 171 | TVKX03X3... |
| ASV04N080-E6 | 6 | 80 | 4/8 | 41 | 27 | 8 | 29.8 | 7 | 17 | 157.5 | TVKX04H3... |
| ASV04N100-E6 | 6 | 100 | 5/10 | 47 | 32 | 8 | 34.8 | 8 | 23.5 | 162 | TVKX04H3... |
| ASV04N125-E6 | 6 | 125 | 6/12 | 55 | 40 | 8 | 43.5 | 10 | 32.5 | 165 | TVKX04H3... |
| ASV04N160-E6 | 6 | 160 | 8/16 | 55 | 40 | 8 | 43.5 | 10 | 50 | 168.75 | TVKX04H3... |
| ASV04N200-E6 | 6 | 200 | 10/20 | 69 | 50 | 8 | 53.5 | 12 | 63 | 171 | TVKX04H3... |
| ASV05N080-E8 | 8 | 80 | 4/8 | 41 | 27 | 10 | 29.8 | 7 | 17 | 157.5 | TVKX0504... |
| ASV05N100-E8 | 8 | 100 | 5/10 | 47 | 32 | 10 | 34.8 | 8 | 23.5 | 162 | TVKX0504... |
| ASV05N125-E8 | 8 | 125 | 6/12 | 55 | 40 | 10 | 43.5 | 10 | 32.5 | 165 | TVKX0504... |
| ASV05N160-E8 | 8 | 160 | 8/16 | 55 | 40 | 10 | 43.5 | 10 | 50 | 168.75 | TVKX0504... |
| ASV05N200-E8 | 8 | 200 | 10/20 | 69 | 50 | 10 | 53.5 | 12 | 63 | 171 | TVKX0504... |

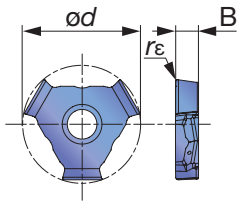
## SPARE PARTS

| Designation | Clamping screw | Grip | Lubricant | Torx bit | Wrench |
|---|---|---|---|---|---|
| ASV02/03N... | SR114-018-L3.40 | - | M-1000 | - | T-6D |
| ASV04N... | SR14-500/L5.1 | H-TB2W | M-1000 | BT15S | - |
| ASV05N... | SR14-500-L7.0 | H-TB2W | M-1000 | BT15S | - |

# INSERT

## TVKX-MJ






| | | | | |
|---|---|---|---|---|
| P | Steel | ☆ | | ★ |
| M | Stainless | | ★ | ☆ |
| K | Cast iron | ★ | | ☆ |
| N | Non-ferrous | | | |
| S | Superalloys | ★ | ☆ | ★ |
| H | Hard materials | | | |

★ : First choice
☆ : Second choice

| Designation | rε | Coating | | | B | ød |
|---|---|---|---|---|---|---|
| | | AH120 | AH130 | AH725 | | |
| TVKX020202TN-MJ | 0.2 | ● | | ● | 2.4 | 9.4 |
| TVKX020204TN-MJ | 0.4 | ● | | ● | 2.4 | 9.4 |
| TVKX03X302TN-MJ | 0.2 | ● | | ● | 3.2 | 9.4 |
| TVKX03X304TN-MJ | 0.4 | ● | | ● | 3.2 | 9.4 |
| TVKX04H304TN-MJ | 0.4 | ● | ● | ● | 3.5 | 16.9 |
| TVKX04H308TN-MJ | 0.8 | ● | ● | ● | 3.5 | 16.9 |
| TVKX050404TN-MJ | 0.4 | ● | ● | ● | 4.5 | 16.9 |
| TVKX050408TN-MJ | 0.8 | ● | ● | ● | 4.5 | 16.9 |

●: Line-up

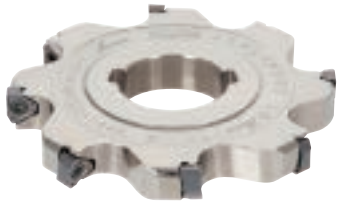


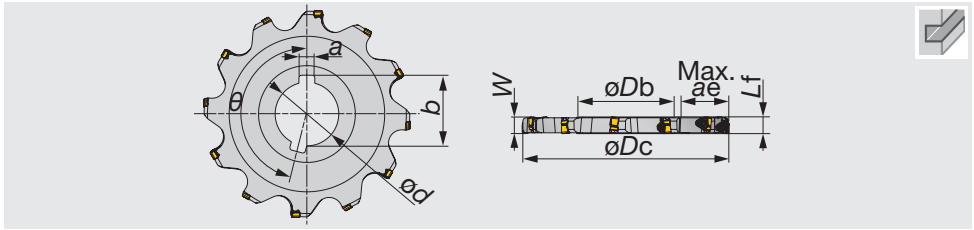
# STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Hardness (HB) | Priority | Grade | Cutting speed Vc (m/min) | Feed per edge line: fz (mm/t) ASV ae / øDc (mm) 10% | ASV ae / øDc (mm) 20% | ASV ae / øDc (mm) 30% | ASV ae / øDc (mm) ≤ 50% |
|---|---|---|---|---|---|---|---|---|---|
| P | Low carbon steels E275A, etc. | - 200 | First choice | AH725 | 90 - 180 | 0.08 - 0.25 | 0.06 - 0.19 | 0.05 - 0.16 | 0.05 - 0.15 |
| | | - 200 | For impact resistance | AH130 | 90 - 180 | 0.08 - 0.25 | 0.06 - 0.19 | 0.05 - 0.16 | 0.05 - 0.15 |
| | High carbon steels C45, etc. | 200 - 300 | First choice | AH725 | 90 - 180 | 0.07 - 0.22 | 0.05 - 0.16 | 0.04 - 0.14 | 0.04 - 0.13 |
| | | 200 - 300 | For impact resistance | AH130 | 90 - 180 | 0.07 - 0.22 | 0.05 - 0.16 | 0.04 - 0.14 | 0.04 - 0.13 |
| | Alloy steels 42CrMo4, etc. | 150 - 300 | First choice | AH725 | 90 - 180 | 0.07 - 0.22 | 0.05 - 0.16 | 0.04 - 0.14 | 0.04 - 0.13 |
| | | 150 - 300 | For impact resistance | AH130 | 90 - 180 | 0.07 - 0.22 | 0.05 - 0.16 | 0.04 - 0.14 | 0.04 - 0.13 |
| | Tool steels X40CrMoV5-1, etc. | - 300 | First choice | AH725 | 90 - 180 | 0.07 - 0.22 | 0.05 - 0.16 | 0.04 - 0.14 | 0.04 - 0.13 |
| | | - 300 | For impact resistance | AH130 | 90 - 180 | 0.07 - 0.22 | 0.05 - 0.16 | 0.04 - 0.14 | 0.04 - 0.13 |
| M | Stainless steel X5CrNi18-9, etc. | - | - | AH130 | 90 - 200 | 0.07 - 0.22 | 0.05 - 0.16 | 0.04 - 0.14 | 0.04 - 0.13 |
| K | Grey cast irons 250, etc. | 150 - 250 | - | AH120 | 120 - 230 | 0.08 - 0.25 | 0.06 - 0.19 | 0.05 - 0.16 | 0.05 - 0.15 |
| | Ductile cast irons 400-15S, etc. | 150 - 250 | - | AH120 | 90 - 150 | 0.08 - 0.25 | 0.06 - 0.19 | 0.05 - 0.16 | 0.05 - 0.15 |
| S | Titanium alloys Ti-6Al-4V, etc. | - | First choice | AH725 | 30 - 40 | 0.07 - 0.12 | 0.05 - 0.09 | 0.04 - 0.07 | 0.04 - 0.07 |
| | | - | For impact resistance | AH130 | 30 - 40 | 0.07 - 0.12 | 0.05 - 0.09 | 0.04 - 0.07 | 0.04 - 0.07 |
| | Nickel-based alloys Inconel 718, etc. | - | First choice | AH725 | 20 - 35 | 0.07 - 0.12 | 0.05 - 0.09 | 0.04 - 0.07 | 0.04 - 0.07 |
| | | - | For impact resistance | AH130 | 20 - 35 | 0.07 - 0.12 | 0.05 - 0.09 | 0.04 - 0.07 | 0.04 - 0.07 |

# ASW 06/07/09

## Axial drive type slot milling cutter






| Designation | W | øDc | Edge/Z | øDb | ød | Lf | b | a | Max. ae | θ° | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ASW06N080-E10 | 10 | 80 | 4/8 | 41 | 27 | 10 | 29.8 | 7 | 18.5 | 157.5 | WNGU0603... |
| ASW06N100-E10 | 10 | 100 | 5/10 | 47 | 32 | 10 | 34.8 | 8 | 25.5 | 162 | WNGU0603... |
| ASW06N125-E10 | 10 | 125 | 6/12 | 55 | 40 | 10 | 43.5 | 10 | 34 | 165 | WNGU0603... |
| ASW06N160-E10 | 10 | 160 | 7/14 | 55 | 40 | 10 | 43.5 | 10 | 51.5 | 167.14 | WNGU0603... |
| ASW07N100-E12 | 12 | 100 | 5/10 | 47 | 32 | 12 | 34.8 | 8 | 25.5 | 162 | WNGU07T3... |
| ASW07N125-E12 | 12 | 125 | 6/12 | 55 | 40 | 12 | 43.5 | 10 | 34 | 165 | WNGU07T3... |
| ASW07N160-E12 | 12 | 160 | 7/14 | 55 | 40 | 12 | 43.5 | 10 | 51.5 | 167.14 | WNGU07T3... |
| ASW09N100-E14 | 14 | 100 | 5/10 | 47 | 32 | 14 | 34.8 | 8 | 25.5 | 162 | WNGU0904... |
| ASW09N160-E14 | 14 | 160 | 7/14 | 55 | 40 | 14 | 43.5 | 10 | 51.5 | 167.14 | WNGU0904... |
| ASW09N160-E16 | 16 | 160 | 7/14 | 55 | 40 | 16 | 43.5 | 10 | 51.5 | 167.14 | WNGU0904... |

### SPARE PARTS







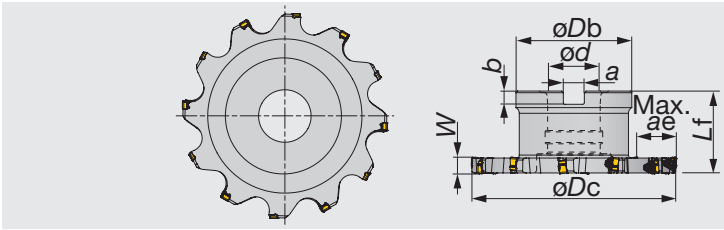


| Designation | Clamping screw | Clamping screw 1 | Grip | Grip 1 | Lubricant | Torx bit | Wrench |
|---|---|---|---|---|---|---|---|
| ASW06N... | - | CSPB-2.5 | - | - | M-1000 | - | IP-8D |
| ASW07N100/125-... | - | CSPD-3 | - | SW6-SD | M-1000 | BLD IP10/S7 | - |
| ASW07N160-... | - | CSPD-3 | - | - | M-1000 | - | IP-10D |
| ASW09N100-... | CSPB-3.5 | - | H-TB2W | - | M-1000 | BLDIP15/S7 | - |
| ASW09N160-... | CSPB-3.5 | - | - | - | M-1000 | - | IP-15D |

# TSW 06/07/09

Radial drive type slot milling cutter






| Designation | W | øDc | Edge/Z | øDb | ød | Lf | b | a | Max. ae | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| TSW06R100-E10 | 10 | 100 | 5/10 | 58 | 27 | 50 | 7 | 12.4 | 20 | WNGU0603... |
| TSW06R125-E10 | 10 | 125 | 6/12 | 66 | 32 | 50 | 8 | 14.4 | 28.5 | WNGU0603... |
| TSW06R160-E10 | 10 | 160 | 7/14 | 82 | 40 | 63 | 9 | 16.4 | 38 | WNGU0603... |
| TSW07R100-E12 | 12 | 100 | 5/10 | 58 | 27 | 50 | 7 | 12.4 | 20 | WNGU07T3... |
| TSW07R125-E12 | 12 | 125 | 6/12 | 66 | 32 | 50 | 8 | 14.4 | 28.5 | WNGU07T3... |
| TSW07R160-E12 | 12 | 160 | 7/14 | 82 | 40 | 63 | 9 | 16.4 | 38 | WNGU07T3... |
| TSW09R160-E16 | 16 | 160 | 7/14 | 82 | 40 | 63 | 9 | 16.4 | 38 | WNGU0904... |

## SPARE PARTS

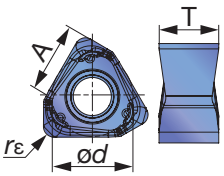
| Designation | Clamping screw | Clamping screw 1 | Grip | Lubricant | Torx bit | Wrench |
|---|---|---|---|---|---|---|
| TSW06R... | - | CSPB-2.5 | - | M-1000 | - | IP-8D |
| TSW07R100/125-... | - | CSPD-3 | SW6-SD | M-1000 | BLD IP10/S7 | - |
| TSW07R160-... | - | CSPD-3 | - | M-1000 | - | IP-10D |
| TSW09R160-... | CSPB-3.5 | - | - | M-1000 | - | IP-15D |



## INSERT

### WNGU-MJ






| | | | | |
|---|---|---|---|---|
| P | Steel | ☆ | | ★ |
| M | Stainless | | ★ | ☆ |
| K | Cast iron | ★ | | ☆ |
| N | Non-ferrous | | | |
| S | Superalloys | ★ | ☆ | ★ |
| H | Hard materials | | | |

★ : First choice
☆ : Second choice

| Designation | rε | Coating AH120 | Coating AH130 | Coating AH725 | A | ød | T |
|---|---|---|---|---|---|---|---|
| WNGU060308TN-MJ | 0.8 | ● | ● | ● | 5.6 | 6.1 | 4.4 |
| WNGU060316TN-MJ | 1.6 | ● | ● | ● | 5.6 | 6.1 | 4.4 |
| WNGU07T308TN-MJ | 0.8 | ● | ● | ● | 6.8 | 7.4 | 5.5 |
| WNGU07T316TN-MJ | 1.6 | ● | ● | ● | 6.8 | 7.4 | 5.5 |
| WNGU090408TN-MJ | 0.8 | ● | ● | ● | 8.5 | 8.6 | 6.5 |
| WNGU090416TN-MJ | 1.6 | ● | ● | ● | 8.5 | 8.6 | 6.5 |

●: Line-up

## STANDARD CUTTING CONDITIONS

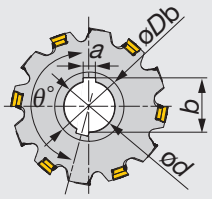
| ISO | Workpiece material | Hardness (HB) | Priority | Grade | Cutting speed *Vc* (m/min) | Feed per edge line: *fz* (mm/t) TSW / ASW ae / ø*Dc* (mm) 10% | 20% | 30% | ≤ 50% |
|---|---|---|---|---|---|---|---|---|---|
| P | Low carbon steels E275A, etc. | - 200 | First choice | AH725 | 90 - 180 | 0.12 - 0.33 | 0.09 - 0.25 | 0.07 - 0.21 | 0.07 - 0.2 |
| | | - 200 | For impact resistance | AH130 | 90 - 180 | 0.12 - 0.33 | 0.09 - 0.25 | 0.07 - 0.21 | 0.07 - 0.2 |
| | High carbon steels C45, etc. | 200 - 300 | First choice | AH725 | 90 - 180 | 0.12 - 0.33 | 0.09 - 0.25 | 0.07 - 0.21 | 0.07 - 0.2 |
| | | 200 - 300 | For impact resistance | AH130 | 90 - 180 | 0.12 - 0.33 | 0.09 - 0.25 | 0.07 - 0.21 | 0.07 - 0.2 |
| | Alloy steels 42CrMo4, etc. | 150 - 300 | First choice | AH725 | 90 - 180 | 0.12 - 0.33 | 0.09 - 0.25 | 0.07 - 0.21 | 0.07 - 0.2 |
| | | 150 - 300 | For impact resistance | AH130 | 90 - 180 | 0.12 - 0.33 | 0.09 - 0.25 | 0.07 - 0.21 | 0.07 - 0.2 |
| | Tool steels X40CrMoV5-1, etc. | - 300 | First choice | AH725 | 90 - 180 | 0.12 - 0.33 | 0.09 - 0.25 | 0.07 - 0.21 | 0.07 - 0.2 |
| | | - 300 | For impact resistance | AH130 | 90 - 180 | 0.12 - 0.33 | 0.09 - 0.25 | 0.07 - 0.21 | 0.07 - 0.2 |
| M | Stainless steel X5CrNi18-9, etc. | - | - | AH130 | 90 - 200 | 0.12 - 0.33 | 0.09 - 0.25 | 0.07 - 0.21 | 0.07 - 0.2 |
| K | Grey cast irons 250, etc. | 150 - 250 | - | AH120 | 120 - 230 | 0.12 - 0.42 | 0.09 - 0.31 | 0.07 - 0.27 | 0.07 - 0.25 |
| | Ductile cast irons 400-15S, etc. | 150 - 250 | - | AH120 | 90 - 150 | 0.12 - 0.42 | 0.09 - 0.31 | 0.07 - 0.27 | 0.07 - 0.25 |
| S | Titanium alloys Ti-6Al-4V, etc. | - | First choice | AH725 | 30 - 40 | 0.1 - 0.17 | 0.08 - 0.13 | 0.06 - 0.11 | 0.06 - 0.1 |
| | | - | For impact resistance | AH130 | 30 - 40 | 0.1 - 0.17 | 0.08 - 0.13 | 0.06 - 0.11 | 0.06 - 0.1 |
| | Nickel-based alloys Inconel 718, etc. | - | First choice | AH725 | 20 - 35 | 0.1 - 0.17 | 0.08 - 0.13 | 0.06 - 0.11 | 0.06 - 0.1 |
| | | - | For impact resistance | AH130 | 20 - 35 | 0.1 - 0.17 | 0.08 - 0.13 | 0.06 - 0.11 | 0.06 - 0.1 |

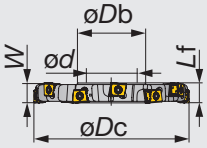
TANGENTIAL TECTSLOT

# ASN 10/12/15

Axial drive type slot milling cutter with tangentially mounted inserts






| Designation | W | øDc | Z eff | z | øDb | ød | Lf | b | a | Max. ae | θ° | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ASN10R100M32.0E16-05 | 16 | 100 | 5 | 10 | 47 | 32 | 16 | 34.8 | 8 | 25.5 | 162 | LMEU1008**ZNEN-MJ |
| ASN10R125M40.0E16-06 | 16 | 125 | 6 | 12 | 55 | 40 | 16 | 43.5 | 10 | 34 | 165 | LMEU1008**ZNEN-MJ |
| ASN10R160M40.0E16-07 | 16 | 160 | 7 | 14 | 55 | 40 | 16 | 43.5 | 10 | 51.5 | 167.14 | LMEU1008**ZNEN-MJ |
| ASN10R200M50.0E16-08 | 16 | 200 | 8 | 16 | 69 | 50 | 16 | 53.6 | 12 | 64.5 | 168.75 | LMEU1008**ZNEN-MJ |
| ASN12R100M32.0E19-05 | 19 | 100 | 5 | 10 | 47 | 32 | 19 | 34.8 | 8 | 25.5 | 162 | LMEU1208**ZNEN-MJ |
| ASN12R125M40.0E19-06 | 19 | 125 | 6 | 12 | 55 | 40 | 19 | 43.5 | 10 | 34 | 165 | LMEU1208**ZNEN-MJ |
| ASN12R160M40.0E19-07 | 19 | 160 | 7 | 14 | 55 | 40 | 19 | 43.5 | 10 | 51.5 | 167.14 | LMEU1208**ZNEN-MJ |
| ASN12R200M50.0E19-08 | 19 | 200 | 8 | 16 | 69 | 50 | 19 | 53.6 | 12 | 64.5 | 168.75 | LMEU1208**ZNEN-MJ |
| ASN12R250M50.0E19-09 | 19 | 250 | 9 | 18 | 84 | 50 | 19 | 53.6 | 12 | 82 | 170 | LMEU1208**ZNEN-MJ |
| ASN15R125M40.0E25-05 | 25 | 125 | 5 | 10 | 55 | 40 | 25 | 43.5 | 10 | 34 | 165 | LMEU1509**ZNEN-MJ |
| ASN15R160M40.0E25-06 | 25 | 160 | 6 | 12 | 55 | 40 | 25 | 43.5 | 10 | 51.5 | 167.14 | LMEU1509**ZNEN-MJ |
| ASN15R200M50.0E25-07 | 25 | 200 | 7 | 14 | 69 | 50 | 25 | 53.6 | 12 | 64.5 | 168.75 | LMEU1509**ZNEN-MJ |
| ASN15R250M50.0E25-08 | 25 | 250 | 8 | 16 | 84 | 50 | 25 | 53.6 | 12 | 82 | 170 | LMEU1509**ZNEN-MJ |

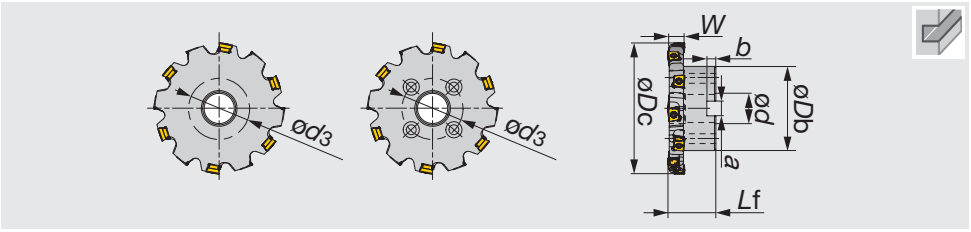
## SPARE PARTS

| Designation | Clamping screw | Grip | Torx bit |
|---|---|---|---|
| ASN10/12R... | SM40-143-H0 | H-TB | BT15S |
| ASN15R... | CSTB-5L159 | H-TB | BT20S |

## TSN

Radial drive type slot milling cutter with tangentially mounted inserts






| Designation | W | øDc | Z eff | z | øDb | ød | Lf | b | a | Max. ae | ød3 | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TSN10R100M27.0E16-05 | 16 | 100 | 5 | 10 | 58 | 27 | 50 | 7 | 12.4 | 20 | - | LMEU1008**ZNEN-MJ |
| TSN10R125M32.0E16-06 | 16 | 125 | 6 | 12 | 66 | 32 | 50 | 8 | 14.4 | 28.5 | - | LMEU1008**ZNEN-MJ |
| TSN10R160M40.0E16-07 | 16 | 160 | 7 | 14 | 82 | 40 | 63 | 9 | 16.4 | 38 | - | LMEU1008**ZNEN-MJ |
| TSN10R200M40.0E16-08 | 16 | 200 | 8 | 16 | 95 | 40 | 63 | 9 | 16.4 | 55 | 66.7 | LMEU1008**ZNEN-MJ |
| TSN12R100M27.0E19-05 | 19 | 100 | 5 | 10 | 58 | 27 | 50 | 7 | 12.4 | 20 | - | LMEU1208**ZNEN-MJ |
| TSN12R125M32.0E19-06 | 19 | 125 | 6 | 12 | 66 | 32 | 50 | 8 | 14.4 | 28.5 | - | LMEU1208**ZNEN-MJ |
| TSN12R160M40.0E19-07 | 19 | 160 | 7 | 14 | 82 | 40 | 63 | 9 | 16.4 | 38 | - | LMEU1208**ZNEN-MJ |
| TSN12R200M40.0E19-08 | 19 | 200 | 8 | 16 | 95 | 40 | 63 | 9 | 16.4 | 55 | 66.7 | LMEU1208**ZNEN-MJ |
| TSN12R250M60.0E19-09 | 19 | 250 | 9 | 18 | 135 | 60 | 63 | 14 | 25.7 | 60 | 101.6 | LMEU1208**ZNEN-MJ |
| TSN15R125M32.0E25-05 | 25 | 125 | 5 | 10 | 66 | 32 | 50 | 8 | 14.4 | 28.5 | - | LMEU1509**ZNEN-MJ |
| TSN15R160M40.0E25-06 | 25 | 160 | 6 | 12 | 82 | 40 | 63 | 9 | 16.4 | 38 | - | LMEU1509**ZNEN-MJ |
| TSN15R200M40.0E25-07 | 25 | 200 | 7 | 14 | 95 | 40 | 63 | 9 | 16.4 | 55 | 66.7 | LMEU1509**ZNEN-MJ |
| TSN15R250M60.0E25-08 | 25 | 250 | 8 | 16 | 135 | 60 | 63 | 14 | 25.7 | 60 | 101.6 | LMEU1509**ZNEN-MJ |

### SPARE PARTS



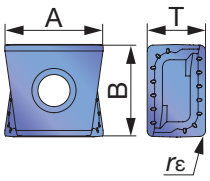


| Designation | Clamping screw | Grip | Torx bit |
|---|---|---|---|
| TSN10/12R... | SM40-143-H0 | H-TB | BT15S |
| TSN15R... | CSTB-5L159 | H-TB | BT20S |

## INSERT

### LMEU-MJ






| | | | | | |
|---|---|---|---|---|---|
| P | Steel | ☆ | | ★ | |
| M | Stainless | | ★ | ☆ | |
| K | Cast iron | ★ | | ☆ | |
| N | Non-ferrous | | | | |
| S | Superalloys | ★ | | ★ | |
| H | Hard materials | | | | |

★ : First choice
☆ : Second choice

| Designation | rε | Coating | | | A | B | T |
|---|---|---|---|---|---|---|---|
| | | AH120 | AH140 | AH725 | | | |
| LMEU100808ZNEN-MJ | 0.8 | ● | ● | ● | 12.7 | 10.5 | 8 |
| LMEU100816ZNEN-MJ | 1.6 | ● | ● | ● | 12.5 | 10.5 | 8 |
| LMEU100824ZNEN-MJ | 2.4 | ● | ● | ● | 12.4 | 10.5 | 8 |
| LMEU100832ZNEN-MJ | 3.2 | ● | ● | ● | 12.2 | 10.5 | 8 |
| LMEU120808ZNEN-MJ | 0.8 | ● | ● | ● | 13.6 | 12.7 | 8 |
| LMEU120816ZNEN-MJ | 1.6 | ● | ● | ● | 13.4 | 12.7 | 8 |
| LMEU120824ZNEN-MJ | 2.4 | ● | ● | ● | 13.2 | 12.7 | 8 |
| LMEU120832ZNEN-MJ | 3.2 | ● | ● | ● | 13.1 | 12.7 | 8 |
| LMEU150908ZNEN-MJ | 0.8 | ● | ● | ● | 15.6 | 15 | 9.5 |
| LMEU150916ZNEN-MJ | 1.6 | ● | ● | ● | 15.4 | 15 | 9.5 |
| LMEU150924ZNEN-MJ | 2.4 | ● | ● | ● | 15.3 | 15 | 9.5 |
| LMEU150932ZNEN-MJ | 3.2 | ● | ● | ● | 15.1 | 15 | 9.5 |

●: Line-up



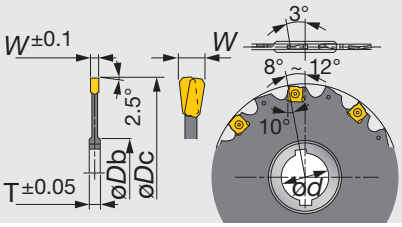
## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Hardness (HB) | Priority | Grade | Cutting speed *Vc* (m/min) | Feed per edge line: *fz* (mm/t) TSN / ASN ae / ø*Dc* (mm) 10% | 20% | 30% | ≤ 50% |
|---|---|---|---|---|---|---|---|---|---|
| P | Low carbon steels E275A, etc. | - 200 | First choice | AH725 | 90 - 180 | 0.22 - 0.42 | 0.16 - 0.31 | 0.14 - 0.27 | 0.13 - 0.25 |
| | | - 200 | For impact resistance | AH140 | 90 - 180 | 0.22 - 0.42 | 0.16 - 0.31 | 0.14 - 0.27 | 0.13 - 0.25 |
| | High carbon steels C45, etc. | 200 - 300 | First choice | AH725 | 90 - 180 | 0.22 - 0.42 | 0.16 - 0.31 | 0.14 - 0.27 | 0.13 - 0.25 |
| | | 200 - 300 | For impact resistance | AH140 | 90 - 180 | 0.22 - 0.42 | 0.16 - 0.31 | 0.14 - 0.27 | 0.13 - 0.25 |
| | Alloy steels 42CrMo4, etc. | 150 - 300 | First choice | AH725 | 90 - 180 | 0.22 - 0.42 | 0.16 - 0.31 | 0.14 - 0.27 | 0.13 - 0.25 |
| | | 150 - 300 | For impact resistance | AH140 | 90 - 180 | 0.22 - 0.42 | 0.16 - 0.31 | 0.14 - 0.27 | 0.13 - 0.25 |
| | Tool steels X40CrMoV5-1, etc. | - 300 | First choice | AH725 | 90 - 180 | 0.22 - 0.42 | 0.16 - 0.31 | 0.14 - 0.27 | 0.13 - 0.25 |
| | | - 300 | For impact resistance | AH140 | 90 - 180 | 0.22 - 0.42 | 0.16 - 0.31 | 0.14 - 0.27 | 0.13 - 0.25 |
| M | Stainless steel X5CrNi18-9, etc. | - | - | AH140 | 90 - 200 | 0.22 - 0.42 | 0.16 - 0.31 | 0.14 - 0.27 | 0.13 - 0.25 |
| K | Grey cast irons 250, etc. | 150 - 250 | - | AH120 | 120 - 230 | 0.22 - 0.5 | 0.16 - 0.38 | 0.14 - 0.32 | 0.13 - 0.3 |
| | Ductile cast irons 400-15S, etc. | 150 - 250 | - | AH120 | 90 - 150 | 0.22 - 0.33 | 0.16 - 0.25 | 0.14 - 0.21 | 0.13 - 0.2 |
| S | Titanium alloys Ti-6Al-4V, etc. | - | First choice | AH725 | 30 - 40 | 0.12 - 0.22 | 0.09 - 0.16 | 0.07 - 0.14 | 0.07 - 0.13 |
| | Nickel-based alloys Inconel 718, etc. | - | First choice | AH725 | 20 - 35 | 0.12 - 0.22 | 0.09 - 0.16 | 0.07 - 0.14 | 0.07 - 0.13 |

## SVN4000

Indexable side slotting cutter for 5 - 8 mm width






| Designation | øDc | W | Edge/z | ød | øDb | T | Insert |
|---|---|---|---|---|---|---|---|
| SVN4100-5M | 100 | 5 | 2/10 | 32 | 48 | 8 | SNEN12T2... |
| SVN4100-6M | 100 | 6 | 2/10 | 32 | 48 | 10 | SNEN1233... |
| SVN4100-8M | 100 | 8 | 4/8 | 32 | 48 | 12 | SNEN1233... |
| SVN4125-5M | 125 | 5 | 2/12 | 32 | 48 | 8 | SNEN12T2... |
| SVN4125-6M | 125 | 6 | 2/12 | 32 | 48 | 10 | SNEN1233... |
| SVN4125-8M | 125 | 8 | 4/12 | 32 | 48 | 12 | SNEN1233... |
| SVN4160-5M | 160 | 5 | 2/16 | 40 | 58 | 8 | SNEN12T2... |
| SVN4160-6M | 160 | 6 | 2/16 | 40 | 58 | 10 | SNEN1233... |
| SVN4160-8M | 160 | 8 | 4/16 | 40 | 58 | 12 | SNEN1233... |
| SVN4200-5M | 200 | 5 | 2/20 | 40 | 68 | 8 | SNEN12T2... |
| SVN4200-6M | 200 | 6 | 2/20 | 40 | 68 | 10 | SNEN1233... |
| SVN4200-8M | 200 | 8 | 4/20 | 40 | 68 | 12 | SNEN1233... |

### SPARE PARTS

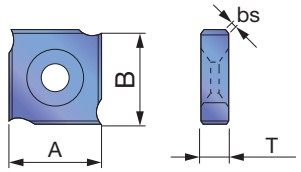



| Designation | Clamping screw | Wrench |
|---|---|---|
| SVN4100-5M | CST-3.5S | T-9D |
| SVN4100-6/8M | CST-3.5 | T-9D |
| SVN4125-5M | CST-3.5S | T-9D |
| SVN4125-6/8M | CST-3.5 | T-9D |
| SVN4160-5M | CST-3.5S | T-9D |
| SVN4160-6/8M | CST-3.5 | T-9D |
| SVN4200-5M | CST-3.5S | T-9D |
| SVN4200-6/8M | CST-3.5 | T-9D |

● Notes on specifications of specials made to order
① The cutter widths (ℓ) are available in a range from 5 mm to 12 mm.
② The maximum cutter diameter available is ø960 mm.
③ Special mounting specifications are also available on request.

## INSERT

### SNEN12




| | | UX30 | TH10 | | A | B | T | bs | Honing |
|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ★ | | | | | | | |
| M | Stainless | | | | | | | | |
| K | Cast iron | | ★ | | | | | | |
| N | Non-ferrous | | ★ | | | | | | |
| S | Superalloys | | | | | | | | |
| H | Hard materials | | | | | | | | |
| Designation | | Uncoated | | | | | | | |
| SNEN12T2ZFN | | | ● | | 12.7 | 12.7 | 2.8 | 0.15 | without |
| SNEN12T2ZTN | | ● | | | 12.7 | 12.7 | 2.8 | 0.15 | with |
| SNEN1233ZFN | | | ● | | 12.7 | 12.7 | 3.3 | 0.15 | without |
| SNEN1233ZTN | | ● | | | 12.7 | 12.7 | 3.3 | 0.15 | with |

★ : First choice
☆ : Second choice

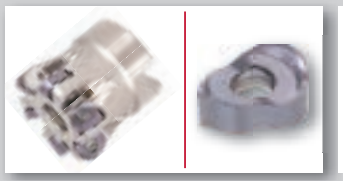
●: Line-up

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Grade | Cutting speed *Vc* (m/min) |
|---|---|---|---|
| P | Carbon steels < 300 HB | UX30 | 80 ~ 120 |
| | Die steels < 300 HB | UX30 | 60 ~ 80 |
| K | Cast irons | TH10 | 80 ~ 100 |
| N | Aluminium alloys | TH10 | 600 ~ 1000 |

Note: SVN4000 type TAC mills should be used only for roughing. Attainable accuracy of groove width is ±0.1 mm.
- No. of revolutions $n$ (min$^{-1}$) = Cutting speed $Vc$ (m/min) × 1000 ÷ 3.14 ÷ Cutter ø (mm)
- Feed speed $Vf$ (mm/min) = $n$ (min$^{-1}$) × Feed per tooth $fz$ (mm/t) × z (No. of inserts)

MEMO

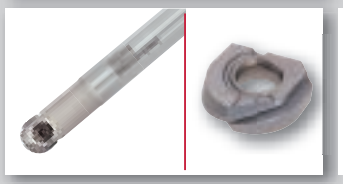


## DO TWIST BALL
D016

Radius cutters with double-sided inserts with rigid clamping

ø20 - ø50 mm
max. ap 4 mm

P M K N S H

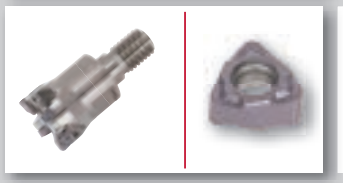


## BALL FINISH NOSE
D190

Indexable endmill for high-precision finishing with 2 effective cutting edges

ø8 - ø32 mm

P M K N H



## DO M INI MILL
D195

Double-sided positive inserts for finishing to semi-finishing in profiling operations

ø16 - ø25 mm
max. ap 1 mm

P H

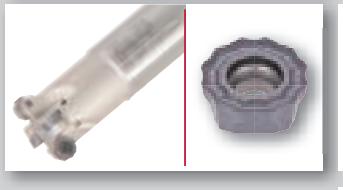


## FIXR MILL
D196

Radius cutters with single-sided inserts for profile milling of complex parts

ø20 - ø66 mm
max. ap 8 mm

P M K H



## ROUNDSPLIT
D201

Radius cutters featuring single-sided inserts with serrated cutting edges for anti-chatter

ø32 - ø125 mm
max. ap 8 mm

P M K N S

## Other radius mills
D206

T/ERD12/16, E/HWD

P M K H

## Single Effective Tools - Ball Cutters
D212

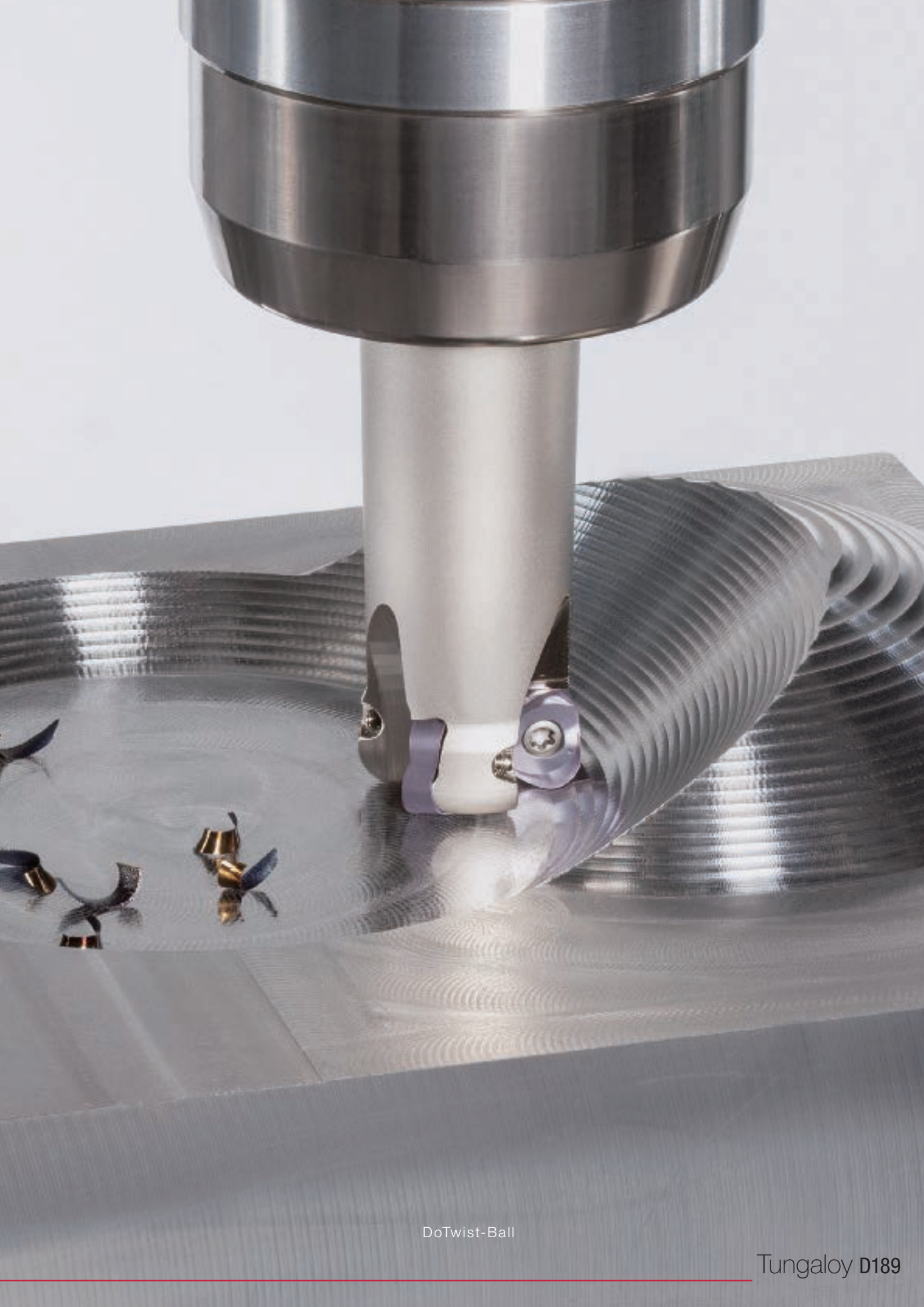
TBN1000, EBP, EBB, EBD, BBB

P K H

## Z-FEEDMILL
D220

Z-direction plunging tools for high metal removal

P K H



DoTwist-Ball

# EBFM

Indexable endmills for high precision finish



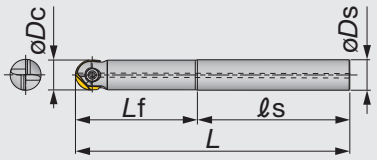



Fig. 1

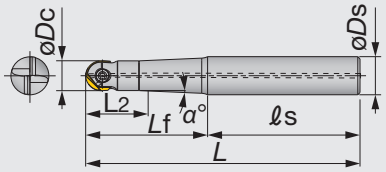
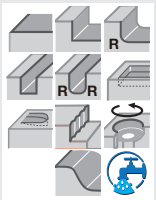



Fig. 2




| Designation | Material | øDc | øDs | ℓs | Lf | L | L2 | α° | Air hole | Fig | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| EBFM08T12S100 | Steel | 8 | 12 | 80 | 20 | 100 | 10 | 9.5 | with | 2 | ZF*M080... |
| EBFM08S08C100 | Carbide | 8 | 8 | 70 | 30 | 100 | - | - | without | 1 | ZF*M080... |
| EBFM08S08C140 | Carbide | 8 | 8 | 75 | 65 | 140 | - | - | without | 1 | ZF*M080... |
| EBFM10T12S100 | Steel | 10 | 12 | 75 | 25 | 100 | 15 | 5 | with | 2 | ZF*M100... |
| EBFM10S10C140 | Carbide | 10 | 10 | 65 | 75 | 140 | - | - | without | 1 | ZF*M100... |
| EBFM10S10C220 | Carbide | 10 | 10 | 80 | 140 | 220 | - | - | without | 1 | ZF*M100... |
| EBFM12S12S110 | Steel | 12 | 12 | 80 | 30 | 110 | - | - | with | 1 | ZF*M120... |
| EBFM12S12C160 | Carbide | 12 | 12 | 70 | 90 | 160 | - | - | without | 1 | ZF*M120... |
| EBFM12S12C220 | Carbide | 12 | 12 | 70 | 150 | 220 | - | - | without | 1 | ZF*M120... |
| EBFM16T20S130 | Steel | 16 | 20 | 80 | 50 | 130 | 15.5 | 1.5 | with | 2 | ZF*M160... |
| EBFM16S16C160 | Carbide | 16 | 16 | 80 | 80 | 160 | - | - | without | 1 | ZF*M160... |
| EBFM16S16C220 | Carbide | 16 | 16 | 70 | 150 | 220 | - | - | without | 1 | ZF*M160... |
| EBFM20T25S180 | Steel | 20 | 25 | 100 | 80 | 180 | 24 | 2.5 | with | 2 | ZF*M200... |
| EBFM20S20C220 | Carbide | 20 | 20 | 100 | 120 | 220 | - | - | without | 1 | ZF*M200... |
| EBFM20S20C300 | Carbide | 20 | 20 | 80 | 220 | 300 | - | - | without | 1 | ZF*M200... |
| EBFM25T32S200 | Steel | 25 | 32 | 100 | 100 | 200 | 32 | 1.5 | with | 2 | ZF*M250... |
| EBFM25S25C220 | Carbide | 25 | 25 | 100 | 120 | 220 | - | - | without | 1 | ZF*M250... |
| EBFM25S25C300 | Carbide | 25 | 25 | 80 | 220 | 300 | - | - | without | 1 | ZF*M250... |
| EBFM30T32S220 | Steel | 30 | 32 | 120 | 100 | 220 | 35 | 0.5 | with | 2 | ZF*M300... |
| EBFM30S32C250 | Carbide | 30 | 32 | 100 | 150 | 250 | - | - | without | 1 | ZF*M300... |
| EBFM30S32C350 | Carbide | 30 | 32 | 100 | 250 | 350 | - | - | without | 1 | ZF*M300... |
| EBFM32S32S250 | Steel | 32 | 32 | 150 | 100 | 250 | - | - | with | 1 | ZF*M320... |
| EBFM32S32C300 | Carbide | 32 | 32 | 80 | 220 | 300 | - | - | without | 1 | ZF*M320... |

## SPARE PARTS

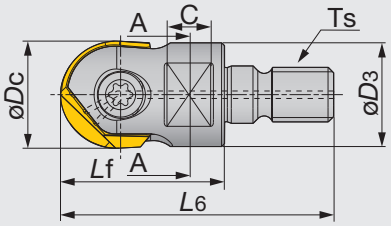
| Designation | Clamping screw | Torx bit | Grip | Wrench |
|---|---|---|---|---|
| EBFM08... | TS 25F080A | - | - | T-8D |
| EBFM10... | TS 30F100A | - | - | T-10D |
| EBFM12... | TS 40F120A | - | - | T-15D |
| EBFM16... | TS 50F160A | BT20S | H-TB2W | - |
| EBFM20... | TS 60F200A | BLDT25/M7 | H-TB2W | - |
| EBFM25... | TS 70F250A | BLDT25/M7 | H-TB2W | - |
| EBFM30... | TS 80F300A | - | - | T-T30 |
| EBFM32... | TS 80F300A | - | - | T-T30 |

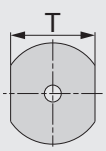
# BALL FINISH NOSE

## HBFM

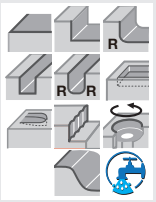
Indexable endmills with TungFlex threaded adaptation for high precision finish






A - A cross section




| Designation | øDc | L6 | Lf | C | T | øD3 | Ts | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|
| HBFM10M06 | 10 | 34.5 | 20 | 5 | 7 | 9.7 | M6 | with | ZF*M100... |
| HBFM12M06 | 12 | 37.5 | 23 | 5 | 7 | 11.5 | M6 | with | ZF*M120... |
| HBFM12M08 | 12 | 40 | 23 | 8 | 10 | 13 | M8 | with | ZF*M120... |
| HBFM16M08 | 16 | 47 | 30 | 8 | 10 | 13 | M8 | with | ZF*M160... |
| HBFM20M10 | 20 | 49 | 30 | 10 | 15 | 19 | M10 | with | ZF*M200... |
| HBFM25M12 | 25 | 57 | 35 | 10 | 17 | 24 | M12 | with | ZF*M250... |
| HBFM30M16 | 30 | 66 | 43 | 12 | 22 | 29 | M16 | with | ZF*M300... |
| HBFM32M16 | 32 | 66 | 43 | 12 | 22 | 29.5 | M16 | with | ZF*M320... |

### SPARE PARTS



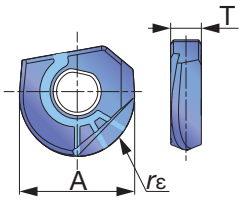



| Designation | Clamping screw | Torx bit | Grip | Wrench |
|---|---|---|---|---|
| HBFM10... | TS 30F100A | - | - | T-10D |
| HBFM12... | TS 40F120A | - | - | T-15D |
| HBFM16... | TS 50F160A | BT20S | H-TB2W | - |
| HBFM20... | TS 60F200A | BLDT25/M7 | H-TB2W | - |
| HBFM25... | TS 70F250A | BLDT25/M7 | H-TB2W | - |
| HBFM30... | TS 80F300A | - | - | T-T30 |
| HBFM32... | TS 80F300A | - | - | T-T30 |

## INSERT

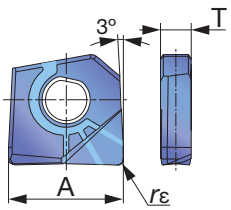
### ZFBM-MJ






### ZFRM-MJ






| | | | |
|---|---|---|---|
| P | Steel | ☆ | ★ |
| M | Stainless | | ☆ |
| K | Cast iron | ★ | ☆ |
| N | Non-ferrous | | ☆ |
| S | Superalloys | | ★ |
| H | Hard materials | ★ | ☆ |

★ : First choice
☆ : Second choice

| Designation | rε | Coating | | A | T |
|---|---|---|---|---|---|
| | | AH710 | AH725 | | |
| ZFBM080R00-MJ | 4 | ● | ● | 8 | 2.4 |
| ZFBM100R00-MJ | 5 | ● | ● | 10 | 2.9 |
| ZFBM120R00-MJ | 6 | ● | ● | 12 | 3.4 |
| ZFBM160R00-MJ | 8 | ● | ● | 16 | 4.4 |
| ZFBM200R00-MJ | 10 | ● | ● | 20 | 5.4 |
| ZFBM250R00-MJ | 12.5 | ● | ● | 25 | 6.4 |
| ZFBM300R00-MJ | 15 | ● | ● | 30 | 7.4 |
| ZFBM320R00-MJ | 16 | ● | ● | 32 | 7.4 |
| ZFRM120R05-MJ | 0.5 | ● | ● | 12 | 3.4 |
| ZFRM120R10-MJ | 1 | ● | ● | 12 | 3.4 |
| ZFRM160R05-MJ | 0.5 | ● | ● | 16 | 4.4 |
| ZFRM160R10-MJ | 1 | ● | ● | 16 | 4.4 |
| ZFRM160R15-MJ | 1.5 | ● | ● | 16 | 4.4 |
| ZFRM200R10-MJ | 1 | ● | ● | 20 | 5.4 |
| ZFRM200R15-MJ | 1.5 | ● | ● | 20 | 5.4 |

●: Line-up

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Hardness | Priority | Grade | Max. depth of cut (mm) | Cutting speed *Vc* (m/min) | Feed per tooth: *fz* (mm/t) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | D8 | D10 | D12 | D16 | D20 | D25 | D30 | D32 |
| P | Low carbon steel, alloy steel | 85 - 180 HB | First choice | AH725 | ≤ 0.04D | 180 - 260 | 0.15 | 0.2 | 0.2 | 0.25 | 0.25 | 0.3 | 0.35 | 0.35 |
| | | 85 - 180 HB | For wear resistance | AH710 | ≤ 0.04D | 180 - 260 | 0.15 | 0.2 | 0.2 | 0.25 | 0.25 | 0.3 | 0.35 | 0.35 |
| | High carbon steel, alloy steel | 180 - 280 HB | First choice | AH725 | ≤ 0.03D | 150 - 230 | 0.15 | 0.2 | 0.2 | 0.25 | 0.25 | 0.3 | 0.35 | 0.35 |
| | | 180 - 280 HB | For wear resistance | AH710 | ≤ 0.03D | 180 - 230 | 0.15 | 0.2 | 0.2 | 0.25 | 0.25 | 0.3 | 0.35 | 0.35 |
| | Prehardened steel Die & mold tool steel | 40 - 48 HRC | First choice | AH710 | ≤ 0.03D | 180 - 300 | 0.15 | 0.15 | 0.2 | 0.2 | 0.25 | 0.25 | 0.3 | 0.3 |
| | | 40 - 48 HRC | For fracture resistance | AH725 | ≤ 0.03D | 180 - 300 | 0.15 | 0.15 | 0.2 | 0.2 | 0.25 | 0.25 | 0.3 | 0.3 |
| M | Stainless steel | 135 - 200 HB | First choice | AH725 | ≤ 0.03D | 100 - 250 | 0.1 | 0.15 | 0.2 | 0.2 | 0.25 | 0.25 | 0.3 | 0.3 |
| K | Cast iron | 150 - 240 HB | First choice | AH710 | ≤ 0.04D | 90 - 350 | 0.2 | 0.2 | 0.25 | 0.3 | 0.3 | 0.35 | 0.4 | 0.4 |
| | | 150 - 240 HB | For fracture resistance | AH725 | ≤ 0.04D | 90 - 350 | 0.2 | 0.2 | 0.25 | 0.3 | 0.3 | 0.35 | 0.4 | 0.4 |
| N | Aluminium | - | First choice | AH725 | ≤ 0.03D | 200 - 400 | 0.25 | 0.25 | 0.35 | 0.35 | 0.35 | 0.4 | 0.4 | 0.45 |
| H | High hardened steel | 48 - 65 HRC | First choice | AH710 | ≤ 0.02D | 100 - 350 | 0.08 | 0.08 | 0.1 | 0.13 | 0.15 | 0.2 | 0.2 | 0.25 |

· Remove excessive chip accumulation with an air blast.
· For the operation with depth of cut which varies (ex.casting skin) and machining of workpiece materials with interrupted surface, the feed per tooth (*fz*) should be set to the lower recommended value shown in the above table.
· Cutting conditions maybe limited depending on machine power, workpiece rigidity, and spindle output. When the cutting width, depth, or overhang length is large, set *Vc* and *fz* to the lower recommended values and check the machine power and vibration.

### How to clamp the insert

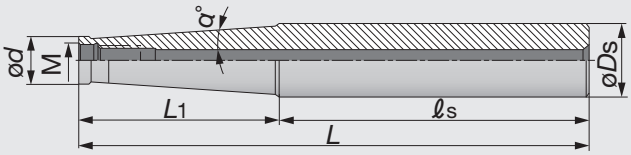
1. Clear chips and dust from the pocket.
2. Place the insert in the pocket. The insert can be placed only in one direction.
3. Tighten the screw while pressing the insert into the pocket.

### How to check the run-out

1. Clamp the insert on the shank.
2. Clamp the shank on a high-precision arbor.
3. Measure the run-out on tool presetter or by dial gauge.

Notes:
1. Due to the helical cutting edge, it is important that the run-out is inspected with the insert clamped on the shank.
2. Do not use micrometer or caliper to inspect the insert diameter as inaccurate dimensions may be provided.



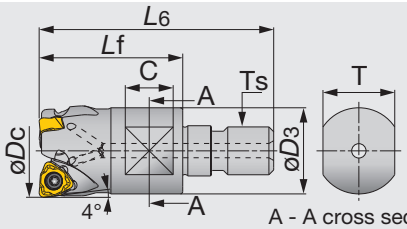


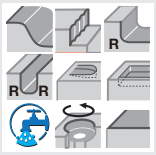

| Designation | øDs | L | ℓs | L1 | ød | M | α° | Shank type |
|---|---|---|---|---|---|---|---|---|
| SM06-L60C10 | 10 | 60 | 40 | 20 | 9.7 | M6 | 0 | Cylindrical |
| SM06-L125-C12 | 12 | 105 | 45 | 60 | 9.7 | M6 | 1.2 | Cylindrical |
| SM06-L125-C16 | 16 | 125 | 65 | 60 | 9.7 | M6 | 3.3 | Cylindrical |
| SM08-L73C16 | 16 | 73 | 48 | 25 | 13 | M8 | 0 | Cylindrical |
| SM08-L128-C16 | 16 | 128 | 48 | 80 | 13 | M8 | 0.9 | Cylindrical |
| SM08-L170-C20 | 20 | 170 | 103.2 | 66.8 | 13 | M8 | 3.3 | Cylindrical |
| SM10-L80-C20 | 20 | 80 | 50 | 30 | 18 | M10 | 0 | Cylindrical |
| SM10-L130-C20 | 20 | 130 | 50 | 80 | 18 | M10 | 0.6 | Cylindrical |
| SM10-L200-C25 | 25 | 200 | 142.8 | 57.2 | 19 | M10 | 3.3 | Cylindrical |
| SM12-L86-C25 | 25 | 86 | 56 | 30 | 21 | M12 | 5.1 | Cylindrical |
| SM12-L200-C32 | 32 | 200 | 122 | 78 | 21 | M12 | 4.4 | Cylindrical |
| SM16-L95-C32 | 32 | 95 | 60 | 35 | 29 | M16 | 1.7 | Cylindrical |
| SM16-L230-C32 | 32 | 230 | 180 | 50 | 29 | M16 | 1.8 | Cylindrical |

# HFWX04-M

Small-radius cutter for finishing operation; Modular head with TungFlex threaded adaptation





| Designation | øDc | z | L6 | Lf | C | T | øD3 | Ts | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| HFWX04M016M08R02 | 16 | 2 | 42 | 25 | 8 | 10 | 13 | M8 | 0.03 | with | WXHU04... |
| HFWX04M020M10R03 | 20 | 3 | 49 | 30 | 10 | 15 | 18 | M10 | 0.05 | with | WXHU04... |
| HFWX04M025M12R04 | 25 | 4 | 52 | 30 | 10 | 17 | 21 | M12 | 0.09 | with | WXHU04... |

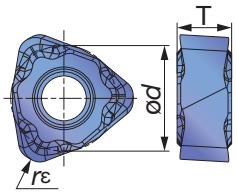
**SPARE PARTS**

| Designation | Clamping screw | Lubricant | Wrench |
|---|---|---|---|
| HFWX04M... | SR34-514 | M-1000 | T-7F |

## INSERT

### WXHU-MJ






| | | | |
|---|---|---|---|
| P | Steel | ★ | |
| M | Stainless | | |
| K | Cast iron | | |
| N | Non-ferrous | | |
| S | Superalloys | | |
| H | Hard materials | ★ | |

★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | Coating AH110 | ød | T |
|---|---|---|---|---|---|
| WXHU040305R-MJ | 0.5 | 0.5 | ● | 6.35 | 3.18 |
| WXHU040310R-MJ | 1 | 1 | ● | 6.35 | 3.18 |

* For plunging, width up to 2 mm is possible.

●: Line-up

## STANDARD CUTTING CONDITIONS

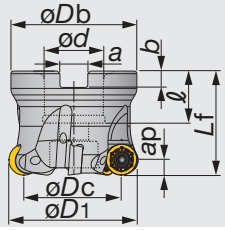
| ISO | Workpiece material | | Hardness | Grade | Cutting speed Vc (m/min) | Feed per tooth fz (mm/t) |
|---|---|---|---|---|---|---|
| P | High carbon steel C45, C55, etc. | | 200 - 300 HB | AH110 | 100 - 300 | 0.1 - 0.3 |
| P | Alloy steel 42CrMo4, SCr145, etc. | | 150 - 300 HB | AH110 | 100 - 300 | 0.1 - 0.3 |
| P | Prehardened steel NAK80, PX5, etc. | | 30 - 40 HRC | AH110 | 100 - 300 | 0.05 - 0.3 |
| H | Hardened steel | X40CrMoV5-1, etc. | 40 - 50 HRC | AH110 | 80 - 130 | 0.1 - 0.3 |
| H | Hardened steel | X153CrMoV12, etc. | 50 - 60 HRC | AH110 | 50 - 100 | 0.05 - 0.15 |

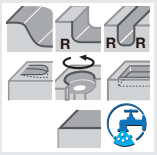
## FIXRMILL
### TRP10/12/16

Radius cutter series bore type with anti-rotation system

A.R. = +4°, R.R. = -4°





| Designation | Max. ap | øDc | z | øD1 | øDb | ød | ℓ | Lf | b | a | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TRP10R040M16.0E05 | 5 | 30 | 5 | 40 | 35 | 16 | 18 | 40 | 5.6 | 8.4 | 0.2 | with | RPMT10T3... |
| TRP12R050M22.0E05 | 6 | 38 | 5 | 50 | 47 | 22 | 20 | 40 | 6.3 | 10.4 | 0.3 | with | RPMT1204... |
| TRP12R052M22.0E05 | 6 | 40 | 5 | 52 | 49 | 22 | 20 | 40 | 6.3 | 10.4 | 0.3 | with | RPMT1204... |
| TRP12R063M22.0E06 | 6 | 51 | 6 | 63 | 59 | 22 | 20 | 40 | 6.3 | 10.4 | 0.6 | with | RPMT1204... |
| TRP12R066M27.0E06 | 6 | 54 | 6 | 66 | 62 | 27 | 22 | 40 | 7 | 12.4 | 0.6 | with | RPMT1204... |
| TRP16R063M22.0E05 | 8 | 47 | 5 | 63 | 59 | 22 | 20 | 40 | 6.3 | 10.4 | 0.6 | with | RPMT1606... |
| TRP16R066M27.0E05 | 8 | 50 | 5 | 66 | 62 | 27 | 22 | 40 | 7 | 12.4 | 0.7 | with | RPMT1606... |

SPARE PARTS

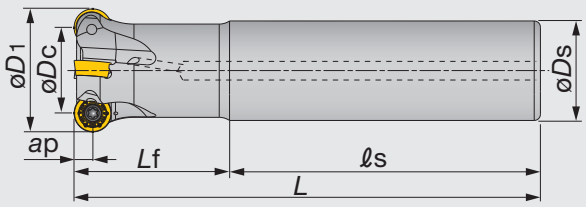
| Designation | Clamping screw | Grip | Lubricant | Shell locking bolt | Torx bit |
|---|---|---|---|---|---|
| TRP10R040M16.0E05 | CSPB-3.5S | H-TBS | M-1000 | FSHM8-30H | BLDIP15/S7 |
| TRP12R050 - 063M22.0... | CSTR-4L100 | H-TBS | M-1000 | CM10X30H | BT15S |
| TRP12R066M27.0E06 | CSTR-4L100 | H-TBS | M-1000 | CM12X30H | BT15S |
| TRP16R063M22.0E05 | CSPB-5 | H-TBS | M-1000 | CM10X30H | BLDIP20/S7 |
| TRP16R066M27.0E05 | CSPB-5 | H-TBS | M-1000 | CM12X30H | BLDIP20/S7 |

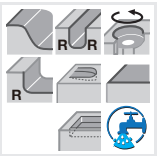
## FIXRMILL
### ERP10/12/16

Radius cutter series shank type with anti-rotation system

A.R. = +10°~ +4°, R.R. = -2°~ -8.5°





| Designation | Max. ap | øDc | z | øD1 | øDs | ℓs | Lf | L | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| ERP10R020M20.0-02 | 5 | 10 | 2 | 20 | 20 | 100 | 50 | 150 | with | RPMT10T3... |
| ERP10R025M25.0-02 | 5 | 15 | 2 | 25 | 25 | 90 | 60 | 150 | with | RPMT10T3... |
| ERP10R032M32.0-04 | 5 | 22 | 4 | 32 | 32 | 80 | 70 | 150 | with | RPMT10T3... |
| ERP10R035M32.0-04 | 5 | 25 | 4 | 35 | 32 | 100 | 50 | 150 | with | RPMT10T3... |
| ERP12R025M25.0-02 | 6 | 13 | 2 | 25 | 25 | 100 | 50 | 150 | with | RPMT1204... |
| ERP12R032M32.0-03 | 6 | 20 | 3 | 32 | 32 | 100 | 50 | 150 | with | RPMT1204... |
| ERP12R040M32.0-04 | 6 | 28 | 4 | 40 | 32 | 100 | 50 | 150 | with | RPMT1204... |
| ERP16R040M32.0-02 | 8 | 24 | 2 | 40 | 32 | 100 | 50 | 150 | with | RPMT1606... |

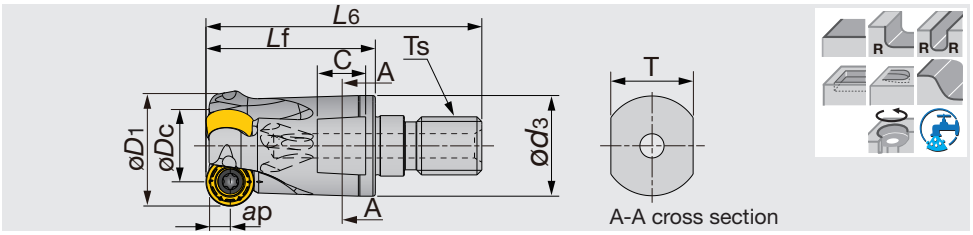
SPARE PARTS

| Designation | Clamping screw | Lubricant | Wrench |
|---|---|---|---|
| ERP10R... | CSPB-3.5S | M-1000 | IP-15D |
| ERP12R... | CSTR-4L100 | M-1000 | T-15DB |
| ERP16R... | CSPB-5 | M-1000 | IP-20D |

Radius cutter series modular type (TungFlex) with anti-rotation system

A.R. = 1°~ 4°, R.R. = -8.5°~ 2°





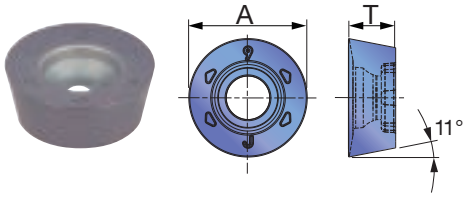

| Designation | Max. ap | øDc | z | øD1 | L6 | Lf | C | T | øD3 | Ts | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HRP10R020MM10-02 | 5 | 10 | 2 | 20 | 49 | 30 | 10 | 15 | 17.8 | M10 | 0.1 | with | RPMT10T3... |
| HRP10R025MM12-02 | 5 | 15 | 2 | 25 | 57 | 35 | 10 | 17 | 20.8 | M12 | 0.1 | with | RPMT10T3... |
| HRP10R032MM16-04 | 5 | 22 | 4 | 32 | 63 | 40 | 12 | 22 | 28.8 | M16 | 0.2 | with | RPMT10T3... |
| HRP12R025MM12-02 | 6 | 13 | 2 | 25 | 57 | 35 | 10 | 17 | 20.8 | M12 | 0.2 | with | RPMT1204... |
| HRP12R032MM16-03 | 6 | 20 | 3 | 32 | 63 | 40 | 12 | 22 | 28.8 | M16 | 0.2 | with | RPMT1204... |

## SPARE PARTS

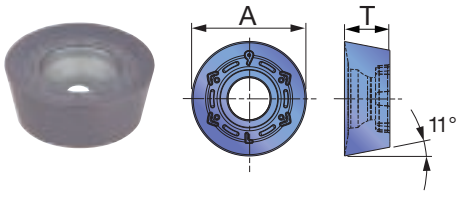
| Designation | Clamping screw | Lubricant | Wrench | |
|---|---|---|---|---|
| | | | Bit | Grip |
| HRP10R... | CSPB-3.5S | M-1000 | BLD IP15/S7 | H-TBS |
| HRP12R... | CSTR-4L100 | M-1000 | BT15S | H-TBS |

## INSERT

### RPMT-MJ




### RPMT-ML




| | | | | | | |
|---|---|---|---|---|---|---|
| P | Steel | | ★ | | | |
| M | Stainless | ★ | ☆ | ★ | | |
| K | Cast iron | | ☆ | | | |
| N | Non-ferrous | | | | | |
| S | Superalloys | ☆ | ★ | | | |
| H | Hard materials | | | | | |

★ : First choice
☆ : Second choice

| Designation | Max. ap | Coating | | | A | T |
|---|---|---|---|---|---|---|
| | | AH130 | AH725 | AH4035 | | |
| RPMT10T3EN-MJ | 5 | ● | ● | ● | 10 | 3.97 |
| RPMT10T3EN-ML | 5 | ● | ● | ● | 10 | 3.97 |
| RPMT1204EN-MJ | 6 | ● | ● | ● | 12 | 4.76 |
| RPMT1204EN-ML | 6 | ● | ● | ● | 12 | 4.76 |
| RPMT1606EN-MJ | 8 | ● | ● | ● | 16 | 6.35 |
| RPMT1606EN-ML | 8 | ● | ● | ● | 16 | 6.35 |

●: Line-up

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Hardness | Priority | Grade | Chip-breaker | Cutting speed | Feed per tooth |
|---|---|---|---|---|---|---|---|
| P | Carbon steels C45, C55, etc. | < 300 HB | First choice | AH725 | MJ | 120 - 250 | 0.3 - 0.7 |
| | | < 300 HB | for impact resistance | AH130 | MJ | 120 - 250 | 0.3 - 0.7 |
| | Alloy steels 42CrMo4, 17Cr3, etc. | 150 - 300 HB | First choice | AH725 | MJ | 100 - 250 | 0.2 - 0.6 |
| | | 150 - 300 HB | for impact resistance | AH130 | MJ | 100 - 250 | 0.2 - 0.6 |
| | Tool steels X153CrMoV12, etc. | < 300 HB | | AH725 | ML | 80 - 180 | 0.2 - 0.4 |
| M | Stainless steels X5CrNi18-9, X5CrNiMo17-12-3, etc. | < 200 HB | First choice | AH130 | ML | 100 - 250 | 0.2 - 0.6 |
| | | < 200 HB | for impact resistance | AH130 | MJ | 100 - 250 | 0.2 - 0.6 |
| | Stainless steels X6Cr17, etc. | < 200 HB | First choice | AH4035 | ML | 100 - 300 | 0.2 - 0.6 |
| | | < 200 HB | for impact resistance | AH4035 | MJ | 100 - 300 | 0.2 - 0.6 |
| K | Grey cast irons 250, etc. | 150 - 250 HB | - | AH725 | ML | 120 - 250 | 0.3 - 0.7 |
| | Ductile cast irons 400-15S, etc. | 150 - 250 HB | - | AH725 | ML | 100 - 200 | 0.3 - 0.7 |
| H | Hardened steels X40CrMoV5-1, etc. | 40 - 50 HRC | - | AH725 | MJ | 60 - 140 | 0.1 - 0.3 |
| | Hardened steels X153CrMoV12, etc. | 50 - 60 HRC | - | AH725 | MJ | 20 - 60 | 0.05 - 0.2 |

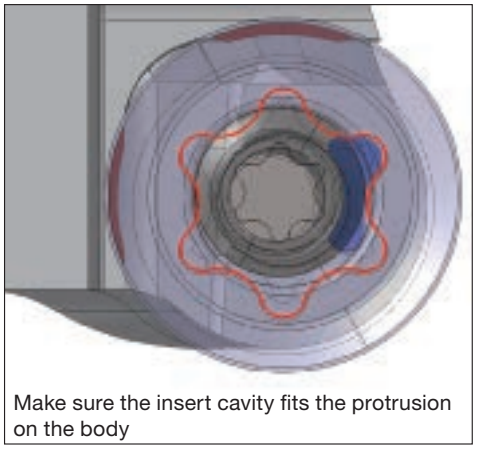
· Use air blast to remove chips from the work area in slot milling or pocketing operation.
· When machining at high cutting speeds of more than *Vc* = 1000 m/min, the dynamic balance of the tools must be adjusted.
· Cutting conditions are limited by machine power, workpiece rigidity and spindle output. When the cutting width or depth is large, set *Vc* and *fz* to the lower recommended values and check the machine power and vibration.

Tool dia.: ø*D*c (mm), Number of revolutions: *n* (min$^{-1}$), Feed speed: *V*f (mm/min), Depth of cut: ap = 2.0 mm

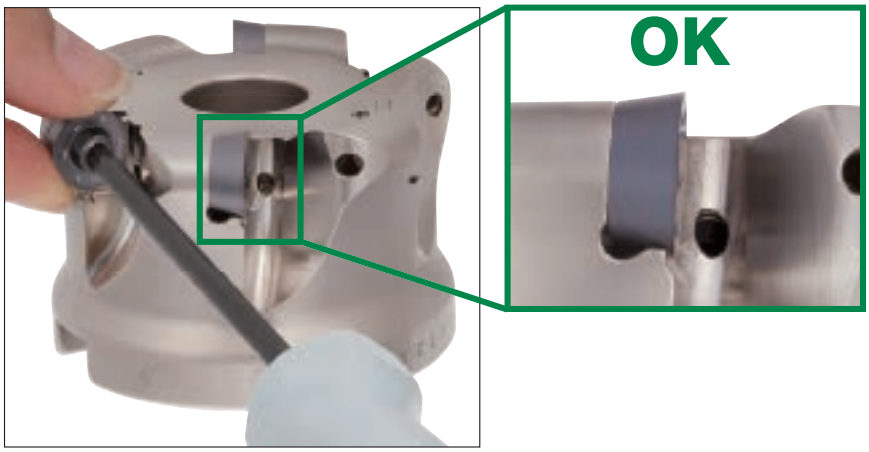
| ø20 | | ø25 | | ø32 | | | ø35 | | ø40 | | | | ø50 | | ø63 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *n* | *V*f | *n* | *V*f | *n* | *V*f | | *n* | *V*f | *n* | *V*f | | | *n* | *V*f | *n* | *V*f | |
| | E/HRP10 | | E/HRP10, E/HRP12 | | E/HRP10 | E/HRP12 | | ERP10 | | TRP10 | ERP12 | ERP16 | | ERP12 | | TRP12 | TRP16 |
| 2870 | 2870 | 2290 | 2290 | 1790 | 3580 | 2690 | 1640 | 3280 | 1430 | 3580 | 2860 | 1430 | 1150 | 2880 | 910 | 2730 | 2280 |
| *Vc* = 180 m/min, *fz* = 0.5 mm/t | | | | | | | | | | | | | | | | | |
| 2870 | 2870 | 2290 | 2290 | 1790 | 3580 | 2690 | 1640 | 3280 | 1430 | 3580 | 2860 | 1430 | 1150 | 2880 | 910 | 2730 | 2280 |
| *Vc* = 180 m/min, *fz* = 0.5 mm/t | | | | | | | | | | | | | | | | | |
| 2710 | 2160 | 2170 | 1740 | 1690 | 2700 | 2030 | 1550 | 2480 | 1350 | 2700 | 2160 | 1080 | 1080 | 2160 | 860 | 2060 | 1720 |
| *Vc* = 170 m/min, *fz* = 0.4 mm/t | | | | | | | | | | | | | | | | | |
| 2710 | 2160 | 2170 | 1740 | 1690 | 2700 | 2030 | 1550 | 2480 | 1350 | 2700 | 2160 | 1080 | 1080 | 2160 | 860 | 2060 | 1720 |
| *Vc* = 170 m/min, *fz* = 0.4 mm/t | | | | | | | | | | | | | | | | | |
| 2070 | 1240 | 1660 | 1000 | 1290 | 1550 | 1160 | 1180 | 1420 | 1030 | 1550 | 1240 | 620 | 830 | 1250 | 660 | 1190 | 990 |
| *Vc* = 130 m/min, *fz* = 0.3 mm/t | | | | | | | | | | | | | | | | | |
| 2710 | 2160 | 2170 | 1740 | 1690 | 2700 | 2030 | 1550 | 2480 | 1350 | 2700 | 2160 | 1080 | 1080 | 2160 | 860 | 2060 | 1720 |
| *Vc* = 170 m/min, *fz* = 0.4 mm/t | | | | | | | | | | | | | | | | | |
| 2710 | 2160 | 2170 | 1740 | 1690 | 2700 | 2030 | 1550 | 2480 | 1350 | 2700 | 2160 | 1080 | 1080 | 2160 | 860 | 2060 | 1720 |
| *Vc* = 170 m/min, *fz* = 0.4 mm/t | | | | | | | | | | | | | | | | | |
| 3180 | 2540 | 2550 | 2040 | 1990 | 3180 | 2390 | 1820 | 2910 | 1590 | 3180 | 2540 | 1270 | 1270 | 2540 | 1010 | 2420 | 2020 |
| *Vc* = 200 m/min, *fz* = 0.4 mm/t | | | | | | | | | | | | | | | | | |
| 3180 | 2540 | 2550 | 2040 | 1990 | 3180 | 2390 | 1820 | 2910 | 1590 | 3180 | 2540 | 1270 | 1270 | 2540 | 1010 | 2420 | 2020 |
| *Vc* = 200 m/min, *fz* = 0.4 mm/t | | | | | | | | | | | | | | | | | |
| 2870 | 2870 | 2290 | 2290 | 1790 | 3580 | 2690 | 1640 | 3280 | 1430 | 3580 | 2860 | 1430 | 1150 | 2880 | 910 | 2730 | 2280 |
| *Vc* = 180 m/min, *fz* = 0.5 mm/t | | | | | | | | | | | | | | | | | |
| 2390 | 2390 | 1910 | 1910 | 1490 | 2980 | 2240 | 1360 | 2720 | 1190 | 2980 | 2380 | 1190 | 950 | 2380 | 760 | 2280 | 1900 |
| *Vc* = 150 m/min, *fz* = 0.5 mm/t | | | | | | | | | | | | | | | | | |
| 1590 | 630 | 1270 | 510 | 990 | 790 | 590 | 910 | 730 | 800 | 800 | 640 | 320 | 640 | 640 | 510 | 610 | 510 |
| *Vc* = 100 m/min, *fz* = 0.2 mm/t | | | | | | | | | | | | | | | | | |
| 640 | 150 | 510 | 120 | 400 | 190 | 140 | 360 | 170 | 320 | 190 | 150 | 75 | 250 | 150 | 200 | 140 | 120 |
| *Vc* = 40 m/min, *fz* = 0.12 mm/t | | | | | | | | | | | | | | | | | |

## ■ Notification for clamping

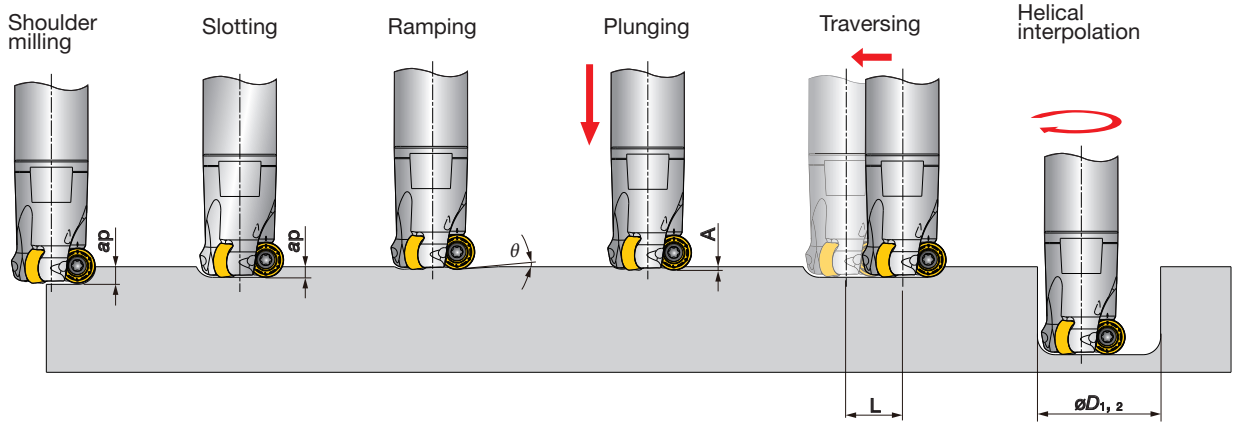
· When installing the insert, please carefully locate the insert in the seat and fasten the screw.



Make sure the insert cavity fits the protrusion on the body



# APPLICATION RANGE




| Designation | Tool-ø øDc (mm) | Max. depth of cut ap (mm) | Max. ramping angle θ° | Max. plunging depth A (mm) | Machining length for removing uncut portion L (mm) | Min.machining øD1(mm) | *Max. machining øD2 (mm) |
|---|---|---|---|---|---|---|---|
| ERP10R020M20.0-02 | 20 | 5 | 2.2 | 0.3 | 12 | 27 | 39 |
| HRP10R020MM10-02 | 20 | 5 | 2.2 | 0.3 | 12 | 27 | 39 |
| ERP10R025M25.0-02 | 25 | 5 | 3.4 | 0.7 | 16 | 35 | 49 |
| HRP10R025MM12-02 | 25 | 5 | 3.4 | 0.7 | 16 | 35 | 49 |
| ERP12R025M25.0-02 | 25 | 6 | 4.4 | 0.7 | 14 | 33 | 49 |
| HRP12R025MM12-02 | 25 | 6 | 4.4 | 0.7 | 14 | 33 | 49 |
| ERP10R032M32.0-04 | 32 | 5 | 8 | 2.5 | 23 | 46 | 63 |
| HRP10R032MM16-04 | 32 | 5 | 8 | 2.5 | 23 | 46 | 63 |
| ERP10R035M32.0-04 | 35 | 5 | 8.2 | 3 | 26 | 51 | 69 |
| ERP12R032M32.0-03 | 32 | 6 | 10 | 2.7 | 21 | 53 | 63 |
| HRP12R032MM16-03 | 32 | 6 | 10 | 2.7 | 21 | 53 | 63 |
| ERP12R040M32.0-04 | 40 | 6 | 6.6 | 2.7 | 29 | 59 | 79 |
| ERP16R040M32.0-02 | 40 | 8 | 8.4 | 2.7 | 25 | 53 | 79 |
| TRP10R040M16.0E05 | 40 | 5 | 6.5 | 3 | 31 | 61 | 79 |
| TRP12R050M22.0E05 | 50 | 6 | 4.5 | 2.7 | 39 | 79 | 99 |
| TRP12R052M22.0E05 | 52 | 6 | 4 | 2.7 | 41 | 83 | 103 |
| TRP12R063M22.0E06 | 63 | 6 | 3.3 | 2.7 | 52 | 105 | 125 |
| TRP12R066M27.0E06 | 66 | 6 | 3 | 2.7 | 55 | 111 | 131 |
| TRP16R063M22.0E05 | 63 | 8 | 3.6 | 2.7 | 48 | 99 | 125 |
| TRP16R066M27.0E05 | 66 | 8 | 3.4 | 2.7 | 51 | 105 | 131 |

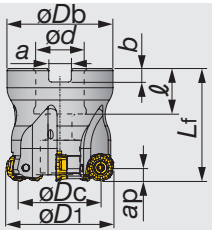
*For flat bottom hole

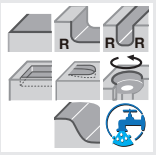
# ROUNDSPLIT
## TRC12/16

Face mills with button insert of 6mm or 8mm radius

A.R. = +0°, R.R. = -1°~ -5°






| Designation | Max. ap | øDc | z | øD1 | øDb | Lf | ød | ℓ | a | b | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TRC12R040M16.0E04 | 6 | 28 | 4 | 40 | 35 | 40 | 16 | 19 | 8.4 | 5.6 | 0.2 | with | RCMT1204... |
| TRC12R050M22.0E05 | 6 | 38 | 5 | 50 | 47 | 50 | 22 | 20 | 10.4 | 6.3 | 0.4 | with | RCMT1204... |
| TRC12R052M22.0E05 | 6 | 40 | 5 | 52 | 49 | 50 | 22 | 20 | 10.4 | 6.3 | 0.4 | with | RCMT1204... |
| TRC12R063M22.0E06 | 6 | 51 | 6 | 63 | 59 | 50 | 22 | 20 | 10.4 | 6.3 | 0.7 | with | RCMT1204... |
| TRC12R066M22.0E06 | 6 | 54 | 6 | 66 | 62 | 50 | 22 | 20 | 10.4 | 6.3 | 0.7 | with | RCMT1204... |
| TRC12R080M27.0E07 | 6 | 68 | 7 | 80 | 76 | 50 | 27 | 22 | 12.4 | 7 | 1.1 | with | RCMT1204... |
| TRC16R050M22.0E04 | 8 | 34 | 4 | 50 | 47 | 50 | 22 | 20 | 10.4 | 6.3 | 0.3 | with | RCMT1606... |
| TRC16R052M22.0E04 | 8 | 36 | 4 | 52 | 49 | 50 | 22 | 20 | 10.4 | 6.3 | 0.4 | with | RCMT1606... |
| TRC16R063M22.0E05 | 8 | 47 | 5 | 63 | 59 | 50 | 22 | 20 | 10.4 | 6.3 | 0.6 | with | RCMT1606... |
| TRC16R066M22.0E05 | 8 | 50 | 5 | 66 | 62 | 50 | 22 | 20 | 10.4 | 6.3 | 0.7 | with | RCMT1606... |
| TRC16R080M27.0E06 | 8 | 64 | 6 | 80 | 76 | 50 | 27 | 22 | 12.4 | 7 | 1 | with | RCMT1606... |
| TRC16R100M32.0E07 | 8 | 84 | 7 | 100 | 96 | 63 | 32 | 25 | 14.4 | 8 | 2.4 | with | RCMT1606... |
| TRC16R125M40.0E08 | 8 | 109 | 8 | 125 | 98 | 63 | 40 | 32 | 16.4 | 9 | 3 | with | RCMT1606... |

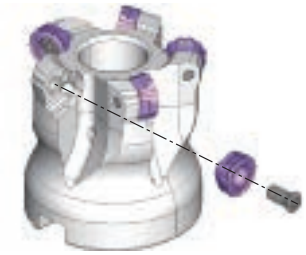
### SPARE PARTS







| Designation | Clamping screw | Grip | Shell locking bolt | Shell locking bolt 1 | Torx bit |
|---|---|---|---|---|---|
| TRC12R040... | CSTB-4L090 | H-TBS | - | FSHM8-30H | BT15S |
| TRC12R050 - 066... | CSTB-4L090 | H-TBS | - | CM10X30H | BT15S |
| TRC12R080M27.0E07 | CSTB-4L090 | H-TBS | - | CM12X30H | BT15S |
| TRC16R050 - 052... | CSTB-5L120 | H-TB | - | FSHM10-40H | BT20S |
| TRC16R063 - 066... | CSTB-5L120 | H-TB | - | CM10X30H | BT20S |
| TRC16R080M27.0E06 | CSTB-5L120 | H-TB | - | CM12X30H | BT20S |
| TRC16R100... | CSTB-5L120 | H-TB | - | CM16X40H | BT20S |
| TRC16R125... | CSTB-5L120 | H-TB | TMBA-M20H | - | BT20M |

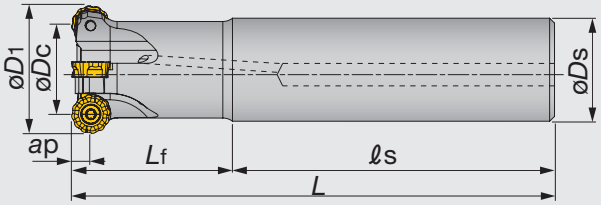


# ROUNDSPLIT
## ERC12/16

Indexable endmills with button insert of 6mm or 8mm radius

A.R. = +0°, R.R. = -1°~ -5°









| Designation | Max. ap | øDc | z | øD1 | øDs | L | Lf | ℓs | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ERC12R032M32.0-03 | 6 | 20 | 3 | 32 | 32 | 150 | 70 | 80 | 0.8 | with | RCMT1204... |
| ERC12R032M32.0-03L | 6 | 20 | 3 | 32 | 32 | 250 | 150 | 100 | 1.3 | with | RCMT1204... |
| ERC12R032M32.0-03LL | 6 | 20 | 3 | 32 | 32 | 300 | 180 | 120 | 1.6 | with | RCMT1204... |
| ERC12R033M32.0-03 | 6 | 21 | 3 | 33 | 32 | 150 | 70 | 80 | 0.8 | with | RCMT1204... |
| ERC12R033M32.0-03L | 6 | 21 | 3 | 33 | 32 | 250 | 150 | 100 | 1.4 | with | RCMT1204... |
| ERC12R033M32.0-03LL | 6 | 21 | 3 | 33 | 32 | 300 | 70 | 230 | 1.7 | with | RCMT1204... |
| ERC12R040M32.0-04 | 6 | 28 | 4 | 40 | 32 | 150 | 50 | 100 | 0.8 | with | RCMT1204... |
| ERC12R040M32.0-04L | 6 | 28 | 4 | 40 | 32 | 250 | 50 | 200 | 1.5 | with | RCMT1204... |
| ERC12R040M32.0-04LL | 6 | 28 | 4 | 40 | 32 | 300 | 50 | 250 | 1.8 | with | RCMT1204... |
| ERC12R050M42.0-05 | 6 | 38 | 5 | 50 | 42 | 150 | 50 | 100 | 1.5 | with | RCMT1204... |
| ERC12R050M42.0-05L | 6 | 38 | 5 | 50 | 42 | 250 | 50 | 200 | 2.6 | with | RCMT1204... |
| ERC12R050M42.0-05LL | 6 | 38 | 5 | 50 | 42 | 300 | 50 | 250 | 3 | with | RCMT1204... |
| ERC16R040M32.0-02 | 8 | 24 | 2 | 40 | 32 | 150 | 50 | 100 | 0.8 | with | RCMT1606... |
| ERC16R040M32.0-02L | 8 | 24 | 2 | 40 | 32 | 250 | 50 | 200 | 1.4 | with | RCMT1606... |
| ERC16R040M32.0-02LL | 8 | 24 | 2 | 40 | 32 | 300 | 50 | 250 | 1.7 | with | RCMT1606... |
| ERC16R050M42.0-03 | 8 | 34 | 3 | 50 | 42 | 150 | 50 | 100 | 1.4 | with | RCMT1606... |
| ERC16R050M42.0-03L | 8 | 34 | 3 | 50 | 42 | 250 | 50 | 200 | 2.4 | with | RCMT1606... |
| ERC16R050M42.0-03LL | 8 | 34 | 3 | 50 | 42 | 300 | 50 | 250 | 3 | with | RCMT1606... |

### SPARE PARTS

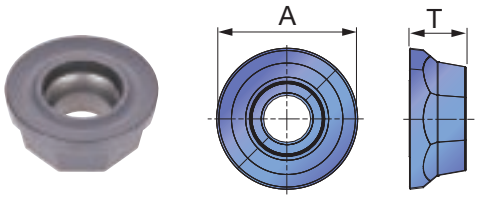




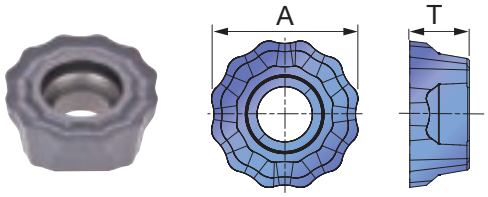
| Designation | Clamping screw | Wrench |
|---|---|---|
| ERC12R... | CSTB-4L090 | T-15DB |
| ERC16R040... | CSTB-5L105 | T-20DB |
| ERC16R050... | CSTB-5L120 | T-20DB |

## INSERT

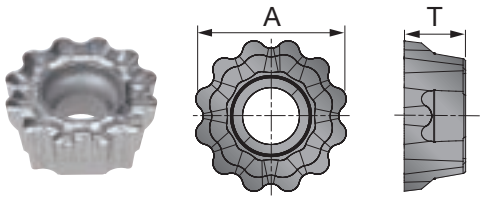
### RCMT-MJ




### RCMT-NMJ




### RCMT-NAJ




| | | | | | | |
|---|---|---|---|---|---|---|
| P | Steel | ☆ | | ★ | | |
| M | Stainless | | ★ | ☆ | | |
| K | Cast iron | ★ | | ☆ | | |
| N | Non-ferrous | | | | ★ | |
| S | Superalloys | ★ | | ★ | | |
| H | Hard materials | | | | | |

★ : First choice
☆ : Second choice

| Designation | Max. ap | Coating | | | Un-coated | A | T |
|---|---|---|---|---|---|---|---|
| | | AH120 | AH140 | AH725 | KS15F | | |
| RCMT1204EN-MJ | 6 | ● | ● | ● | | 12 | 4.8 |
| RCMT1204EN-NMJ | 6 | ● | ● | ● | | 12 | 4.8 |
| RCMT1204FN-NAJ | 6 | | | | ● | 12 | 4.8 |
| RCMT1606EN-MJ | 8 | ● | ● | ● | | 16 | 6.5 |
| RCMT1606EN-NMJ | 8 | ● | ● | ● | | 16 | 6.5 |
| RCMT1606FN-NAJ | 8 | | | | ● | 16 | 6.5 |

●: Line-up

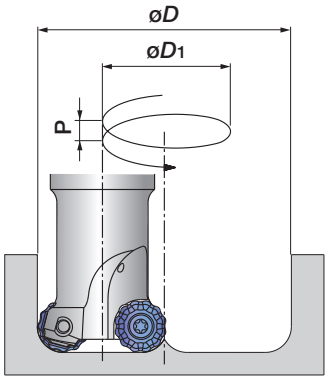
## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Hardness HB | Grade | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) each chipbreaker | | |
|---|---|---|---|---|---|---|---|
| | | | | | MJ | NMJ | NAJ |
| P | Low carbon steels C15E4, E275A, etc. | ~ 200 | AH725 | 100 - 220 | 0.2 - 0.7 | 0.17 - 0.3 | - |
| P | High carbon steels C45, C55, etc. | 200 ~ 300 | AH725 | 100 - 200 | 0.2 - 0.7 | 0.17 - 0.25 | - |
| P | Alloyed steels 42CrMo4, 20Cr4, etc. | 150 ~ 300 | AH725 | 100 - 200 | 0.2 - 0.7 | 0.17 - 0.25 | - |
| P | Tool steels X40CrMoV5-1, etc. | ~ 300 | AH725 | 100 - 180 | 0.2 - 0.7 | 0.17 - 0.25 | - |
| M | Stainless steels X5CrNi18-9, X5CrNiMo17-12-3, etc. | - | AH140 | 90 - 180 | 0.2 - 0.6 | 0.15 - 0.25 | - |
| K | Grey cast irons 250, 300, etc. | 150 ~ 250 | AH120 | 140 - 250 | 0.2 - 0.7 | 0.17 - 0.3 | - |
| K | Ductile cast irons 400-15S, etc. | 150 ~ 250 | AH120 | 140 - 250 | 0.2 - 0.7 | 0.17 - 0.3 | - |
| N | Aluminium alloys Si < 13% | - | KS15F | 500 - 1200 | - | - | 0.1 - 0.3 |
| N | Aluminium alloys Si ≥ 13% | - | KS15F | 100 - 300 | - | - | 0.1 - 0.3 |
| S | Heat-resisting alloy Inconel 718, Ti-6Al-4V, etc. | - | AH725 | 20 - 50 | 0.2 - 0.6 | 0.15 - 0.25 | - |

· To remove excessive chip accumulation use an air blast.
· When chips stick to the cutting edges (aluminium machining), use a water soluble cutting fluid.

· Cutting conditions are limited by machine power and material rigidity. When the cutting width or depth is large, set Vc and fz below the recommended values and check the machine vibration and spindle load.

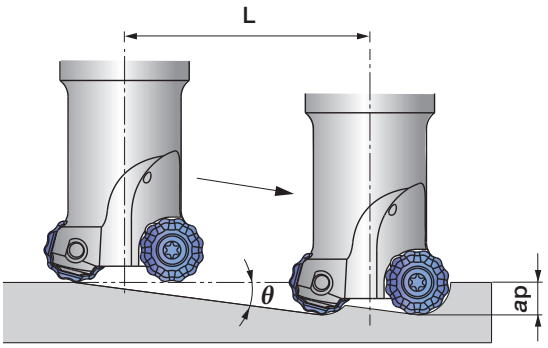
## Holemaking with helical feed




| Designation | Tool ø øDc (mm) | Min. machining diameter (mm) | | Max. machining diameter (mm) | | Pitch P (mm) |
|---|---|---|---|---|---|---|
| | | øD | øD1 | øD | øD1 | |
| ERC12R032… | ø32 | 52 | 20 | 62 | 30 | < 6 |
| ERC12R033… | ø33 | 54 | 21 | 64 | 31 | < 6 |
| T/ERC12R040… | ø40 | 68 | 28 | 78 | 38 | < 6 |
| T/ERC12R050… | ø50 | 88 | 38 | 98 | 48 | < 6 |
| TRC12R063… | ø63 | 114 | 51 | 124 | 61 | < 6 |
| TRC12R080… | ø80 | 148 | 68 | 158 | 78 | < 6 |
| ERC16R040… | ø40 | 64 | 24 | 78 | 38 | < 8 |
| T/ERC16R050… | ø50 | 84 | 34 | 98 | 48 | < 8 |
| TRC16R063… | ø63 | 110 | 47 | 124 | 61 | < 8 |
| TRC16R080… | ø80 | 144 | 64 | 158 | 78 | < 8 |
| TRC16R100… | ø100 | 184 | 84 | 198 | 98 | < 8 |
| TRC16R125… | ø125 | 234 | 109 | 248 | 123 | < 8 |

When holemaking with a helical feed, the pitch (P) needs to be set at lower values than that shown above.

## Ramping




| Designation | Tool ø øDc (mm) | Max. ramping angle θ° | L: tool pass length when ramping angle is 2 degrees | | | | |
|---|---|---|---|---|---|---|---|
| | | | ap (mm) | | | | |
| | | | 2 | 3 | 4 | 6 | 8 |
| ERC12R032… | ø32 | 10 | 57 | 85 | 114 | 171 | – |
| ERC12R033… | ø33 | 9 | 57 | 85 | 114 | 171 | – |
| T/ERC12R040… | ø40 | 6 | 57 | 85 | 114 | 171 | – |
| T/ERC12R050… | ø50 | 4 | 57 | 85 | 114 | 171 | – |
| TRC12R063… | ø63 | 3 | 57 | 85 | 114 | 171 | – |
| TRC12R080… | ø80 | 2.3 | 57 | 85 | 114 | 171 | – |
| ERC16R040… | ø40 | 12 | 57 | 85 | 114 | 171 | 229 |
| T/ERC16R050… | ø50 | 7.4 | 57 | 85 | 114 | 171 | 229 |
| TRC16R063… | ø63 | 6 | 57 | 85 | 114 | 171 | 229 |
| TRC16R080… | ø80 | 4.3 | 57 | 85 | 114 | 171 | 229 |
| TRC16R100… | ø100 | 3 | 57 | 85 | 114 | 171 | 229 |
| TRC16R125… | ø125 | 2.4 | 57 | 85 | 114 | 171 | 229 |

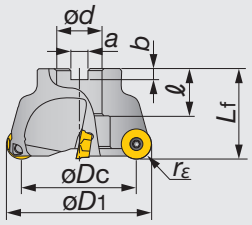
Tool pass length: L = ap / tan θ, Ramping angle needs to be set at smaller than 2 degrees in order to prevent chips from getting tangled.

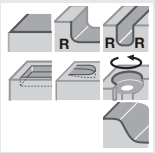
## TRD12/16

Face mills with button insert of 6 mm or 8 mm radius

A.R. = +10°, R.R. = -6°~ 0°






| Designation | Max. ap | øDc | z | øD1 | Lf | ød | ℓ | a | b | rε | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TRD12050R-E | 6 | 38 | 4 | 50 | 40 | 22 | 20 | 10.4 | 6.3 | 6 | 0.3 | RDM*1204... |
| TRD12052R-E | 6 | 40 | 4 | 52 | 40 | 22 | 20 | 10.4 | 6.3 | 6 | 0.3 | RDM*1204... |
| TRD12063R-E | 6 | 51 | 5 | 63 | 40 | 22 | 20 | 10.4 | 6.3 | 6 | 0.4 | RDM*1204... |
| TRD12066R-E | 6 | 54 | 5 | 66 | 40 | 22 | 20 | 12.4 | 7 | 6 | 0.5 | RDM*1204... |
| TRD12080R-E | 6 | 68 | 6 | 80 | 50 | 27 | 22 | 12.4 | 7 | 6 | 0.8 | RDM*1204... |
| TRD12100R-E | 6 | 88 | 6 | 100 | 50 | 32 | 26 | 14.4 | 8 | 6 | 1.4 | RDM*1204... |
| TRD16063R-E | 8 | 47 | 4 | 63 | 40 | 22 | 20 | 10.4 | 6.3 | 8 | 0.4 | RDM*1606... |
| TRD16066R-E | 8 | 50 | 4 | 66 | 50 | 27 | 22 | 12.4 | 7 | 8 | 0.5 | RDM*1606... |
| TRD16080R-E | 8 | 64 | 5 | 80 | 50 | 27 | 22 | 12.4 | 7 | 8 | 0.7 | RDM*1606... |
| TRD16100R-E | 8 | 84 | 6 | 100 | 50 | 32 | 26 | 14.4 | 8 | 8 | 1.1 | RDM*1606... |

### SPARE PARTS






| Designation | Clamp screw | Lubricant | Shell locking bolt | Wrench |
|---|---|---|---|---|
| TRD12...-E | CSTB-3.5 | M-1000 | - | T-15D |
| TRD16...-E | CSTB-5 | M-1000 | - | T-20D |

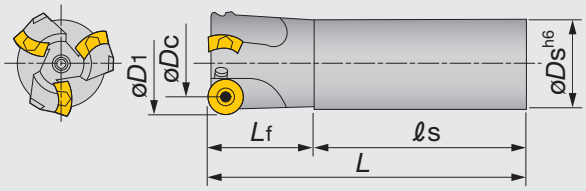


## ERD12/16

Indexable endmills with button insert of 6 mm or 8 mm radius

A.R. = +8°~ 10°, R.R. = -6°~ -2°






| Designation | Max. ap | øDc | z | øD1 | øDs | L | Lf | ℓs | Insert |
|---|---|---|---|---|---|---|---|---|---|
| ERD12032RS | 6 | 20 | 2 | 32 | 32 | 150 | 50 | 100 | RDM*1204... |
| ERD12032RL | 6 | 20 | 2 | 32 | 32 | 250 | 50 | 200 | RDM*1204... |
| ERD12040RS | 6 | 28 | 3 | 40 | 32 | 150 | 50 | 100 | RDM*1204... |
| ERD12040RL | 6 | 28 | 3 | 40 | 32 | 250 | 50 | 200 | RDM*1204... |
| ERD12050RS | 6 | 38 | 4 | 50 | 42 | 150 | 50 | 100 | RDM*1204... |
| ERD12050RL | 6 | 38 | 4 | 50 | 42 | 250 | 50 | 200 | RDM*1204... |
| ERD12063RS | 6 | 51 | 4 | 63 | 42 | 150 | 50 | 100 | RDM*1204... |
| ERD12063RL | 6 | 51 | 4 | 63 | 42 | 250 | 50 | 200 | RDM*1204... |
| ERD16040RS | 8 | 24 | 2 | 40 | 32 | 150 | 50 | 100 | RDM*1606... |
| ERD16040RL | 8 | 24 | 2 | 40 | 32 | 250 | 50 | 200 | RDM*1606... |
| ERD16050RS | 8 | 34 | 3 | 50 | 42 | 150 | 50 | 100 | RDM*1606... |
| ERD16050RL | 8 | 34 | 3 | 50 | 42 | 250 | 50 | 200 | RDM*1606... |
| ERD16063RS | 8 | 47 | 3 | 63 | 42 | 150 | 50 | 100 | RDM*1606... |
| ERD16063RL | 8 | 47 | 3 | 63 | 42 | 250 | 50 | 200 | RDM*1606... |

### SPARE PARTS



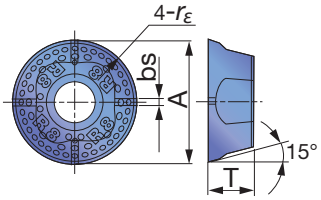


| Designation | Clamp screw | Lubricant | Wrench |
|---|---|---|---|
| ERD120**R* | CSTB-3.5 | M-1000 | T-15D |
| ERD160**R* | CSTB-5 | M-1000 | T-20D |

## INSERT

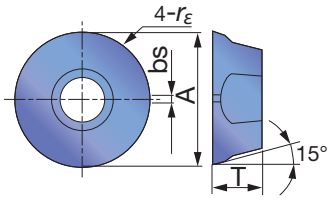
### RDMT12/16-MJ

Button insert with pressed MJ chipbreaker




### RDMW12/16

Flat-top button insert with 6 mm or 8 mm radius




| | | AH120 | AH130 | AH140 | AH330 | T3130 | UX30 |
|---|---|---|---|---|---|---|---|
| P | Steel | ☆ | | | ★ | ★ | ☆ |
| M | Stainless | | ★ | ☆ | | | |
| K | Cast iron | ★ | | | | | |
| N | Non-ferrous | | | | | | |
| S | Superalloys | ★ | ☆ | | | | |
| H | Hard materials | | | | | | |

★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | Coating | | | | | Un-coated | A | T | bs |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | AH120 | AH130 | AH140 | AH330 | T3130 | UX30 | | | |
| RDMT1204ZDPN-MJ | 6 | 6 | ● | | ● | ● | ● | ● | 12.8 | 4.76 | 0.8 |
| RDMW1204ZDSN | 6 | 6 | ● | | ● | | ● | | 12.8 | 4.8 | 0.8 |
| RDMT1606ZDPN-MJ | 8 | 8 | ● | ● | ● | ● | ● | ● | 16.8 | 6.35 | 0.8 |
| RDMW1606ZDSN | 8 | 8 | ● | | ● | | ● | | 16.8 | 6.4 | 0.8 |

●: Line-up

## STANDARD CUTTING CONDITIONS

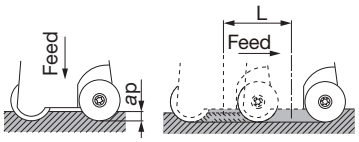
| ISO | Workpiece material | Grade | Cutting speed Vc (m/min) | Feed per tooth f (mm/t) | |
|---|---|---|---|---|---|
| | | | | T/ERD12 | T/ERD16 |
| P | Carbon steels C50, etc. < 300 HB | AH120 | 170 (120 ~ 220) | 0.3 ~ 0.5 | 0.3 ~ 0.6 |
| | | AH330 | 190 (140 ~ 240) | 0.2 ~ 0.4 | 0.2 ~ 0.5 |
| | | UX30 | 100 (80 ~ 120) | 0.2 ~ 0.4 | 0.2 ~ 0.5 |
| | Alloy steels 42CrMo4, 17Cr3, etc. < 300 HB | AH120 | 150 (100 ~ 200) | 0.2 ~ 0.45 | 0.2 ~ 0.5 |
| | | AH330 | 170 (120 ~ 220) | 0.15 ~ 0.35 | 0.15 ~ 0.4 |
| | | UX30 | 90 (60 ~ 120) | 0.15 ~ 0.35 | 0.15 ~ 0.4 |
| | Die steels X96CrMoV12, etc. < 300 HB | AH120 | 130 (80 ~ 180) | 0.2 ~ 0.35 | 0.25 ~ 0.45 |
| | | AH330 | 150 (100 ~ 200) | 0.1 ~ 0.3 | 0.1 ~ 0.4 |
| M | Stainless steels X5CrNi18 9, etc. | AH130·AH140 | 150 (100 ~ 200) | 0.2 ~ 0.3 | 0.2 ~ 0.4 |
| K | Grey Cast irons 250, etc. | AH120 | 180 (120 ~ 240) | 0.3 ~ 0.5 | 0.3 ~ 0.6 |
| | | AH330 | 200 (150 ~ 250) | 0.2 ~ 0.4 | 0.2 ~ 0.5 |
| H | Hard materials < 45 HRC | AH120 | 100 (60 ~ 140) | 0.08 ~ 0.25 | 0.1 ~ 0.3 |

Note: When the depth of cut is smaller than 2 mm, use the higher limit of feed values shown above. When larger than 3 mm, use the lower limit of the feed values.

## Plunging + traverse feed milling (Unit: mm)

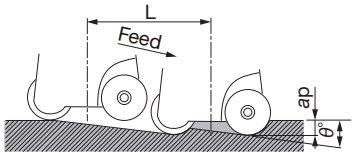
Plunging

Traverse feed milling

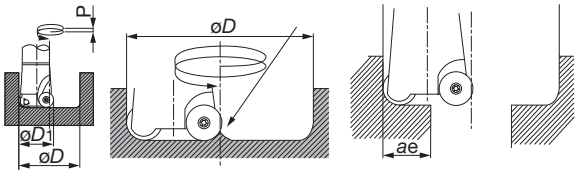



Unit: mm

## Ramping




## Helical feed drilling




| Designation | ø*D*1 | Max. plunging depth *ap* | Max. ramping angle *θ*° | Min. traverse length to flatten the bottom surface L | Min. machining diameter ø*D* | Max. machining diameter ø*D* | Pitch P | ø*D*c-ra *ae* |
|---|---|---|---|---|---|---|---|---|
| TRD12050R... | 50 | 4 | 6 | ø*D*1 - 11 | 88 | 98 | < 6 | 44 |
| TRD12052R-E | 52 | 4 | 5.5 | ø*D*1 - 11 | 92 | 102 | < 6 | 46 |
| TRD12063R... | 63 | 4 | 4 | ø*D*1 - 11 | 114 | 124 | < 6 | 57 |
| TRD12066R... | 66 | 4 | 4 | ø*D*1 - 11 | 120 | 130 | < 6 | 60 |
| TRD12080R... | 80 | 4 | 2.5 | ø*D*1 - 11 | 148 | 158 | < 6 | 74 |
| TRD12100R... | 100 | 4 | 1.5 | ø*D*1 - 11 | 188 | 198 | < 6 | 94 |
| TRD16063R... | 63 | 5.5 | 6 | ø*D*1 - 15 | 110 | 124 | < 8 | 55 |
| TRD16066R... | 66 | 5.5 | 6 | ø*D*1 - 15 | 120 | 130 | < 8 | 58 |
| TRD16080R... | 80 | 5.5 | 4 | ø*D*1 - 15 | 144 | 158 | < 8 | 72 |
| TRD16100R... | 100 | 5.5 | 3 | ø*D*1 - 15 | 184 | 198 | < 8 | 92 |
| ERD12032RS/L | 32 | 4 | 16 | ø*D*1 - 11 | 52 | 62 | < 6 | 26 |
| ERD12040RS/L | 40 | 4 | 8 | ø*D*1 - 11 | 68 | 78 | < 6 | 34 |
| ERD12050RS/L | 50 | 4 | 6 | ø*D*1 - 11 | 88 | 98 | < 6 | 44 |
| ERD12063RS/L | 63 | 4 | 4 | ø*D*1 - 11 | 114 | 124 | < 6 | 57 |
| ERD16040RS/L | 40 | 5.5 | 20 | ø*D*1 - 15 | 64 | 78 | < 8 | 32 |
| ERD16050RS/L | 50 | 5.5 | 10 | ø*D*1 - 15 | 84 | 98 | < 8 | 42 |
| ERD16063RS/L | 63 | 5.5 | 6 | ø*D*1 - 15 | 110 | 124 | < 8 | 55 |

ø*D*1 : Tool diameter
ø*D* : Drilling diameter
P : Z-axis feed per one round of tool pass (Pitch of helical cycle)

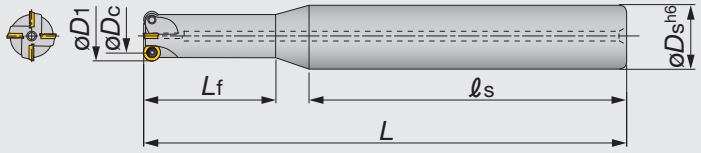
Notes:
- In plunging, the maximum plunging depth is limited as shown in the above table.
- In plunging, set the Z-axis feed in a range of 0.05 to 0.1 mm/t.
- When plunging, use peck-feed every 1 mm (or smaller than 1 mm) to break chips.
- tan*θ* = depth of cut: *a*p / length of tool pass: L
- In ramping, the ramping angle should be set within the maximum ramping angle.
- In helical feed hole machining, the machinable hole diameters are limited by the tool diameter as shown in the above tables.
- When machining between the minimum and maximum machining diameters, a projection remains in the center of the bottom surface of the hole as shown in the Figure at right. Remove it by traverse feed milling.

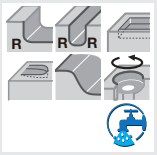
MEMO

## EWD05/07/10

Indexable endmills with buttom inserts of 2.5, 3.5, and 5 mm radius






| Designation | Max. ap | øDc | z | øD1 | øDs | ℓs | Lf | L | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| EWD05010R | 2.5 | 5 | 2 | 10 | 20 | 80 | 20 | 130 | with | RDMW05... |
| EWD05012R | 2.5 | 7 | 3 | 12 | 20 | 80 | 20 | 130 | with | RDMW05... |
| EWD07015R | 3.5 | 8 | 3 | 15 | 20 | 100 | 40 | 150 | with | RDMW07... |
| EWD05015R | 2.5 | 10 | 4 | 15 | 20 | 100 | 40 | 150 | with | RDMW05... |
| EWD10020R | 5.0 | 10 | 2 | 20 | 25 | 120 | 40 | 170 | with | RDMW10... |
| EWD07020R | 3.5 | 13 | 4 | 20 | 25 | 120 | 40 | 170 | with | RDMW07... |
| EWD05020R | 2.5 | 15 | 5 | 20 | 25 | 120 | 40 | 170 | with | RDMW05... |
| EWD10025R | 5.0 | 15 | 3 | 25 | 32 | 125 | 45 | 195 | with | RDMW10... |
| EWD07025R | 3.5 | 18 | 5 | 25 | 32 | 125 | 45 | 195 | with | RDMW07... |

### SPARE PARTS

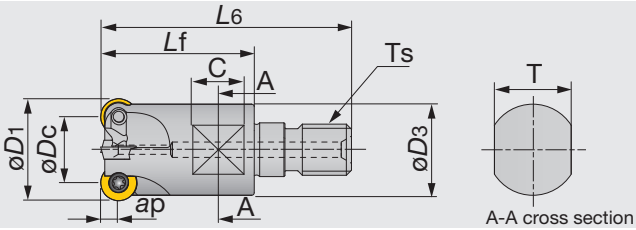
| Designation | Clamping screw | Lubricant | Wrench |
|---|---|---|---|
| EWD050**R | CSTD-1.8 | M-1000 | T-6D |
| EWD070**R | CSTB-2.5S | M-1000 | T-8D |
| EWD100**R | CSTB-3.5H | M-1000 | T-15D |



## HWD07-M

Indexable endmills with TungFlex, carrying buttom inserts of 3.5 mm radius









| Designation | Max. ap | øDc | z | øD1 | L6 | Lf | C | T | øD3 | Ts | Kg | Air hole |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HWD07R015MM08-03 | 3.5 | 8 | 3 | 15 | 42 | 25 | 8 | 10 | 12.8 | M8 | 0.03 | with |
| HWD07R020MM10-04 | 3.5 | 13 | 4 | 20 | 49 | 30 | 10 | 15 | 17.8 | M10 | 0.06 | with |
| HWD07R025MM12-05 | 3.5 | 18 | 5 | 25 | 57 | 35 | 10 | 17 | 20.8 | M12 | 0.1 | with |
| HWD07R030MM16-05 | 3.5 | 23 | 5 | 30 | 63 | 40 | 12 | 22 | 28.8 | M16 | 0.2 | with |

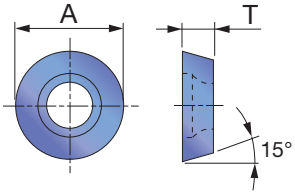
### SPARE PARTS

| Designation | Clamping screw | Lubricant | Wrench |
|---|---|---|---|
| HWD07-M... | CSTB-2.5S | M-1000 | T-8D |

## INSERT

### RDMW05/07/10






| | | | |
|---|---|---|---|
| P | Steel | ★ | |
| M | Stainless | | |
| K | Cast iron | ★ | |
| N | Non-ferrous | | |
| S | Superalloys | ★ | |
| H | Hard materials | | |

★ : First choice
☆ : Second choice

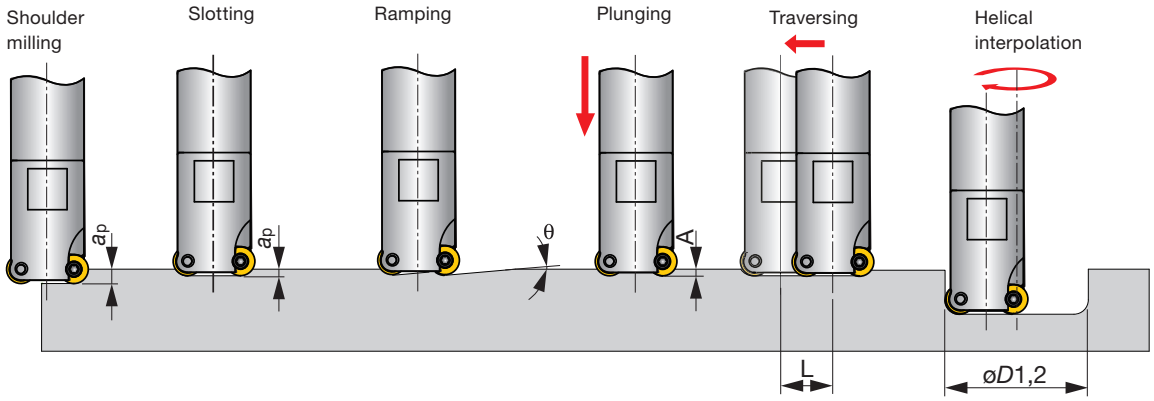
| Designation | Max. ap | Coating AH120 | A | T |
|---|---|---|---|---|
| RDMW0501M0 | 2.5 | ● | 5 | 1.4 |
| RDMW0702M0 | 3.5 | ● | 7 | 2.38 |
| RDMW1003M0 | 5.0 | ● | 10 | 3.18 |

●: Line-up

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Grade | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) | Depth of cut *ap* (mm) | | |
|---|---|---|---|---|---|---|---|
| | | | | | Cutter dia. ø10, 12 | Cutter dia. ø15, 20 | Cutter dia. ø25 |
| P | Carbon steels C45, etc. < 300 HB | AH120 | 200 ~ 500 | 0.15 ~ 0.45 | ~ 0.5 | ~ 0.7 | ~ 1 |
| P | Alloy steels 42CrMo4 etc. < 300 HB | AH120 | 120 ~ 350 | 0.15 ~ 0.35 | ~ 0.5 | ~ 0.7 | ~ 1 |
| P | Die steels X40CrMoV5-1 etc. < 300 HB | AH120 | 100 ~ 300 | 0.1 ~ 0.3 | ~ 0.5 | ~ 0.7 | ~ 1 |
| K | Cast irons 250, etc. | AH120 | 200 ~ 500 | 0.2 ~ 0.5 | ~ 0.5 | ~ 0.7 | ~ 1 |
| H | Hardened steels, Prehardened steels < 40HRC | AH120 | 70 ~ 200 | 0.1 ~ 0.25 | ~ 0.5 | ~ 0.7 | ~ 1 |

## APPLICATION RANGE




| Designation | Tool-ø | Max. depth of cut | Max. ramping | Max. plunging depth | Machining length for removing uncut portion | Max. machining | *Max. machining |
|---|---|---|---|---|---|---|---|
| | *øDc* | *ap* | *θ*° | A | L | *øD1* | *øD2* |
| HWD07R015MM08-03 | 15 | 3.5 | 25 | 2 | *ø*Dc - 6 | 23 | 28 |
| HWD07R020MM10-04 | 20 | 3.5 | 11 | 2 | *ø*Dc - 6 | 33 | 38 |
| HWD07R025MM12-05 | 25 | 3.5 | 7 | 2 | *ø*Dc - 6 | 43 | 48 |
| HWD07R030MM16-05 | 30 | 3.5 | 5.5 | 2 | *ø*Dc - 6 | 53 | 58 |

*For flat bottom hole



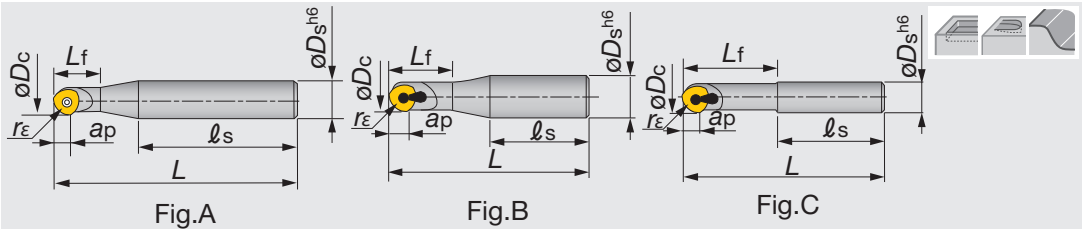



Fig.A Fig.B Fig.C

| Designation | Max. *ap* | *øDc* | z | *øDs* | *ℓs* | *Lf* | *L* | *rε* | Insert | Fig. |
|---|---|---|---|---|---|---|---|---|---|---|
| TBN1100S | 5 | 10 | 1 | 16 | 60 | 15 | 90 | 5 | ZNCA1002FN2 | A |
| TBN1120S | 6 | 12 | 1 | 16 | 70 | 20 | 110 | 6 | ZNCA1203FN | A |
| TBN1160S | 8 | 16 | 1 | 20 | 85 | 25 | 130 | 8 | ZNCA1603FN | A |
| TBN1200S | 10 | 20 | 1 | 25 | 100 | 35 | 160 | 10 | ZN**2004... | A |
| TBN1250S | 12.5 | 25 | 1 | 32 | 100 | 45 | 175 | 12.5 | ZN**2505... | B |
| TBN1300S | 15 | 30 | 1 | 32 | 100 | 90 | 190 | 15 | ZN**3005... | C |

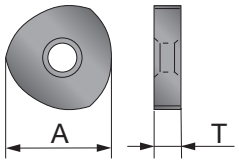
## SPARE PARTS

| Designation | Clamping screw | Clamp | Right-left screw | Wrench |
|---|---|---|---|---|
| TBN1100S | CSTB-2.5B | - | - | T-8D |
| TBN1120S | CSTB-3S | - | - | T-9D |
| TBN1160S | CSTB-4S | - | - | T-15D |
| TBN1200S | CSTA-5SS | - | - | T-15D |
| TBN1250S, 1300S | CSTA-5S | CP536 | DS-6T | T-15D |

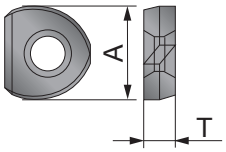


## INSERT

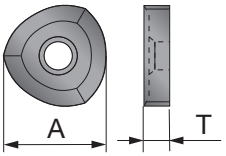
### ZNCA-FN




### ZNCA-FN2




### ZNMM-EN




| | | UX30 | TH10 | A | T |
|---|---|---|---|---|---|
| | | Uncoated | | | |
| P | Steel | ★ | | | |
| M | Stainless | | | | |
| K | Cast iron | | ★ | | |
| N | Non-ferrous | | ★ | | |
| S | Superalloys | | | | |
| H | Hard materials | | | | |
| Designation | | | | | |
| ZNCA1002FN2 | | ● | ● | 7.958 | 2.5 |
| ZNCA1203FN | | ● | ● | 9.735 | 3 |
| ZNCA1603FN | | ● | ● | 12.772 | 3.5 |
| ZNCA2004FN | | ● | ● | 15.862 | 4 |
| ZNCA2505FN | | ● | ● | 19.826 | 5 |
| ZNCA3005FN | | ● | ● | 23.618 | 5 |
| ZNMM2004EN | | ● | | 15.862 | 4 |
| ZNMM2505EN | | ● | | 19.826 | 5 |
| ZNMM3005EN | | ● | | 23.618 | 5.5 |

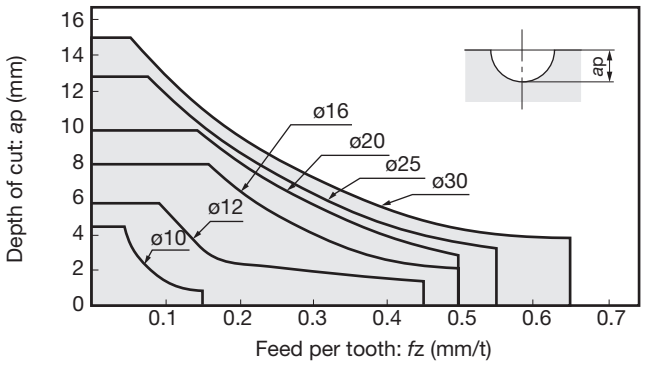
★ : First choice
☆ : Second choice
●: Line-up

## STANDARD CUTTING CONDITIONS

For finishing

| ISO | Workpiece material | Grade | Cutting Speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) | Pick feed *Pf* (mm) |
|---|---|---|---|---|---|
| P | High carbon steel C45, C55, etc. | UX30 | 80 - 120 | 0.1 - 0.3 | 0.3 - 0.5 |
| P | Tool steel X153CrMoV12, etc. | UX30 | 60 - 100 | 0.08 - 0.25 | 0.3 - 0.5 |
| K | Cast iron 250, 400-15S, etc. | TH10 | 80 - 120 | 0.1 - 0.5 | 0.3 - 0.5 |

## GUIDELINES FOR SELECTING DEPTH OF CUT AND FEED

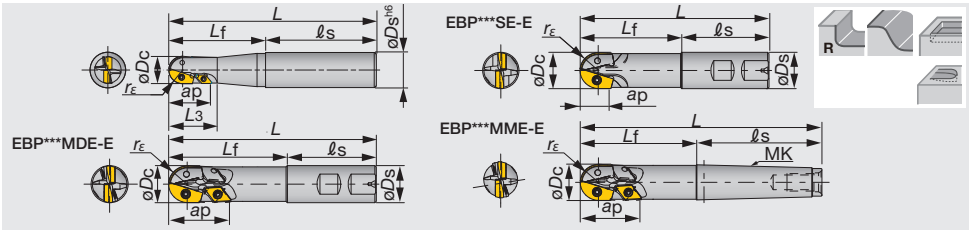



Workpiece material: Carbon steel (JIS S55C)
Insert grade: UX30
Machine power: ø10 ~ ø16: 7.5 kW
ø20 ~ ø30: 22.5 kW
No. of revolutions: ø10 ~ ø16: 2000 $min^{-1}$
ø20 ~ ø30: 1500 $min^{-1}$

## EBP

Indexable ball-nose endmill for semi-finishing





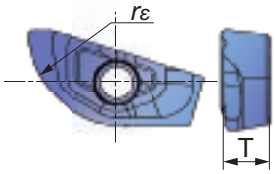

| Designation | Max. *ap* | øDc | z | øDs | ℓs | Lf | L | L3 | rε | MK | Insert 1 | Insert 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EBP020SD-E | 16 | 20 | 2 | 20 | 56 | 60 | 116 | - | 10 | - | ZPET2004-MJ | - |
| EBP020SS | 16 | 20 | 2 | 25 | 80 | 60 | 140 | 30 | 10 | - | ZPET2004-MJ | - |
| EBP020MDE-E | 29.5 | 20 | 2 (4) | 20 | 56 | 70 | 126 | - | 10 | - | ZPET2004-MJ | DCMW070204TN |
| EBP020MME-E | 29.5 | 20 | 2 (4) | - | 69 | 70 | 139 | - | 10 | MK2 | ZPET2004-MJ | DCMW070204TN |
| EBP020MSE | 29.5 | 20 | 2 (4) | 25 | 80 | 70 | 150 | 35 | 10 | - | ZPET2004-MJ | DCMW070204TN |
| EBP020LSE | 29.5 | 20 | 2 (4) | 25 | 180 | 70 | 250 | 35 | 10 | - | ZPET2004-MJ | DCMW070204TN |
| EBP025SD-E | 21 | 25 | 2 | 25 | 60 | 70 | 130 | - | 12.5 | - | ZPET2505-MJ | - |
| EBP025SS | 21 | 25 | 2 | 32 | 80 | 70 | 150 | 35 | 12.5 | - | ZPET2505-MJ | - |
| EBP025MDE-E | 41 | 25 | 2 (4) | 25 | 60 | 80 | 140 | - | 12.5 | - | ZPET2505-MJ | DCMW11T304TN |
| EBP025MME-E | 41 | 25 | 2 (4) | - | 86 | - | 166 | - | 12.5 | MK3 | ZPET2505-MJ | DCMW11T304TN |
| EBP025MSE | 41 | 25 | 2 (4) | 32 | 100 | 80 | 180 | 50 | 12.5 | | ZPET2505-MJ | DCMW11T304TN |
| EBP025LSE | 41 | 25 | 2 (4) | 32 | 220 | 80 | 300 | 50 | 12.5 | - | ZPET2505-MJ | DCMW11T304TN |
| EBP030SS | 24 | 30 | 2 | 32 | 80 | 80 | 160 | 40 | 15 | - | ZPET3006-MJ | - |
| EBP030MSE | 45 | 30 | 2 (4) | 32 | 100 | 100 | 200 | 55 | 15 | - | ZPET3006-MJ | DCMW11T304TN |
| EBP030LSE | 45 | 30 | 2 (4) | 32 | 250 | 100 | 350 | 55 | 15 | - | ZPET3006-MJ | DCMW11T304TN |
| EBP032SD-E | 25 | 32 | 2 | 32 | 60 | | 140 | - | 16 | - | ZPET3206-MJ | - |
| EBP032MDE-E | 46 | 32 | 2 (4) | 32 | 60 | 100 | 160 | - | 16 | - | ZPET3206-MJ | DCMW11T304TN |
| EBP032MME-E | 46 | 32 | 2 (4) | - | 109 | 100 | 209 | - | 16 | MK4 | ZPET3206-MJ | DCMW11T304TN |

### SPARE PARTS

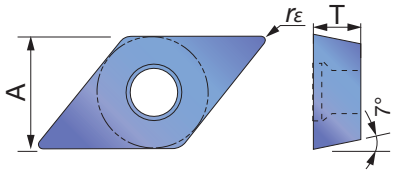
| Designation | Clamping screw for Insert 1 | Clamping screw for Insert 2 | Lubricant | Wrench for Insert 1 | Wrench 1 for Insert 1 |
|---|---|---|---|---|---|
| EBP020SS/SD-E | CSTD-3T | - | M-1000 | T-10D | - |
| EBP025SS/SD-E | CSTB-4S | - | M-1000 | T-15D | - |
| EBP030SS/032SD-E | CSTB-5S | - | M-1000 | T-20D | - |
| EBP020*SE/M*E-E | CSTB-2.5S | CSTD-3T | M-1000 | T-10D | T-8D |
| EBP025*SE/M*E-E | CSTB-4S | - | M-1000 | T-15D | - |
| EBP030*SE/032M*E-E | CSTB-4S | CSTB-5S | M-1000 | T-15D | T-20D |

## INSERT

### ZPET-MJ (for Radius)




### DCMW-TN (for Peripheral)




| | | AH120 | AH330 |
|---|---|---|---|
| P | Steel | ☆ | ★ |
| M | Stainless | | ★ |
| K | Cast iron | ★ | |
| N | Non-ferrous | | |
| S | Superalloys | ★ | |
| H | Hard materials | | |

★ : First choice
☆ : Second choice

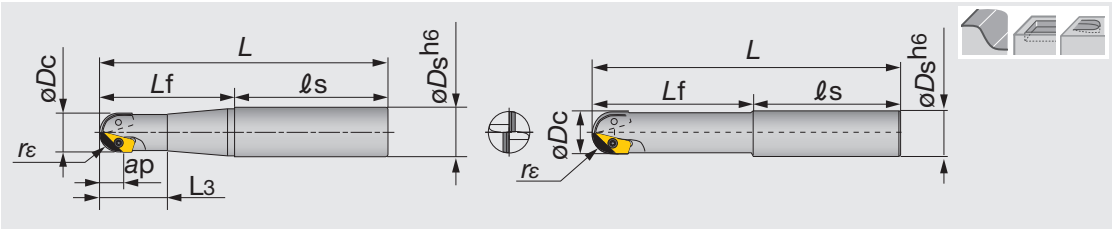
| Designation | rε | Coating AH120 | Coating AH330 | A | T |
|---|---|---|---|---|---|
| ZPET2004-MJ | 10 | ● | ● | - | 4.5 |
| ZPET2505-MJ | 12.5 | ● | ● | - | 4.63 |
| ZPET3006-MJ | 15 | ● | ● | - | 6.75 |
| ZPET3206-MJ | 16 | ● | ● | - | 6.75 |
| DCMW070204TN | 0.4 | ● | ● | 6.4 | 2.4 |
| DCMW11T304TN | 0.4 | ● | ● | 9.5 | 4 |

●: Line-up

## EBB

Indexable ball-nose endmill for semi-finishing with CBN insert





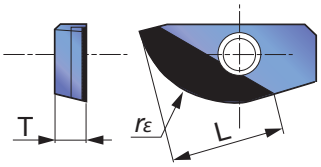

| Designation | Max. *ap* | *ø*D*c* | z | *ø*D*s* | *ℓ*s | *L*f | *L* | *L*3 | *r*ε | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| EBB020MS | 12 | 20 | 2 | 25 | 80 | 70 | 150 | 35 | 10 | ZPCW2003-QBN |
| EBB025MS | 15.5 | 25 | 2 | 32 | 100 | 80 | 180 | 50 | 12.5 | ZPCW25H3-QBN |
| EBB030MS | 18 | 30 | 2 | 32 | 100 | 100 | 200 | - | 15 | ZPCW30T3-QBN |
| EBB040MS | 23 | 40 | 2 | 42 | 100 | 150 | 250 | - | 20 | ZPCW4004-QBN |
| EBB050MS | 28 | 50 | 2 | 50 | 100 | 150 | 250 | - | 25 | ZPCW5004-QBN |

### SPARE PARTS

| Designation | Clamping screw | Lubricant | Wrench | Clamp set |
|---|---|---|---|---|
| EBB020MS | CSTB-3S | M-1000 | T-9D | - |
| EBB025MS | CSTB-3.5 | M-1000 | T-15D | - |
| EBB030MS | CSTB-4S | M-1000 | T-15D | - |
| EBB040MS | CSTB-5 | M-1000 | T-20D | CSP22 |
| EBB050MS | CSTB-5 | M-1000 | T-20D | CSP22 |

## INSERT

### ZPCW-QBN




| | | |
|---|---|---|
| P | Steel | |
| M | Stainless | |
| K | Cast iron | ★ |
| N | Non-ferrous | |
| S | Superalloys | |
| H | Hard materials | |

★ : First choice
☆ : Second choice

| Designation | *r*ε | CBN BX950 | T | L |
|---|---|---|---|---|
| ZPCW2003-QBN | 10 | ● | 3.18 | 12 |
| ZPCW25H3-QBN | 12.5 | ● | 3.5 | 15.5 |
| ZPCW30T3-QBN | 15 | ● | 3.97 | 18 |
| ZPCW4004-QBN | 20 | ● | 4.76 | 23 |
| ZPCW5004-QBN | 25 | ● | 4.76 | 28 |

●: Line-up

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | No. of revolutions *n* (min$^{-1}$) | Feed per tooth *fz* (mm/t) | Depth of cut *ap* (mm) | Pick feed *Pf* (mm) |
|---|---|---|---|---|---|
| K | Cast irons 250, etc. | 5,000 ~ 15,000 | 0.2 ~ 0.5 | ~ 1 | ~ 3 |
| | Ductile cast irons 600-3, etc. | 5,000 ~ 15,000 | 0.2 ~ 0.5 | ~ 1 | ~ 3 |

## EBD

Indexable ball-nose endmill for roughing

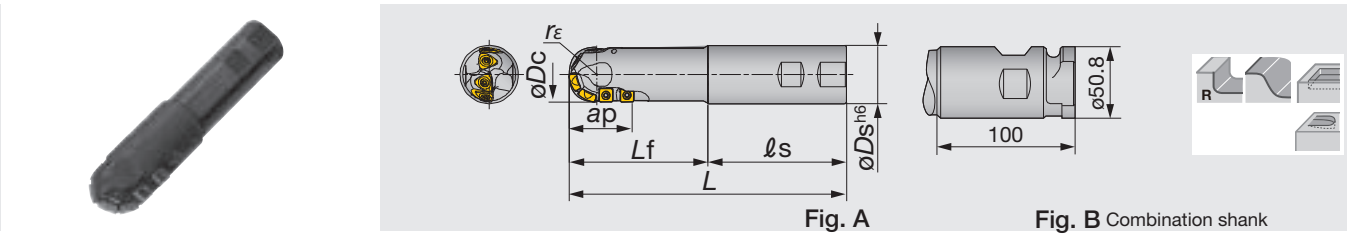



Fig. A

Fig. B Combination shank

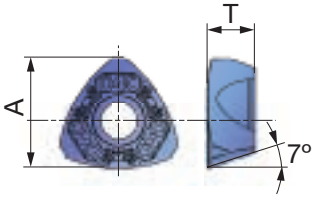
| Designation | Max. *ap* | ø*Dc* | z | ø*Ds* | *ℓs* | *Lf* | *L* | *rε* | Fig. | Insert for R | Insert for P |
|---|---|---|---|---|---|---|---|---|---|---|---|
| EBD040SSE | 45 | 40 | 4 (7) | 42 | 100 | 100 | 200 | 20 | A | ZDMT4005-MJ | SCMT09T308-23 |
| EBD040MSE | 45 | 40 | 4 (7) | 42 | 100 | 150 | 250 | 20 | A | ZDMT4005-MJ | SCMT09T308-23 |
| EBD050SSE | 59 | 50 | 4 (7) | 42 | 100 | 100 | 200 | 25 | A | ZDMT5006-MJ | SCMT120408-23 |
| EBD050MSE | 59 | 50 | 4 (7) | 42 | 100 | 150 | 250 | 25 | A | ZDMT5006-MJ | SCMT120408-23 |
| EBD050SCE | 59 | 50 | 4 (7) | 50.8 | 100 | 100 | 200 | 25 | B | ZDMT5006-MJ | SCMT120408-23 |
| EBD050MCE | 59 | 50 | 4 (7) | 50.8 | 100 | 150 | 250 | 25 | B | ZDMT5006-MJ | SCMT120408-23 |

### SPARE PARTS

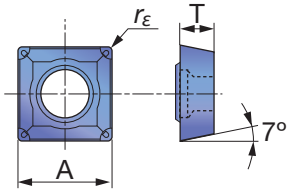
| Designation | Clamping screw | Lubricant | Wrench |
|---|---|---|---|
| EBD040*SE | CSTB-4M | M-1000 | T-15T |
| EBD050**E | CSTB-5 | M-1000 | T-20T |

## INSERT

### ZDMT-MJ (For R-edge)




### SCMT-23 (For peripheral edge)




| | | |
|---|---|---|
| P | Steel | ☆ |
| M | Stainless | |
| K | Cast iron | ★ |
| N | Non-ferrous | |
| S | Superalloys | ★ |
| H | Hard materials | ☆ |

★ : First choice
☆ : Second choice

| Designation | *rε* | Coating AH120 | A | T |
|---|---|---|---|---|
| ZDMT4005-MJ | - | ● | 13 | 5.5 |
| ZDMT5006-MJ | - | ● | 16.2 | 6.5 |
| SCMT09T308-23 | 0.8 | ● | 9.525 | 3.97 |
| SCMT120408-23 | 0.8 | ● | 12.7 | 4.76 |

●: Line-up

# STANDARD CUTTING CONDITIONS

## EBP

| ISO | Workpiece material | Grade | Machining type | Cutting speed *Vc* (m/min) | Table feed *vf* (mm/min) Tool dia. ø20 | Tool dia. ø25 | Tool dia. ø30 |
|---|---|---|---|---|---|---|---|
| P | Carbon steels C55, etc. < 300 HB | AH120 | (1) | 200 (170 ~ 230) | 760 (610 ~ 910) | 610 (460 ~ 760) | 510 (360 ~ 660) |
| | | AH120 | (2) | 230 (200 ~ 260) | 1100 (900 ~ 1300) | 880 (680 ~ 1080) | 730 (530 ~ 930) |
| | | AH120 | (3) | 180 (150 ~ 200) | 570 (420 ~ 350) | 460 (310 ~ 610) | 380 (230 ~ 530) |
| | Alloy steels 42CrMo4, etc. < 300 HB | AH120 | (1) | 180 (150 ~ 210) | 680 (530 ~ 830) | 550 (400 ~ 700) | 450 (300 ~ 600) |
| | | AH120 | (2) | 210 (180 ~ 240) | 1000 (800 ~ 1200) | 800 (600 ~ 400) | 670 (470 ~ 870) |
| | | AH120 | (3) | 160 (130 ~ 180) | 510 (360 ~ 660) | 400 (250 ~ 550) | 340 (190 ~ 490) |
| | Die steels X96CrMoV12, etc. < 300 HB | AH330 | (1) | 150 (120 ~ 180) | 570 (420 ~ 720) | 460 (310 ~ 610) | 380 (230 ~ 530) |
| | | AH330 | (2) | 180 (150 ~ 210) | 860 (660 ~ 1060) | 690 (490 ~ 890) | 570 (370 ~ 770) |
| | | AH330 | (3) | 130 (100 ~ 150) | 410 (260 ~ 560) | 330 (180 ~ 480) | 280 (130 ~ 430) |
| K | Cast irons 250, etc. | AH120 | (1) | 200 (170 ~ 230) | 950 (800 ~ 1100) | 760 (610 ~ 910) | 640 (490 ~ 790) |
| | | AH120 | (2) | 230 (200 ~ 260) | 1200 (900 ~ 1400) | 1000 (700 ~ 1200) | 830 (530 ~ 1030) |
| | | AH120 | (3) | 180 (150 ~ 200) | 570 (420 ~ 720) | 460 (310 ~ 610) | 380 (230 ~ 530) |
| H | Hardened steels Prehardened steels < 45 HRC | AH120 | (1) | 80 (60 ~ 100) | 250 (150 ~ 350) | 200 (100 ~ 300) | 160 (100 ~ 260) |
| | | AH120 | (2) | 100 (70 ~ 130) | 310 (160 ~ 460) | 250 (100 ~ 400) | 210 (100 ~ 360) |
| | | AH120 | (3) | 60 (40 ~ 80) | 190 (140 ~ 240) | 150 (100 ~ 200) | 130 (80 ~ 180) |

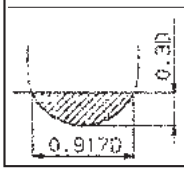
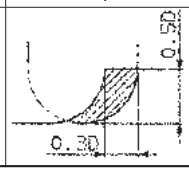
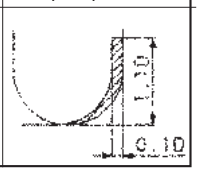
Notes:
- Cutting speeds shown in the left table are of the most outer diameter of the tool.
- The values of the cutting speeds and feeds shown in the table are of under general cutting conditions. The values should be modified depending on the power and rigidity of the machine to be used, and work holding conditions.
- When using the long shank type, the depth of cut, pick feed, cutting speed, and table feed should be reduced to 70 %-90 % of the values shown in the tables.

## EBD

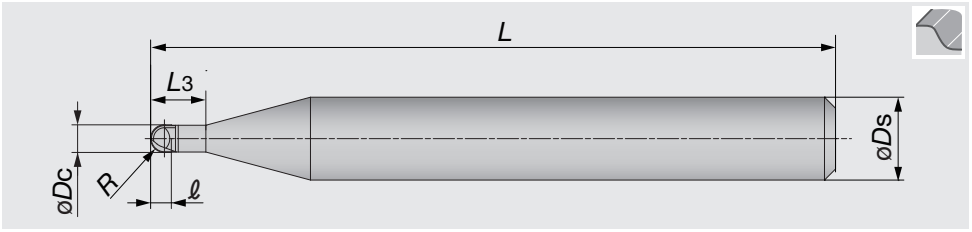
| ISO | Workpiece material | Grade | Machining type | Cutting speed *Vc* (m/min) | Table feed *vf* (mm/min) Tool dia. ø40 | Tool dia. ø50 |
|---|---|---|---|---|---|---|
| P | Carbon steels C55, etc. < 300 HB | AH120 | (1) | 180 (150 ~ 210) | 490 (400 ~ 570) | 390 (330 ~ 460) |
| | | AH120 | (2) | 200 (170 ~ 230) | 480 (410 ~ 550) | 380 (330 ~ 440) |
| | | AH120 | (3) | 160 (130 ~ 190) | 260 (210 ~ 300) | 200 (160 ~ 240) |
| | Alloy steels 42CrMo4, etc. < 300 HB | AH120 | (1) | 160 (130 ~ 190) | 430 (350 ~ 510) | 350 (280 ~ 410) |
| | | AH120 | (2) | 180 (150 ~ 210) | 430 (360 ~ 500) | 340 (290 ~ 400) |
| | | AH120 | (3) | 140 (110 ~ 170) | 220 (180 ~ 270) | 180 (140 ~ 220) |
| | Die steels X96CrMoV12, etc. < 300 HB | AH120 | (1) | 140 (110 ~ 170) | 380 (300 ~ 460) | 300 (240 ~ 370) |
| | | AH120 | (2) | 160 (130 ~ 190) | 380 (310 ~ 460) | 310 (250 ~ 360) |
| | | AH120 | (3) | 120 (90 ~ 150) | 190 (140 ~ 240) | 150 (120 ~ 190) |
| K | Cast irons 250, etc. | AH120 | (1) | 200 (170 ~ 230) | 640 (510 ~ 680) | 510 (410 ~ 540) |
| | | AH120 | (2) | 220 (190 ~ 250) | 600 (510 ~ 680) | 480 (410 ~ 540) |
| | | AH120 | (3) | 180 (150 ~ 210) | 340 (290 ~ 400) | 280 (230 ~ 320) |
| H | Hardened steels Prehardened steels < 45 HRC | AH120 | (1) | 90 (70 ~ 110) | 210 (160 ~ 260) | 170 (130 ~ 210) |
| | | AH120 | (2) | 100 (80 ~ 120) | 200 (160 ~ 250) | 160 (130 ~ 200) |
| | | AH120 | (3) | 60 (50 ~ 90) | 100 (80 ~ 140) | 80 (60 ~ 120) |

Notes:
- Cutting speeds shown in the left table are of the most outer diameter of the tool.
- The values of the cutting speeds and feeds shown in the table are of under general cutting conditions. The values should be modified depending on the power and rigidity of the machine to be used, and work holding conditions.
- When using the long shank type, the depth of cut, pick feed, cutting speed, and table feed should be reduced to 70 %-90 % of the values shown in the tables.

## Machining types

| (1) Grooving | (2) Shouldering at shallow depth of cut | (3) Shouldering at deep depth of cut |
|---|---|---|
|  |  |  |






| Designation | BX850 | z | R | øDc | ℓ | L3 | L | øDs |
|---|---|---|---|---|---|---|---|---|
| BBB2006 | ● | 2 | 0.3 | 0.6 | 0.5 | 1.2 | 50 | 6 |
| BBB2008 | ● | 2 | 0.4 | 0.8 | 0.6 | 1.6 | 50 | 6 |
| BBB2010 | ● | 2 | 0.5 | 1 | 0.7 | 2 | 50 | 6 |
| BBB2020 | ● | 2 | 1 | 2 | 1.5 | 4 | 50 | 6 |

●: Line-up

## Tolerance (BBB2000)

| Mill dia. | Tolerance on dia. | Tolerance on shank |
|---|---|---|
| 0.3 ~ 1.0 | ±0.005 | h6 |

## ●BBB2000 (T-CBN Ball Endmills)

| Workpiece material | Prehardened steels (NAK80, etc.) Die steels (JIS SKD61, etc.) | | | Die steels (JIS SKD11, DRM1 & 2, etc.) | | | High speed steel and die steel (JIS SKH, DRM3, etc.) | | | Inclined angle of workpiece (θ1)/ Effective neck length (Z) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | ~ 52 HRC | | | ~ 62 HRC | | | ~ 70 HRC | | | | | | |
| Ball radius (R) | Depth of cut ap ~ pf (mm) | Feed rate (mm/min) | No. of revolutions n (min-1) | Depth of cut ap ~ pf (mm) | Feed rate (mm/min) | No. of revolutions n (min-1) | Depth of cut ap ~ pf (mm) | Feed rate (mm/min) | No. of revolutions n (min-1) | | | | |
| 0.3 | 0.02×0.03 | 2,000 | 50,000 | 0.01×0.02 | 2,000 | 50,000 | 0.01×0.02 | 1,500 | 50,000 | 0°30′/1.25 | 1°/1.30 | 2°/1.35 | 3°/1.45 |
| 0.4 | 0.03×0.05 | 2,000 | | 0.02×0.03 | 2,000 | | 0.01×0.03 | 1,500 | | 0°30′/1.65 | 1°/1.70 | 2°/1.80 | 3°/1.90 |
| 0.5 | 0.05×0.05 | 3,000 | | 0.03×0.05 | 3,000 | | 0.02×0.03 | 2,000 | | 0°30′/2.05 | 1°/2.10 | 2°/2.25 | 3°/2.40 |
| 1.0 | 0.10×0.10 | 5,000 | | 0.05×0.05 | 5,000 | | 0.03×0.05 | 3,000 | | 0°30′/4.15 | 1°/4.25 | 2°/4.50 | 3°/4.80 |

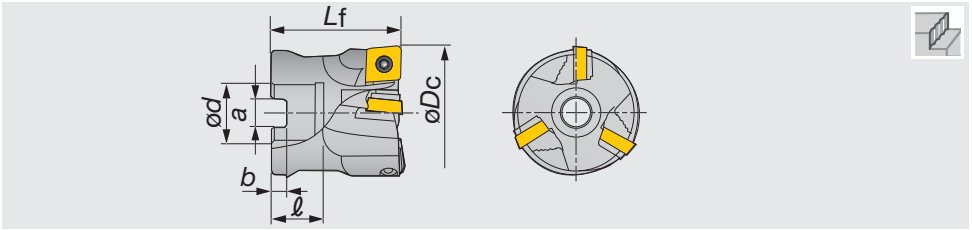
Notes:
- Depths of cut (*ap*) shown in the table are the allowable maximum values.
- Mist cooling or air blow is recommended.
- The maximum number of revolutions of the machine to be used is lower than 50,000 $min^{-1}$, the revolutions and feed rate should be modified at same rate.
- Use smallest possible overhang.

MEMO

## TZP12

Plunging cutter for roughing operation with screw clamp

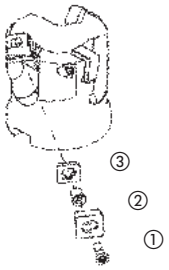





| Designation | øDc | z | ød | ℓ | Lf | b | a | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|
| TZP12050R-E | 50 | 3 | 22 | 20 | 50 | 6.3 | 10.4 | 0.38 | APMT120416PR-MJ |
| TZP12063R-E | 63 | 3 | 22 | 20 | 50 | 6.3 | 10.4 | 0.72 | APMT120416PR-MJ |

### SPARE PARTS

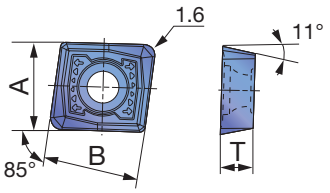
| Designation | ①Clamping screw | Lubricant | ②Shim screw | ③Shim | Wrench (①) | Wrench 1 (②) |
|---|---|---|---|---|---|---|
| TZP12 | CSTB-3.5T | M-1000 | DTS5-3.5SS | ZSA1102 | T-20D | P-3.5 |






## INSERT

### APMT120416-MJ




| | | | |
|---|---|---|---|
| P | Steel | ☆ | ★ |
| M | Stainless | | |
| K | Cast iron | ★ | |
| N | Non-ferrous | | |
| S | Superalloys | ★ | |
| H | Hard materials | | |

★ : First choice
☆ : Second choice

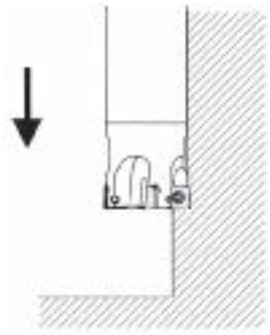
| Designation | rε | Max. ap | Coating AH120 | Coating T3130 | A | B | T |
|---|---|---|---|---|---|---|---|
| APMT120416PR-MJ | 1.6 | 10 | ● | ● | 12.7 | 13.5 | 4.76 |

●: Line-up

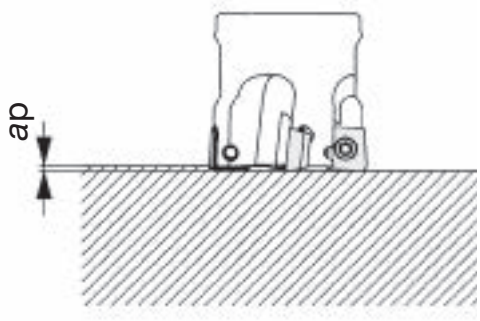
## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Grade | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) |
|---|---|---|---|---|
| P | Carbon steels, Alloy steels | AH120 | 100 ~ 200 | 0.1 ~ 0.3 |
| | | T3130 | 150 ~ 250 | 0.1 ~ 0.25 |
| | Die steels < 300 HB | AH120 | 100 ~ 200 | 0.1 ~ 0.3 |
| | | T3130 | 150 ~ 250 | 0.1 ~ 0.25 |
| | Prehardened steels < 45 HRC | AH120 | 60 ~ 120 | 0.1 ~ 0.2 |
| K | Cast irons | AH120 | 100 ~ 200 | 0.1 ~ 0.3 |

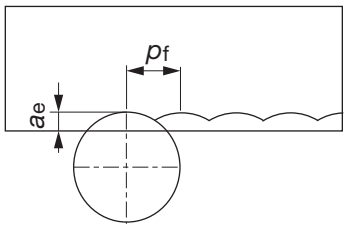
### Z-feed milling



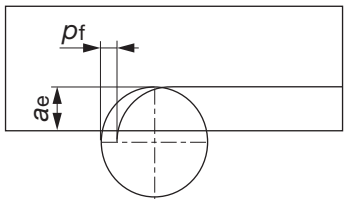
### Traverse feed milling




### Machining method (1)




### Machining method (2)



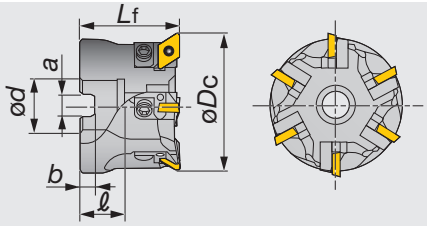

| Machining method | Z-feed milling | | Traverse feed milling |
|---|---|---|---|
| | Pick feed $p_f$ (mm) | Radial depth of cut *ae* (mm) | Depth of cut *ap* (mm) |
| (1) | Tool dia. øD/2 | Within effective cutting edge length | ~ 0.5 |
| (2) | Within effective cutting edge length | Tool dia. øD/2 | |

Note: In Z-feed milling, select either of the machining method (1) or (2) and decide the depth of cut according to the application.

## TZF11

Plunging cutter for finishing operation

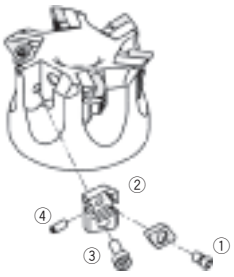





| Designation | z | øDc | ød | ℓ | Lf | b | a | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|
| TZF11050R-E | 4 | 50 | 22 | 20 | 45 | 6.3 | 10.4 | 0.38 | DPCW11T3ZFR |
| TZF11063R-E | 6 | 63 | 22 | 20 | 45 | 6.3 | 10.4 | 0.72 | DPCW11T3ZFR |

### SPARE PARTS

| Designation | ①Clamping screw | ②Locator | Lubricant | ③Cartridge fixing screw | ④Cartridge fixing screw | Shell locking bolt | Wrench (①) | Wrench 1 (④) | Wrench 2 (③) |
|---|---|---|---|---|---|---|---|---|---|
| TZF11050R* | CSTB-4S | SDUPR09CZ-11 | M-1000 | CM4X0.7X12 | SSHM3-10 | FSHM10-40 | T-15D | P-1.5 | P-3 |
| TZF11063R* | CSTB-4S | SDUPR09CZ-11 | M-1000 | CM4X0.7X12 | SSHM3-10 | - | T-15D | P-1.5 | P-3 |

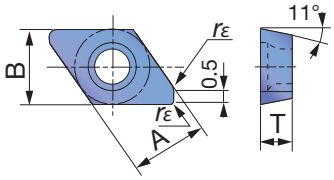





## INSERT

### DPCW11T3

Precious ground insert for finishing with plunging tool




| | | | | | | |
|---|---|---|---|---|---|---|
| P | Steel | ☆ | ☆ | | ★ | |
| M | Stainless | | ★ | | | |
| K | Cast iron | ★ | | | | |
| N | Non-ferrous | | | | | |
| S | Superalloys | | | | | |
| H | Hard materials | | | | ☆ | |

★ : First choice
☆ : Second choice

| Designation | rε | Coating | | | Cermet | | A | B | T |
|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH740 | | NS740 | | | | |
| DPCW11T3ZFR | 1 | ● | ● | | ● | | 9.5 | 9.5 | 4 |

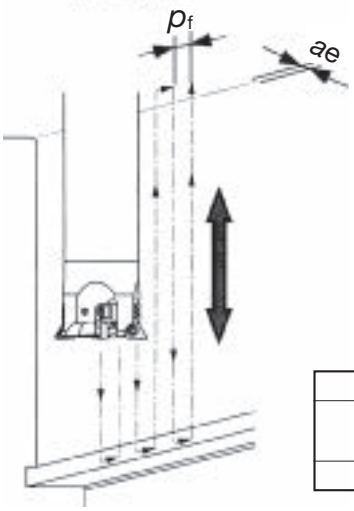
●: Line-up

## STANDARD CUTTING CONDITIONS

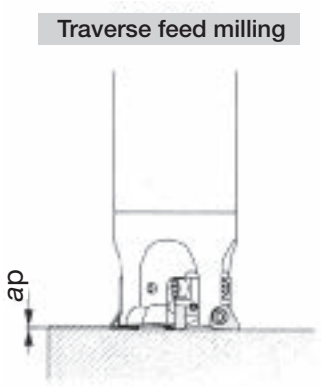
| ISO | Workpiece material | Grade | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) |
|---|---|---|---|---|
| P | Carbon steels, Alloy steels < 300 HB | NS740 | 300 (150 ~ 400) | 0.15 (0.05 ~ 0.2) |
| | | AH740 | 250 (150 ~ 350) | 0.15 (0.05 ~ 0.2) |
| K | Cast irons 250, etc. | AH740 | 300 (200 ~ 500) | 0.15 (0.05 ~ 0.2) |
| | Ductile cast irons 600-3, etc. | AH740 | 250 (150 ~ 350) | 0.15 (0.05 ~ 0.2) |
| H | Prehardened steels, Hard materials 40-55 HRC | AH740 | 150 (100 ~ 200) | 0.1 (0.05 ~ 0.15) |

- Dry cutting (or air blow) at a depth of cut up *ae* to 0.3 mm (allowable max. 0.5 mm) and a pick feed *pf* from 0.5 to 1.0 mm is recommended.
- TZF11 type cutters are not designed to adjust dynamic balance. Therefore, when the tool's overhang ratio (cutter diameter-to-length) exceeds 6:1, special care should be taken with the revolution speed. (At first, start the machining at 50 % of the speed shown in the table of the standard cutting conditions, and then gradually increase the speed whilst confirming safety.)
- To produce highly accurate surface finish, use the cutter on a machine with sufficient rigidity.

Z-feed milling




Traverse feed milling




| Z-feed milling | | Traverse feed milling |
|---|---|---|
| Pick feed $p_f$ (mm) | Radial depth of cut *ae* (mm) | Depth of cut *ap* (mm) |
| 0.5 ~ 1 | ~ 0.5 | ~ 0.5 |

### ●Cautionary points in use

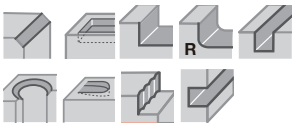
- Use the cutter for finish milling of vertical wall surfaces requiring long tool-overhang of L/D > 6.
- Radial cutting edge run-out should be adjusted within 0.01 mm.
- In addition to Z-feed milling, TZF11 type cutters can be also used for traverse feed milling. (*ap* ≤ 0.5 mm)



## TUNGMEISTER

Endmills with exchangeable heads for reduced tool change time

**ø6 mm - ø25 mm**



D226

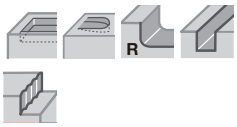
P M K N S H



## HYBRIDTACMILL

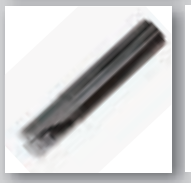
Multi-functional endmills

**ø10 mm - ø16 mm / max. ap 8 mm**



D254

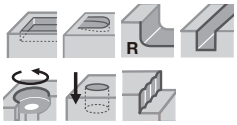
P M K N



## EVX

Multi-functional endmills in larger diameters

**ø16 mm - ø63 mm / max. ap 15 mm**



D257

P M K



## ECC

Chamfering endmills for large lengths

**ø34 mm - ø55 mm**



D260

P M K



## ECP

Chamfering endmills for small lengths

**ø10 mm - ø36 mm**



D262

P K



## TCB

Counter boring tool for flat bottom finish

**ø14 mm - ø43 mm**



D263

P M K



## Thread Milling

Threading tool with a single indexable insert

**M28 - M90**



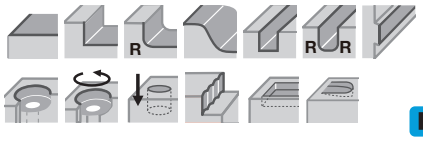
D265

P M



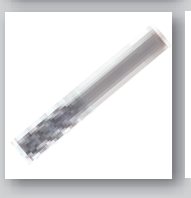
## TMS

High rigidity modular system



D267

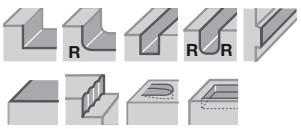
P M K N H



## Solid Endmill

Solid carbide endmills for various applications

**ø0.4 mm - ø25 mm**



D274

P M K N S H



TUNGMEISTER

# Designation system

## Shank

| V | SS | D10 | L070 | S | 06 | - | W | - | A |
|---|---|---|---|---|---|---|---|---|---|
| ① | ② | ③ | ④ | ⑤ | ⑥ | | ⑦ | | ⑧ |

| ① Series | |
|---|---|
| V | TungMeister |

| ② Shank type | |
|---|---|
| SS | Straight neck |
| TS | Taper neck |
| SC | Slotting |
| ST | for T-Slotting |
| AD | TungFlex adapter |

| ③ Shank diameter (mm) | |
|---|---|
| D08 | ø8 |
| D10 | ø10 |
| D12 | ø12 |
| D16 | ø16 |
| D20 | ø20 |
| D25 | ø25 |
| D32 | ø32 |
| VSC, VAD type | |
| 100 | ø10 |
| 120 | ø12 |
| 130 | ø13 |
| 180 | ø18 |
| 210 | ø21 |

| ④ Length (mm) | |
|---|---|
| L070 | 70 |

| ⑤ Shape of shank | |
|---|---|
| S | Cylindrical |
| W | Weldon |

| ⑥ Connection screw size | |
|---|---|
| 05 | S05 |
| 06 | S06 |
| 08 | S08 |
| 10 | S10 |
| 12 | S12 |
| 15 | S15 |

| ⑦ Shank material | |
|---|---|
| S | Steel |
| C | Carbide |
| W | Tungsten |

| ⑧ Additional feature | |
|---|---|
| A | with coolant hole |
| M | Thread size (TungFlex adapters) |

## Head

### ● Square endmill

| V | E | E | 080 | L05.0 | R00 | - | 03 | S05 |
|---|---|---|---|---|---|---|---|---|
| ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ | ⑧ | ⑨ |

### ● Ball nose endmill

| V | B | D | 200 | L15.0 | - | BG | - | 04 | S12 |
|---|---|---|---|---|---|---|---|---|---|
| ① | ② | ③ | ④ | ⑤ | | ⑥ | ⑦ | ⑧ | ⑨ |

| ① Series | |
|---|---|
| V | TungMeister |

| ② Cutting edge | |
|---|---|
| E | Square |
| B | Ball |
| R | Radius |
| FX | for high feed |
| CA | for chamfering |
| CP | Spot drilling |
| CW | for chamfering (front and back) |
| CR | for R chamfering |
| GC | for counter boring |
| DP | for center drilling |
| S | for slotting |
| T | for T-slot milling |

| ③ Helix angle / Rake face | |
|---|---|
| B | 0° |
| C | 15° |
| D | 30° |
| E | 38° ~ 50° |
| F | 60° |
| T | Land |

| ④ Diameter (mm) | |
|---|---|
| 060 | ø6 |
| 200 | ø20 |

| ⑤ Cutting edge length (mm) | |
|---|---|
| Length | |
| L07.0 | 7 |
| L15.0 | 15 |
| Groove width | |
| W1.50 | 1.5 |
| W1.57 | 1.57 |
| W10.0 | 10 |

| ⑥ Corner shape / Angle | |
|---|---|
| Nose radius | |
| R00 | Sharp edge |
| R005 | R0.05 |
| R01 | R0.1 |
| R05 | R0.5 |
| R10 | R1.0 |
| Chamfer type | |
| C15 | 0.15 x 45° |
| C30 | 0.3 x 45° |
| C60 | 0.6 x 45° |
| Chamfering head | |
| A30 | 30° |
| A60 | 60° |
| R chamfering head | |
| R10 | R1.0 |
| R16 | R1.6 |
| Ball nose | |
| SG | Sphere / high precision |
| BM | Ball / general purpose |
| BG | Ball / high precision |

| ⑦ Additional feature | |
|---|---|
| I | Irregular pitch |
| A | for aluminium |
| R | for roughing |
| C | Combined edge |

| ⑧ The number of flutes | |
|---|---|
| General | |
| 02 | 2 |
| 06 | 6 |
| Grooving head VST type | |
| 3 | 3 |
| 4 | 4 |

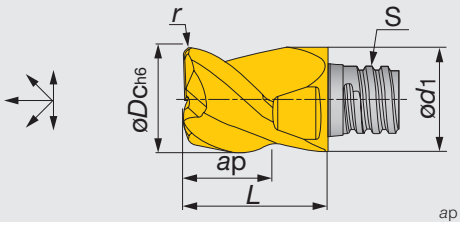
| ⑨ Connection screw size | |
|---|---|
| S05 | S05 |
| S06 | S06 |
| S08 | S08 |
| S10 | S10 |
| S12 | S12 |
| S15 | S15 |

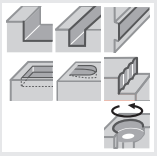
# TUNGMEISTER

## VEE**-03...

TungMeister square head with 3 flutes for general purpose





ap = Max. depth of cut, S = Connection screw size

| Designation | AH725 | z | Helx | øDc | ød1 | Max. ap | r | S | L | Wrench | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VEE080L05.0R00-03S05 | ● | 3 | 45° | 8 | 7.7 | 5 | - | S05 | 10 | KEYV-S05 | 7 |
| VEE100L07.0R00-03S06 | ● | 3 | 45° | 10 | 9.7 | 7 | - | S06 | 13 | KEYV-S06 | 10 |
| VEE120L09.0R00-03S08 | ● | 3 | 45° | 12 | 11.70 | 9 | - | S08 | 16.5 | KEYV-S08 | 15 |

*Torque: Recommended torque (Nm) for clamping.
Packing quantity = 2 pcs.

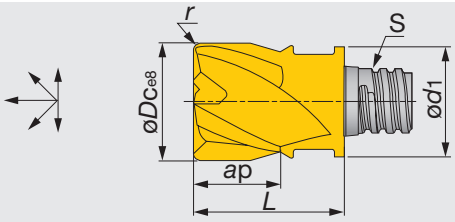
●: Line-up

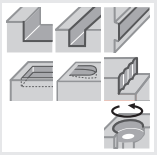
# TUNGMEISTER

## VED**-04..., VEE**-04...

TungMeister square head with 4 flutes for general purposes





ap = Max. depth of cut, S = Connection screw size

| Designation | AH725 | z | Helx | øDc | ød1 | Max. ap | r | S | L | Wrench | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VEE060L05.0R00-04S05 | ● | 4 | 45° | 6 | 8 | 5 | - | S05 | 10 | KEYV-S05 | 7 |
| VEE080L05.0R00-04S05 | ● | 4 | 45° | 8 | 7.7 | 5 | - | S05 | 10 | KEYV-S05 | 7 |
| VED080L05.0R05-04S05 | ● | 4 | 30° | 8 | 7.7 | 5 | 0.5 | S05 | 10 | KEYV-S05 | 7 |
| VED080L05.0R10-04S05 | ● | 4 | 30° | 8 | 7.7 | 5 | 1 | S05 | 10 | KEYV-S05 | 7 |
| VED080L05.0R15-04S05 | ● | 4 | 30° | 8 | 7.7 | 5 | 1.5 | S05 | 10 | KEYV-S05 | 7 |
| VEE100L07.0R00-04S06 | ● | 4 | 45° | 10 | 9.7 | 7 | - | S06 | 13 | KEYV-S06 | 10 |
| VED100L07.0R05-04S06 | ● | 4 | 30° | 10 | 9.7 | 7 | 0.5 | S06 | 13 | KEYV-S06 | 10 |
| VEE100L07.0R05-04S06 | ● | 4 | 45° | 10 | 9.7 | 7 | 0.5 | S06 | 13 | KEYV-S06 | 10 |
| VED100L07.0R10-04S06 | ● | 4 | 30° | 10 | 9.7 | 7 | 1 | S06 | 13 | KEYV-S06 | 10 |
| VEE100L07.0R10-04S06 | ● | 4 | 45° | 10 | 9.7 | 7 | 1 | S06 | 13 | KEYV-S06 | 10 |
| VEE120L09.0R00-04S08 | ● | 4 | 45° | 12 | 11.7 | 9 | - | S08 | 16.5 | KEYV-S08 | 15 |
| VED120L09.0R05-04S08 | ● | 4 | 30° | 12 | 11.7 | 9 | 0.5 | S08 | 16.5 | KEYV-S08 | 15 |
| VEE120L09.0R05-04S08 | ● | 4 | 45° | 12 | 11.7 | 9 | 0.5 | S08 | 16.5 | KEYV-S08 | 15 |
| VED120L09.0R10-04S08 | ● | 4 | 30° | 12 | 11.7 | 9 | 1 | S08 | 16.5 | KEYV-S08 | 15 |
| VEE120L09.0R10-04S08 | ● | 4 | 45° | 12 | 11.7 | 9 | 1 | S08 | 16.5 | KEYV-S08 | 15 |
| VEE160L12.0R00-04S10 | ● | 4 | 45° | 16 | 15.3 | 12 | - | S10 | 20.5 | KEYV-S10 | 28 |
| VED160L12.0R05-04S10 | ● | 4 | 30° | 16 | 15.3 | 12 | 0.5 | S10 | 20.5 | KEYV-S10 | 28 |
| VEE160L12.0R05-04S10 | ● | 4 | 45° | 16 | 15.3 | 12 | 0.5 | S10 | 20.5 | KEYV-S10 | 28 |
| VED160L12.0R10-04S10 | ● | 4 | 30° | 16 | 15.3 | 12 | 1 | S10 | 20.5 | KEYV-S10 | 28 |
| VEE160L12.0R10-04S10 | ● | 4 | 45° | 16 | 15.3 | 12 | 1 | S10 | 20.5 | KEYV-S10 | 28 |
| VED160L12.0R15-04S10 | ● | 4 | 30° | 16 | 15.3 | 12 | 1.5 | S10 | 20.5 | KEYV-S10 | 28 |
| VEE160L12.0R15-04S10 | ● | 4 | 45° | 16 | 15.3 | 12 | 1.5 | S10 | 20.5 | KEYV-S10 | 28 |
| VED160L12.0R20-04S10 | ● | 4 | 30° | 16 | 15.3 | 12 | 2 | S10 | 20.5 | KEYV-S10 | 28 |
| VEE160L12.0R20-04S10 | ● | 4 | 45° | 16 | 15.3 | 12 | 2 | S10 | 20.5 | KEYV-S10 | 28 |
| VED160L12.0R30-04S10 | ● | 4 | 30° | 16 | 15.3 | 12 | 3 | S10 | 20.5 | KEYV-S10 | 28 |
| VEE160L12.0R30-04S10 | ● | 4 | 45° | 16 | 15.3 | 12 | 3 | S10 | 20.5 | KEYV-S10 | 28 |
| VED160L12.0R40-04S10 | ● | 4 | 30° | 16 | 15.3 | 12 | 4 | S10 | 20.5 | KEYV-S10 | 28 |
| VEE160L12.0R40-04S10 | ● | 4 | 45° | 16 | 15.3 | 12 | 4 | S10 | 20.5 | KEYV-S10 | 28 |
| VEE200L15.0R00-04S12 | ● | 4 | 45° | 20 | 18.3 | 15 | - | S12 | 25.5 | KEYV-S12 | 28 |
| VED200L15.0R05-04S12 | ● | 4 | 30° | 20 | 18.3 | 15 | 0.5 | S12 | 25.5 | KEYV-S12 | 28 |
| VED200L15.0R10-04S12 | ● | 4 | 30° | 20 | 18.3 | 15 | 1 | S12 | 25.5 | KEYV-S12 | 28 |
| VED200L15.0R20-04S12 | ● | 4 | 30° | 20 | 18.3 | 15 | 2 | S12 | 25.5 | KEYV-S12 | 28 |
| VED200L15.0R30-04S12 | ● | 4 | 30° | 20 | 18.3 | 15 | 3 | S12 | 25.5 | KEYV-S12 | 28 |

*Torque: Recommended torque (Nm) for clamping.
Packing quantity = 2 pcs.

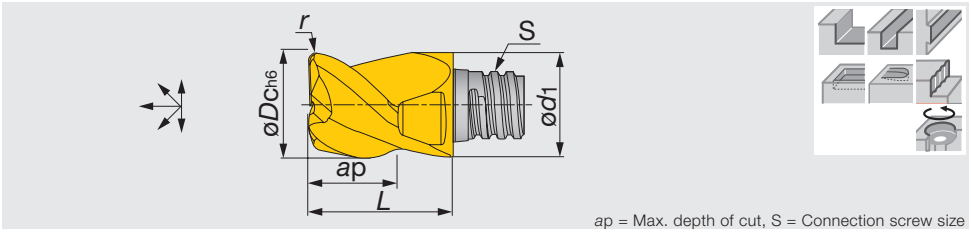
●: Line-up

TUNGMEISTER

## VEE**-03...

TungMeister square head with 3 flutes for key way






ap = Max. depth of cut, S = Connection screw size

| Designation | AH725 | z | Helx | øDc | ød1 | Max. ap | r | S | L | Wrench | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VEE077L04.0R02-03S05 | ● | 3 | 38° | 7.7 | 7.7 | 4 | 0.2 | S05 | 10 | KEYV-S05 | 7 |
| VEE097L05.0R03-03S06 | ● | 3 | 38° | 9.7 | 9.7 | 5 | 0.3 | S06 | 13 | KEYV-S06 | 10 |
| VEE117L07.0R03-03S08 | ● | 3 | 38° | 11.7 | 11.7 | 7 | 0.3 | S08 | 16.5 | KEYV-S08 | 15 |
| VEE157L08.0R03-03S10 | ● | 3 | 38° | 15.7 | 15.3 | 8 | 0.3 | S10 | 20.5 | KEYV-S10 | 28 |
| VEE197L12.0R04-03S12 | ● | 3 | 38° | 19.7 | 18.3 | 12 | 0.4 | S12 | 25.5 | KEYV-S12 | 28 |

*Torque: Recommended torque (Nm) for clamping.
Packing quantity = 2 pcs

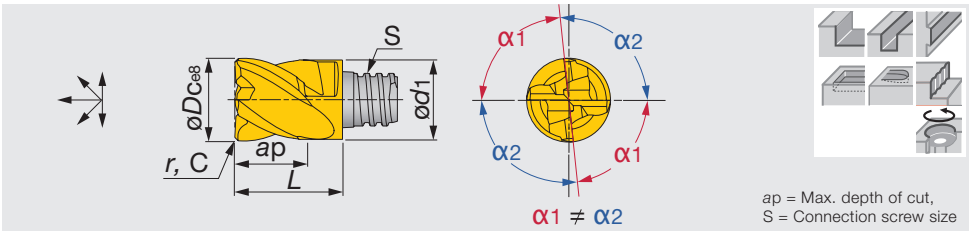
●: Line-up

TUNGMEISTER

## VEE**I...

TungMeister square head with irregular pitch flute for chatter free cutting






ap = Max. depth of cut,
S = Connection screw size

| Designation | AH725 | z | Helx | øDc | ød1 | Max. ap | r | C | S | L | Wrench | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VEE080L05.0C30I04S05 | ● | 4 | 38° | 8 | 7.7 | 5 | - | 0.3 | S05 | 10 | KEYV-S05 | 7 |
| VEE100L07.0C40I04S06 | ● | 4 | 38° | 10 | 9.7 | 7 | - | 0.4 | S06 | 13 | KEYV-S06 | 10 |
| VEE120L09.0C50I04S08 | ● | 4 | 38° | 12 | 11.7 | 9 | - | 0.5 | S08 | 16.5 | KEYV-S08 | 15 |
| VEE160L12.0C60I04S10 | ● | 4 | 38° | 16 | 15.3 | 12 | - | 0.6 | S10 | 20.5 | KEYV-S10 | 28 |
| VEE200L15.0C60I04S12 | ● | 4 | 38° | 20 | 18.3 | 15 | - | 0.6 | S12 | 25.5 | KEYV-S12 | 28 |
| VEE250L22.0C60I04S15 | ● | 4 | 38° | 25 | 23.9 | 22 | - | 0.6 | S15 | 37 | KEYV-W20 | 40 |
| VEE250L22.0R00I04S15 | ● | 4 | 38° | 25 | 23.9 | 22 | - | - | S15 | 37 | KEYV-W20 | 40 |
| VEE250L22.0R05I04S15 | ● | 4 | 38° | 25 | 23.9 | 22 | 0.5 | - | S15 | 37 | KEYV-W20 | 40 |
| VEE250L22.0R10I04S15 | ● | 4 | 38° | 25 | 23.9 | 22 | 1 | - | S15 | 37 | KEYV-W20 | 40 |
| VEE250L22.0R20I04S15 | ● | 4 | 38° | 25 | 23.9 | 22 | 2 | - | S15 | 37 | KEYV-W20 | 40 |
| VEE250L22.0R30I04S15 | ● | 4 | 38° | 25 | 23.9 | 22 | 3 | - | S15 | 37 | KEYV-W20 | 40 |

*Torque: Recommended torque (N.m) for clamping.
VEE080 ~ VEE200: Packing quantity = 2 pcs
VEE250: Packing quantity = 1pc

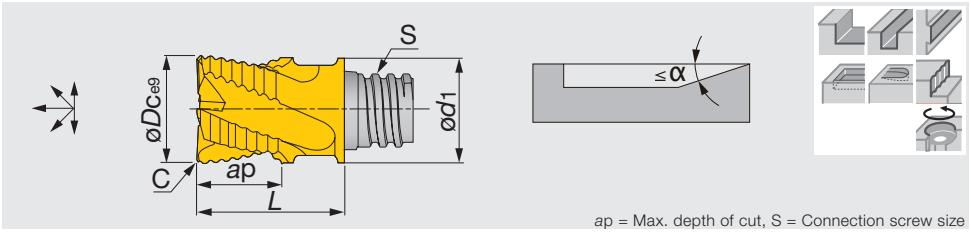
●: Line-up

TUNGMEISTER

## VEE**R...

TungMeister square head with serated edges for roughing






ap = Max. depth of cut, S = Connection screw size

| Designation | AH725 | z | Helx | øDc | ød1 | Max. ap | C | S | L | α° | Wrench | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VEE080L05.0C25R04S05 | ● | 4 | 45° | 8 | 7.7 | 5 | 0.25 | S05 | 10 | 90 | KEYV-S05 | 7 |
| VEE100L07.0C30R04S06 | ● | 4 | 45° | 10 | 9.7 | 7 | 0.3 | S06 | 13 | 90 | KEYV-S06 | 10 |
| VEE120L09.0C35R04S08 | ● | 4 | 45° | 12 | 11.7 | 9 | 0.35 | S08 | 16.5 | 90 | KEYV-S08 | 15 |
| VEE160L12.0C40R05S10 | ● | 5 | 45° | 16 | 15.3 | 12 | 0.4 | S10 | 20.5 | 7 | KEYV-S10 | 28 |
| VEE200L15.0C40R06S12 | ● | 6 | 45° | 20 | 18.3 | 15 | 0.4 | S12 | 25.5 | 3 | KEYV-S12 | 28 |
| VEE250L22.0C50R06S15 | ● | 6 | 45° | 25 | 23.9 | 22 | 0.5 | S15 | 37 | 3 | KEYV-W20 | 40 |

●: Line-up

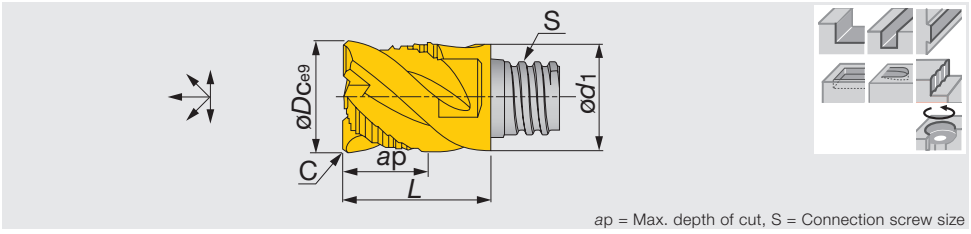
*Torque: Recommended torque (N.m) for clamping.
VEE080 ~ VEE200: Packing quantity = 2 pcs
VEE250: Packing quantity = 1pc

TUNGMEISTER

## VEE**C...

TungMeister square head with combined edges of finish and serated






ap = Max. depth of cut, S = Connection screw size

| Designation | AH725 | z | Helx | øDc | ød1 | Max. ap | C | S | L | Wrench | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VEE080L05.0C30C04S05 | ● | 4 | 45° | 8 | 7.7 | 5 | 0.3 | S05 | 10 | KEYV-S05 | 7 |
| VEE100L07.0C30C04S06 | ● | 4 | 45° | 10 | 9.7 | 7 | 0.3 | S06 | 13 | KEYV-S06 | 10 |
| VEE120L09.0C40C04S08 | ● | 4 | 45° | 12 | 11.7 | 9 | 0.4 | S08 | 16.5 | KEYV-S08 | 15 |
| VEE160L12.0C60C04S10 | ● | 4 | 45° | 16 | 15.3 | 12 | 0.6 | S10 | 20.5 | KEYV-S10 | 28 |
| VEE200L15.0C60C04S12 | ● | 4 | 45° | 20 | 18.3 | 15 | 0.6 | S12 | 25.5 | KEYV-S12 | 28 |
| VEE250L22.0C60C04S15 | ● | 4 | 45° | 25 | 23.9 | 22 | 0.6 | S15 | 37 | KEYV-W20 | 40 |

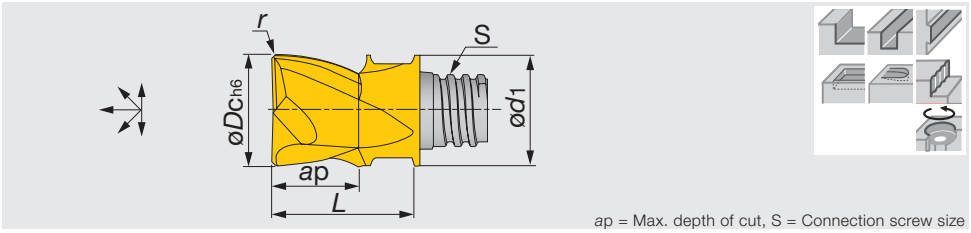
●: Line-up

*Torque: Recommended torque (N.m) for clamping.
VEE080 ~ VEE200: Packing quantity = 2 pcs
VEE250: Packing quantity = 1pc

## VEE**A02...

TungMeister square head with 2 flutes for aluminium machining






ap = Max. depth of cut, S = Connection screw size

| Designation | KS15F | z | Helx | øDc | ød1 | Max. ap | r | S | L | Wrench | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VEE100L07.0R05A02S06 | ● | 2 | 45° | 10 | 9.7 | 7 | 0.5 | S06 | 13 | KEYV-S06 | 10 |
| VEE100L07.0R10A02S06 | ● | 2 | 45° | 10 | 9.7 | 7 | 1 | S06 | 13 | KEYV-S06 | 10 |
| VEE120L09.0R05A02S08 | ● | 2 | 45° | 12 | 11.7 | 9 | 0.5 | S08 | 16.5 | KEYV-S08 | 15 |

*Torque: Recommended torque (Nm) for clamping.
Packing quantity = 2 pcs.

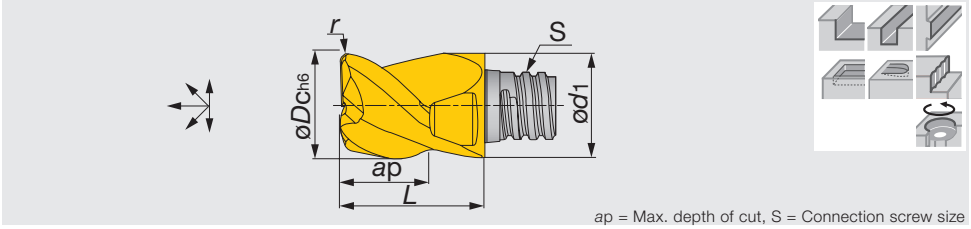
●: Line-up

TUNGMEISTER

## VEE**A03...

TungMeister square head with 3 flutes for aluminium machining






ap = Max. depth of cut, S = Connection screw size

| Designation | KS15F | z | Helx | øDc | ød1 | Max. ap | r | S | L | Wrench | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VEE080L05.0R05A03S05 | ● | 3 | 45° | 8 | 7.7 | 5 | 0.5 | S05 | 10 | KEYV-S05 | 7 |
| VEE100L06.0R05A03S06 | ● | 3 | 45° | 10 | 9.7 | 6 | 0.5 | S06 | 13 | KEYV-S06 | 10 |
| VEE100L06.0R10A03S06 | ● | 3 | 45° | 10 | 9.7 | 6 | 1 | S06 | 13 | KEYV-S06 | 10 |
| VEE120L08.0R05A03S08 | ● | 3 | 45° | 12 | 11.7 | 8 | 0.5 | S08 | 16.5 | KEYV-S08 | 15 |
| VEE120L08.0R10A03S08 | ● | 3 | 45° | 12 | 11.7 | 8 | 1 | S08 | 16.5 | KEYV-S08 | 15 |
| VEE160L10.0R00A03S10 | ● | 3 | 45° | 16 | 15.3 | 10 | - | S10 | 20.5 | KEYV-S10 | 28 |
| VEE160L10.0R10A03S10 | ● | 3 | 45° | 16 | 15.3 | 10 | 1 | S10 | 20.5 | KEYV-S10 | 28 |
| VEE160L10.0R20A03S10 | ● | 3 | 45° | 16 | 15.3 | 10 | 2 | S10 | 20.5 | KEYV-S10 | 28 |
| VEE200L12.0R05A03S12 | ● | 3 | 45° | 20 | 18.3 | 12 | 0.5 | S12 | 25.5 | KEYV-S12 | 28 |
| VEE200L12.0R10A03S12 | ● | 3 | 45° | 20 | 18.3 | 12 | 1 | S12 | 25.5 | KEYV-S12 | 28 |
| VEE200L12.0R20A03S12 | ● | 3 | 45° | 20 | 18.3 | 12 | 2 | S12 | 25.5 | KEYV-S12 | 28 |

*Torque: Recommended torque (Nm) for clamping.
Packing quantity = 2 pcs.

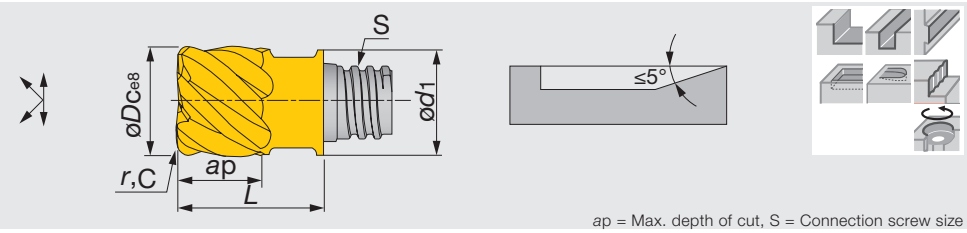
●: Line-up

# TUNGMEISTER

## VED**-06..., VEE**-06...

TungMeister square head with 6 flutes for difficult-to-cut material machining






ap = Max. depth of cut, S = Connection screw size

| Designation | AH725 | AH750 | z | Helx | øDc | ød1 | Max. ap | r | C | S | L | Wrench | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VEE080L05.0R05-06S05 | ● | | 6 | 45° | 8 | 7.7 | 5 | 0.5 | - | S05 | 10 | KEYV-S05 | 7 |
| VEE080L05.0R10-06S05 | ● | | 6 | 45° | 8 | 7.7 | 5 | 1 | - | S05 | 10 | KEYV-S05 | 7 |
| VEE080L05.0R15-06S05 | ● | | 6 | 45° | 8 | 7.7 | 5 | 1.5 | - | S05 | 10 | KEYV-S05 | 7 |
| VEE080L05.0C10-06S05 | | ● | 6 | 50° | 8 | 7.7 | 5 | - | 0.1 | S05 | 10 | KEYV-S05 | 7 |
| VEE100L07.0R00-06S06 | ● | | 6 | 45° | 10 | 9.7 | 7 | - | - | S06 | 13 | KEYV-S06 | 10 |
| VED100L07.0R05-06S06 | ● | | 6 | 30° | 10 | 9.7 | 7 | 0.5 | - | S06 | 13 | KEYV-S06 | 10 |
| VEE100L07.0R05-06S06 | ● | | 6 | 45° | 10 | 9.7 | 7 | 0.5 | - | S06 | 13 | KEYV-S06 | 10 |
| VED100L07.0R10-06S06 | ● | | 6 | 30° | 10 | 9.7 | 7 | 1 | - | S06 | 13 | KEYV-S06 | 10 |
| VEE100L07.0R10-06S06 | ● | | 6 | 45° | 10 | 9.7 | 7 | 1 | - | S06 | 13 | KEYV-S06 | 10 |
| VED100L07.0R15-06S06 | ● | | 6 | 30° | 10 | 9.7 | 7 | 1.5 | - | S06 | 13 | KEYV-S06 | 10 |
| VEE100L07.0R15-06S06 | ● | | 6 | 45° | 10 | 9.7 | 7 | 1.5 | - | S06 | 13 | KEYV-S06 | 10 |
| VEE100L07.0C10-06S06 | | ● | 6 | 50° | 10 | 9.7 | 7 | - | 0.1 | S06 | 13 | KEYV-S06 | 10 |
| VEE120L09.0R00-06S08 | ● | | 6 | 45° | 12 | 11.7 | 9 | - | - | S08 | 16.5 | KEYV-S08 | 15 |
| VED120L09.0R05-06S08 | ● | | 6 | 30° | 12 | 11.7 | 9 | 0.5 | - | S08 | 16.5 | KEYV-S08 | 15 |
| VED120L09.0R10-06S08 | ● | | 6 | 30° | 12 | 11.7 | 9 | 1 | - | S08 | 16.5 | KEYV-S08 | 15 |
| VEE120L09.0R10-06S08 | ● | | 6 | 45° | 12 | 11.7 | 9 | 1 | - | S08 | 16.5 | KEYV-S08 | 15 |
| VEE120L09.0R15-06S08 | ● | | 6 | 45° | 12 | 11.7 | 9 | 1.5 | - | S08 | 16.5 | KEYV-S08 | 15 |
| VEE120L09.0C10-06S08 | | ● | 6 | 50° | 12 | 11.7 | 9 | - | 0.1 | S08 | 16.5 | KEYV-S08 | 15 |

*Torque: Recommended torque (Nm) for clamping.
Packing quantity = 2 pcs.

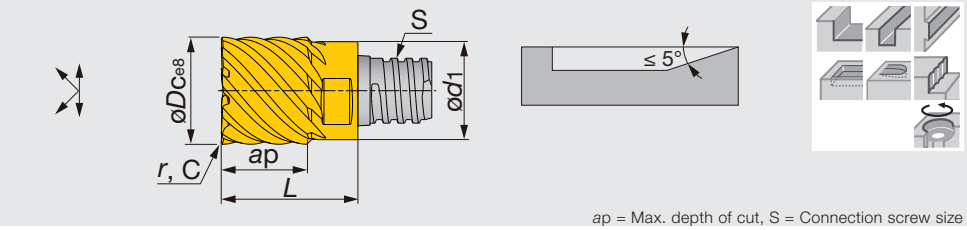
●: Line-up

# TUNGMEISTER

## VED**-08,10..., VEE**-08,10...

TungMeister square head with 8, 10 flutes for difficult-to-cut material machining






ap = Max. depth of cut, S = Connection screw size

| Designation | AH725 | AH750 | z | Helx | øDc | ød1 | Max. ap | r | C | S | L | Wrench | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VED160L12.0R05-08S10 | ● | | 8 | 30° | 16 | 15.3 | 12 | 0.5 | - | S10 | 20.5 | KEYV-S10 | 28 |
| VED160L12.0R10-08S10 | ● | | 8 | 30° | 16 | 15.3 | 12 | 1 | - | S10 | 20.5 | KEYV-S10 | 28 |
| VED160L12.0R16-08S10 | ● | | 8 | 30° | 16 | 15.3 | 12 | 1.6 | - | S10 | 20.5 | KEYV-S10 | 28 |
| VED160L12.0R20-08S10 | ● | | 8 | 30° | 16 | 15.3 | 12 | 2 | - | S10 | 20.5 | KEYV-S10 | 28 |
| VEE160L12.0C20-08S10 | | ● | 8 | 50° | 16 | 15.3 | 12 | - | 0.2 | S10 | 20.5 | KEYV-S10 | 28 |
| VED200L15.0R10-10S12 | ● | | 10 | 30° | 20 | 18.3 | 15 | 1 | - | S12 | 25.5 | KEYV-S12 | 28 |
| VED200L15.0R20-10S12 | ● | | 10 | 30° | 20 | 18.3 | 15 | 2 | - | S12 | 25.5 | KEYV-S12 | 28 |
| VEE200L15.0C20-10S12 | | ● | 10 | 50° | 20 | 18.3 | 15 | - | 0.2 | S12 | 25.5 | KEYV-S12 | 28 |
| VED250L22.0R10-10S15 | ● | | 10 | 30° | 25 | 23.9 | 22 | 1 | - | S15 | 37 | KEYV-W20 | 40 |
| VED250L22.0R20-10S15 | ● | | 10 | 30° | 25 | 23.9 | 22 | 2 | - | S15 | 37 | KEYV-W20 | 40 |

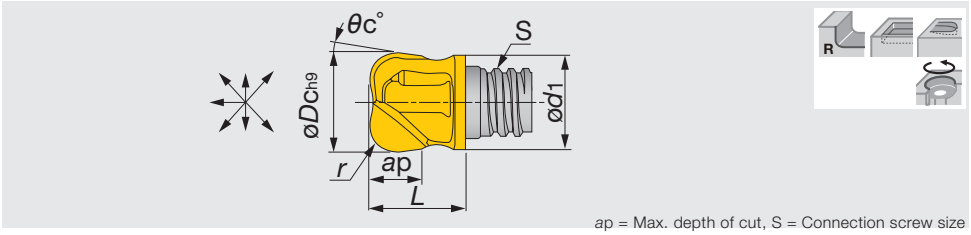
*Torque: Recommended torque (N.m) for clamping.
VEE / VED160 - 200: Packing quantity = 2 pcs.
VED250: Packing quantity = 1pc.

●: Line-up

## VRB**-02...,VRC**-02...

TungMeister radius head with 2 pressed flutes






ap = Max. depth of cut, S = Connection screw size

| Designation | AH725 | z | Helx | øDc | ød1 | Max. ap | r | θc° | S | L | Wrench | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VRC100L07.0R05-02S06 | ● | 2 | 15° | 10 | 9.5 | 7 | 0.5 | 5 | S06 | 12.4 | KEYV-S06 | 10 |
| VRC100L07.0R10-02S06 | ● | 2 | 15° | 10 | 9.5 | 7 | 1 | 5 | S06 | 12.4 | KEYV-S06 | 10 |
| VRB100L06.0R20-02S06 | ● | 2 | 0° | 10 | 9.2 | 6 | 2 | 7 | S06 | 12.4 | KEYV-S06 | 10 |
| VRB120L05.7R30-02S06 | ● | 2 | 0° | 12 | 9.5 | 5.7 | 3 | 7 | S06 | 9.1 | **KEYV-S08 | 10 |
| VRB120L05.4R40-02S06 | ● | 2 | 0° | 12 | 9.5 | 5.4 | 4 | 7 | S06 | 9.1 | **KEYV-S08 | 10 |
| VRB120L06.3R16-02S08 | ● | 2 | 0° | 12 | 11.5 | 5.9 | 1.6 | 7 | S08 | 11.1 | KEYV-S08 | 15 |
| VRB120L06.2R20-02S08 | ● | 2 | 0° | 12 | 11.5 | 6.2 | 2 | 7 | S08 | 11.1 | KEYV-S08 | 15 |
| VRB120L06.1R25-02S08 | ● | 2 | 0° | 12 | 11.5 | 5.8 | 2.5 | 7 | S08 | 11.1 | KEYV-S08 | 15 |
| VRB120L06.1R30-02S08 | ● | 2 | 0° | 12 | 11.5 | 5.7 | 3 | 7 | S08 | 11.1 | KEYV-S08 | 15 |
| VRB120L05.9R40-02S08 | ● | 2 | 0° | 12 | 11.5 | 5.5 | 4 | 7 | S08 | 11.1 | KEYV-S08 | 15 |
| VRB160L08.0R50-02S10 | ● | 2 | 0° | 16 | 15.2 | 8 | 5 | 7 | S10 | 20.2 | KEYV-S10 | 28 |
| VRB200L11.1R30-02S12 | ● | 2 | 0° | 20 | 18.3 | 11 | 3 | 7 | S12 | 17 | KEYV-S12 | 28 |
| VRB200L11.5R40-02S12 | ● | 2 | 0° | 20 | 18.3 | 11.3 | 4 | 7 | S12 | 17.3 | KEYV-S12 | 28 |
| VRB200L11.5R50-02S12 | ● | 2 | 0° | 20 | 18.3 | 11.3 | 5 | 7 | S12 | 17.3 | KEYV-S12 | 28 |
| VRB200L11.4R60-02S12 | ● | 2 | 0° | 20 | 18.3 | 11.2 | 6 | 7 | S12 | 17.3 | KEYV-S12 | 28 |
| VRB200L11.3R80-02S12 | ● | 2 | 0° | 20 | 18.3 | 11.1 | 8 | 7 | S12 | 17.3 | KEYV-S12 | 28 |

●: Line-up

Note: Suitable for contouring operation. Some heads require different size of wrench.
*Torque: Recommended torque (Nm) for clamping.
Packing quantity = 2 pcs.

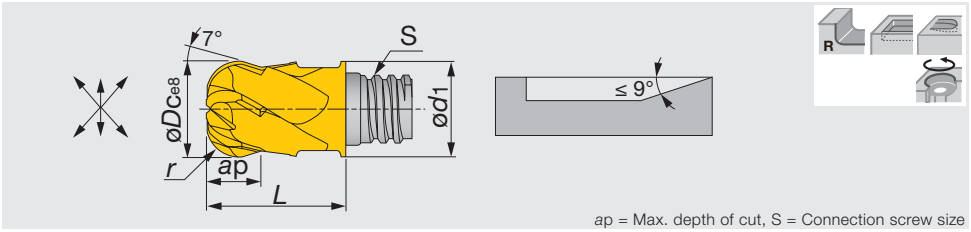


TUNGMEISTER

## VRD**-06...

TungMeister radius head with 6 ground flutes






ap = Max. depth of cut, S = Connection screw size

| Designation | AH725 | z | Helx | øDc | ød1 | Max. ap | r | S | L | Wrench | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VRD080L04.0R20-06S05 | ● | 6 | 30° | 8 | 7.7 | 4 | 2 | S05 | 10 | KEYV-S05 | 7 |
| VRD100L05.0R30-06S06 | ● | 6 | 30° | 10 | 9.7 | 5 | 3 | S06 | 13 | KEYV-S06 | 10 |
| VRD120L07.0R40-06S08 | ● | 6 | 30° | 12 | 11.7 | 7 | 4 | S08 | 16.5 | KEYV-S08 | 15 |
| VRD160L09.0R50-06S10 | ● | 6 | 30° | 16 | 15.3 | 9 | 5 | S10 | 20.5 | KEYV-S10 | 28 |

●: Line-up

*Torque: Recommended torque (Nm) for clamping.
Packing quantity = 2 pcs.

# STANDARD CUTTING CONDITIONS

## Shoulder milling (VEE: 3 flutes, VED/VEE: 4 flutes, VEE-A, VEE-I, VEE-R, VEE-C, VRB, VRC, VRD)

| ISO | Workpiece material | Hard-ness | Cutting speed | Feed per tooth: *fz* (mm/t) | | | | | | | Depth of cut | Pick feed |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Tool diameter: ø*Dc* (mm) | | | | | | | | |
| | | | *Vc* (m/min) | 6 | 8 | 10 | 12 | 16 | 20 | 25 | *ap* (mm) | *Pf* (mm) |
| P | Low carbon steels C45, C55, etc. | - 300 HB | 80 - 180 | 0.03 - 0.07 | 0.05 - 0.09 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.15 | 0.1 - 0.17 | 0.1 - 0.17 | 0.6 x ø*Dc* | 0.25 x ø*Dc* |
| | High carbon steels 42CrMo4, 15Cr3, etc. | - 300 HB | 60 - 140 | 0.03 - 0.07 | 0.05 - 0.09 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.15 | 0.1 - 0.17 | 0.1 - 0.17 | 0.6 x ø*Dc* | 0.25 x ø*Dc* |
| | Prehardened steel PX5, NAK80, etc. | 30 - 40 HRC | 60 - 120 | 0.03 - 0.07 | 0.05 - 0.09 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.15 | 0.1 - 0.17 | 0.1 - 0.17 | 0.6 x ø*Dc* | 0.25 x ø*Dc* |
| M | Stainless steels X5CrNi18-9, X5CrNiMo17-12-2, etc. | - 200 HB | 40 - 100 | 0.03 - 0.07 | 0.05 - 0.09 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.15 | 0.1 - 0.17 | 0.1 - 0.17 | 0.6 x ø*Dc* | 0.25 x ø*Dc* |
| K | Grey cast irons 250, 300, etc. | 150 - 250 HB | 80 - 200 | 0.03 - 0.07 | 0.05 - 0.09 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.15 | 0.1 - 0.17 | 0.1 - 0.17 | 0.6 x ø*Dc* | 0.25 x ø*Dc* |
| | Ductile cast irons 400-15S, etc. | 150 - 250 HB | 80 - 200 | 0.03 - 0.07 | 0.05 - 0.09 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.15 | 0.1 - 0.17 | 0.1 - 0.17 | 0.6 x *Dc* | 0.25 x ø*Dc* |
| N | Aluminium alloys Si < 13% | - | 200 - 700 | 0.03 - 0.07 | 0.05 - 0.09 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.15 | 0.1 - 0.17 | 0.1 - 0.17 | 0.6 x ø*Dc* | 0.25 x ø*Dc* |
| | Aluminium alloys Si ≥13% | - | 100 - 300 | 0.03 - 0.07 | 0.05 - 0.09 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.15 | 0.1 - 0.17 | 0.1 - 0.17 | 0.6 x ø*Dc* | 0.25 x ø*Dc* |
| S | Titanium alloys Ti-6Al-4V, etc. | - | 40 - 80 | 0.03 - 0.07 | 0.05 - 0.09 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.15 | 0.1 - 0.17 | 0.1 - 0.17 | 0.6 x ø*Dc* | 0.05 x ø*Dc* |
| | Heat-resistant alloys Inconel 718, etc. | - | 20 - 40 | 0.03 - 0.07 | 0.05 - 0.09 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.15 | 0.10 - 0.17 | 0.1 - 0.17 | 0.6 x ø*Dc* | 0.05 x ø*Dc* |
| H | Hardened steel X40CrMoV5 1, 55NiCrMoV6, etc. | 40 - 50 HRC | 40 - 80 | 0.03 - 0.07 | 0.05 - 0.09 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.15 | 0.1 - 0.17 | 0.1 - 0.17 | 0.6 x ø*Dc* | 0.05 x ø*Dc* |
| | Hardened steel X153CrMoV12, HS18-0-1, etc. | 50 - 60 HRC | 20 - 60 | 0.03 - 0.07 | 0.05 - 0.09 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.15 | 0.1 - 0.17 | 0.1 - 0.17 | 0.6 x ø*Dc* | 0.05 x ø*Dc* |

## Slot milling (VEE: 3 flutes, VED/VEE: 4 flutes, VEE-A, VEE-I, VEE-R, VEE-C, VRB, VRC, VRD)

| ISO | Workpiece material | Hardness | Cutting speed | Feed per tooth: *fz* (mm/t) | | | | | | | Depth of cut |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Tool diameter: ø*Dc* (mm) | | | | | | | |
| | | | *Vc* (m/min) | 6 | 8 | 10 | 12 | 16 | 20 | 25 | *ap* (mm) |
| P | Low carbon steels C45, C55, etc. | - 300 HB | 80 - 180 | 0.03 - 0.07 | 0.05 - 0.09 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.15 | 0.1 - 0.17 | 0.07 - 0.1 | 0.5 x ø*Dc* |
| | High carbon steels 42CrMo4, 15Cr3, etc. | - 300 HB | 60 - 140 | 0.03 - 0.07 | 0.05 - 0.09 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.15 | 0.1 - 0.17 | 0.07 - 0.1 | 0.5 x ø*Dc* |
| | Prehardened steel PX5, NAK80, etc. | 30 - 40 HRC | 60 - 120 | 0.03 - 0.07 | 0.05 - 0.09 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.15 | 0.1 - 0.17 | 0.07 - 0.1 | 0.5 x ø*Dc* |
| M | Stainless steels X5CrNi18-9, X5CrNiMo17-12-2, etc. | - 200 HB | 40 - 100 | 0.03 - 0.07 | 0.05 - 0.09 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.15 | 0.1 - 0.17 | 0.07 - 0.1 | 0.5 x ø*Dc* |
| K | Grey cast irons 250, 300, etc. | 150 - 250 HB | 80 - 200 | 0.03 - 0.07 | 0.05 - 0.09 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.15 | 0.1 - 0.17 | 0.07 - 0.1 | 0.5 x ø*Dc* |
| | Ductile cast irons 400-15S, etc. | 150 - 250 HB | 80 - 200 | 0.03 - 0.07 | 0.05 - 0.09 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.15 | 0.1 - 0.17 | 0.07 - 0.10 | 0.5 x ø*Dc* |
| N | Aluminium alloys Si < 13% | - | 200 - 700 | 0.03 - 0.07 | 0.05 - 0.09 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.15 | 0.1 - 0.17 | 0.07 - 0.1 | 0.5 x ø*Dc* |
| | Aluminium alloys Si ≥13% | - | 100 - 300 | 0.03 - 0.07 | 0.05 - 0.09 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.15 | 0.1 - 0.17 | 0.07 - 0.1 | 0.5 x ø*Dc* |
| S | Titanium alloys Ti-6Al-4V, etc. | - | 40 - 80 | 0.03 - 0.07 | 0.05 - 0.09 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.15 | 0.1 - 0.17 | 0.07 - 0.1 | 0.5 x ø*Dc* |
| | Heat-resistant alloys Inconel 718, etc. | - | 20 - 40 | 0.03 - 0.07 | 0.05 - 0.09 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.15 | 0.1 - 0.17 | 0.07 - 0.1 | 0.5 x ø*Dc* |
| H | Hardened steel X40CrMoV5 1, 55NiCrMoV6, etc. | 40 - 50 HRC | 40 - 80 | 0.03 - 0.07 | 0.05 - 0.09 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.15 | 0.1 - 0.17 | 0.07 - 0.1 | 0.2 x ø*Dc* |
| | Hardened steel X153CrMoV12, HS18-0-1, etc. | 50 - 60 HRC | 20 - 60 | 0.03 - 0.07 | 0.05 - 0.09 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.15 | 0.1 - 0.17 | 0.07 - 0.1 | 0.2 x ø*Dc* |

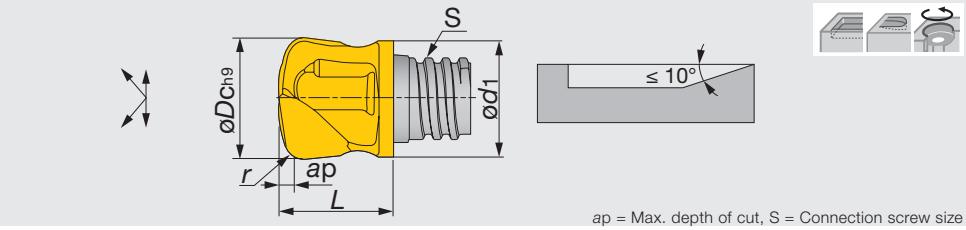
## STANDARD CUTTING CONDITIONS

### Shoulder milling (VED / VEE: 6 flutes, VED / VEE: 8, 10 flutes)

| ISO | Workpiece material | Hard-ness | Cutting speed *Vc* (m/min) | Feed per tooth: *fz* (mm/t) Tool diameter: ø*Dc* (mm) 8 | 10 | 12 | 16 | 20 | 25 | Depth of cut *ap* (mm) | Pick feed *Pf* (mm) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| S | Titanium alloys Ti-6Al-4V, etc. | - | 60 - 120 | 0.05 - 0.09 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.15 | 0.1 - 0.17 | 0.1 - 0.17 | 0.6 x ø*Dc* | 0.02 x ø*Dc* |
| | Heat-resistant alloys Inconel 718, etc. | - | 30 - 60 | 0.05 - 0.09 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.15 | 0.1 - 0.17 | 0.1 - 0.17 | 0.6 x ø*Dc* | 0.02 x ø*Dc* |
| H | Hardened steel X40CrMoV5 1, 55NiCrMoV6, etc. | 40 - 50 HRC | 80 - 160 | 0.05 - 0.09 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.15 | 0.1 - 0.17 | 0.1 - 0.17 | 0.6 x ø*Dc* | 0.02 x ø*Dc* |
| | Hardened steel X153CrMoV12, HS18-0-1, etc. | 50 - 60 HRC | 40 - 90 | 0.05 - 0.09 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.15 | 0.1 - 0.17 | 0.1 - 0.17 | 0.6 x ø*Dc* | 0.02 x ø*Dc* |

TungMeister radius head for super high-feed milling






*ap* = Max. depth of cut, S = Connection screw size

| Designation | AH725 | z | Helx | ø*Dc* | ø*d*1 | Max. *ap* | r(1) | S | *L* | Wrench | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VFX100L00.6R20-02S06 | ● | 2 | 0° | 10 | 9.6 | 0.6 | 2 | S06 | 12.5 | KEYV-S06 | 10 |
| VFX120L01.0R25-02S08 | ● | 2 | 0° | 12 | 11.5 | 1.0 | 2.5 | S08 | 11.1 | KEYV-S08 | 15 |
| VFX160L01.1R30-02S10 | ● | 2 | 0° | 16 | 15.2 | 1.1 | 3 | S10 | 20 | KEYV-S10 | 28 |
| VFX200L01.5R33-02S12 | ● | 2 | 0° | 20 | 18.3 | 1.5 | 3.3 | S12 | 17.5 | KEYV-S12 | 28 |

●: Line-up

(1) Corner radius for CAM programing
Note: For VFX head, taper neck shank or Tungsten shank should be recommended.
*Torque: Recommended torque (Nm) for clamping.
Packing quantity = 2 pcs.

## STANDARD CUTTING CONDITIONS

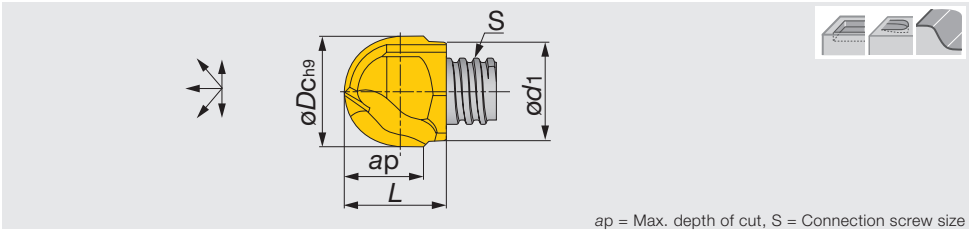
### High feed milling (VFX)

| ISO | Workpiece material | Hardness | Cutting speed *Vc* (m/min) | ø10a | | ø12 | | ø16 | | ø20 | | Width of cut *ae* (mm) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Feed per tooth *fz* (mm/t) | Depth of cut *ap* (mm) | Feed per tooth *fz* (mm/t) | Depth of cut *ap* (mm) | Feed per tooth *fz* (mm/t) | Depth of cut *ap* (mm) | Feed per tooth *fz* (mm/t) | Depth of cut *ap* (mm) | |
| P | Low carbon steels C45, C55, etc. | - 300 HB | 100 - 200 | 0.3 - 0.7 | 0.5 | 0.4 - 0.8 | 0.5 | 0.5 - 0.9 | 0.75 | 0.6 - 1 | 1 | 0.6 x ø*Dc* |
| | High carbon steels 42CrMo4, 15Cr3, etc. | - 300 HB | 80 - 180 | 0.2 - 0.6 | 0.5 | 0.3 - 0.7 | 0.5 | 0.4 - 0.8 | 0.75 | 0.5 - 0.9 | 1 | 0.6 x ø*Dc* |
| | Prehardened steel PX5, NAK80, etc. | 30 - 40 HRC | 80 - 160 | 0.2 - 0.5 | 0.4 | 0.2 - 0.5 | 0.4 | 0.3 - 0.6 | 0.5 | 0.3 - 0.6 | 0.75 | 0.6 x ø*Dc* |
| M | Stainless steels X5CrNi18-9, X5CrNiMo17-12-2, etc. | - 200 HB | 60 - 100 | 0.2 - 0.6 | 0.4 | 0.2 - 0.6 | 0.4 | 0.3 - 0.7 | 0.5 | 0.3 - 0.7 | 0.75 | 0.6 x ø*Dc* |
| K | Grey cast irons 250, 300, etc. | 150 - 250 HB | 100 - 220 | 0.3 - 0.7 | 0.5 | 0.4 - 0.8 | 0.75 | 0.5 - 0.9 | 0.75 | 0.6 - 1 | 1 | 0.6 x ø*Dc* |
| | Ductile cast irons 400-15S, etc. | 150 - 250 HB | 100 - 220 | 0.2 - 0.6 | 0.5 | 0.3 - 0.7 | 0.75 | 0.4 - 0.8 | 0.75 | 0.5 - 0.9 | 1 | 0.6 x ø*Dc* |
| S | Titanium alloys Ti-6Al-4V, etc. | - | 40 - 80 | 0.2 - 0.5 | 0.4 | 0.2 - 0.5 | 0.4 | 0.2 - 0.6 | 0.5 | 0.2 - 0.6 | 0.5 | 0.25 x ø*Dc* |
| | Heat-resistant alloys Inconel 718, etc. | - | 20 - 40 | 0.1 - 0.3 | 0.3 | 0.1 - 0.3 | 0.3 | 0.1 - 0.3 | 0.4 | 0.1 - 0.3 | 0.4 | 0.25 x ø*Dc* |
| H | Hardened steel X40CrMoV5 1, 55NiCrMoV6, etc. | 40 - 50 HRC | 40 - 80 | 0.2 - 0.4 | 0.3 | 0.2 - 0.4 | 0.3 | 0.3 - 0.5 | 0.4 | 0.3 - 0.5 | 0.4 | 0.45 x ø*Dc* |
| | Hardened steel X153CrMoV12, HS18-0-1, etc. | 50 - 60 HRC | 20 - 60 | 0.1 - 0.2 | 0.2 | 0.1 - 0.2 | 0.2 | 0.1 - 0.3 | 0.3 | 0.1 - 0.3 | 0.3 | 0.25 x ø*Dc* |

# TUNGMEISTER
## VBB**-BM...

TungMeister ball nose head with pressed edge for roughing






ap = Max. depth of cut, S = Connection screw size

| Designation | AH725 | z | Helx | øDc | ød1 | Max. ap | S | L | Wrench | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| VBB080L08.0-BM-02S05 | ● | 2 | 0° | 8 | 7.6 | 8 | S05 | 10 | KEYV-S05 | 7 |
| VBB100L10.0-BM-02S06 | ● | 2 | 0° | 10 | 9.5 | 10 | S06 | 12.4 | KEYV-S06 | 10 |
| VBB120L12.0-BM-02S08 | ● | 2 | 0° | 12 | 11.5 | 11.5 | S08 | 15.3 | KEYV-S08 | 15 |
| VBB160L16.0-BM-02S10 | ● | 2 | 0° | 16 | 15.2 | 16 | S10 | 19.1 | KEYV-S10 | 28 |

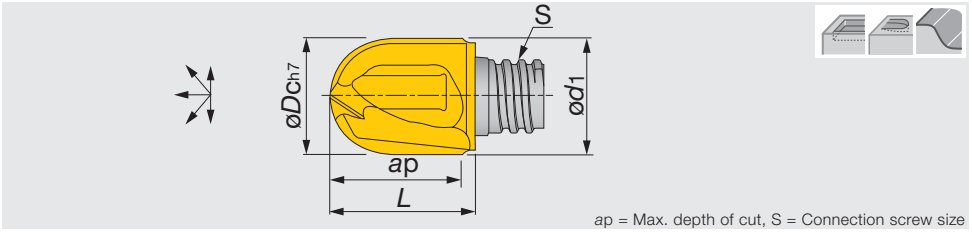
●: Line-up

• For roughing
*Torque: Recommended torque (Nm) for clamping.
Packing quantity = 2 pcs.

# TUNGMEISTER
## VBB**-BG...

TungMeister ball nose head with ground edge for semi-finishing






ap = Max. depth of cut, S = Connection screw size

| Designation | AH750 | z | Helx | øDc | ød1 | Max. ap | S | L | Wrench | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| VBB080L08.0-BG-02S05 | ● | 2 | 0° | 8 | 7.6 | 8 | S05 | 10 | KEYV-S05 | 7 |
| VBB100L10.0-BG-02S06 | ● | 2 | 0° | 10 | 9.6 | 10 | S06 | 12.4 | KEYV-S06 | 10 |
| VBB120L12.0-BG-02S08 | ● | 2 | 0° | 12 | 11.5 | 12 | S08 | 15.3 | KEYV-S08 | 15 |
| VBB160L16.0-BG-02S10 | ● | 2 | 0° | 16 | 15.2 | 16 | S10 | 19.1 | KEYV-S10 | 28 |

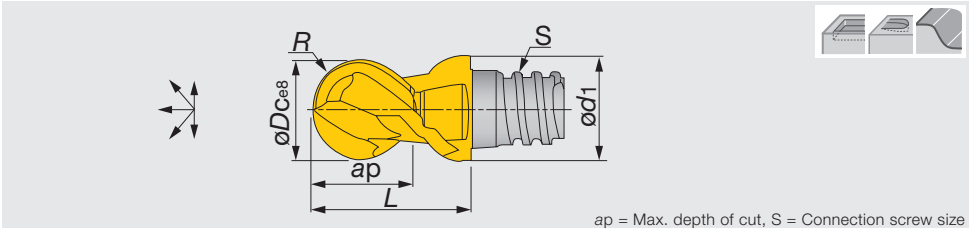
●: Line-up

*Torque: Recommended torque (Nm) for clamping.
Packing quantity = 2 pcs.

# TUNGMEISTER
## VBD**-BG...

TungMeister ball nose head with 2 flutes and helical ground edge for finishing






ap = Max. depth of cut, S = Connection screw size

| Designation | AH725 | z | Helx | øDc | ød1 | Max. ap | R | S | L | Wrench | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VBD080L05.0-BG-02S05 | ● | 2 | 30° | 8 | 7.7 | 5 | 3.982(1) | S05 | 10 | KEYV-S05 | 7 |
| VBD100L07.0-BG-02S06 | ● | 2 | 30° | 10 | 9.7 | 7 | 4.982(1) | S06 | 13.0 | KEYV-S06 | 10 |
| VBD120L09.0-BG-02S08 | ● | 2 | 30° | 12 | 11.7 | 9 | 5.978(2) | S08 | 16.5 | KEYV-S08 | 15 |
| VBD160L09.5-BG-02S10 | ● | 2 | 30° | 16 | 15.3 | 9 | 7.978(2) | S10 | 20.5 | KEYV-S10 | 28 |

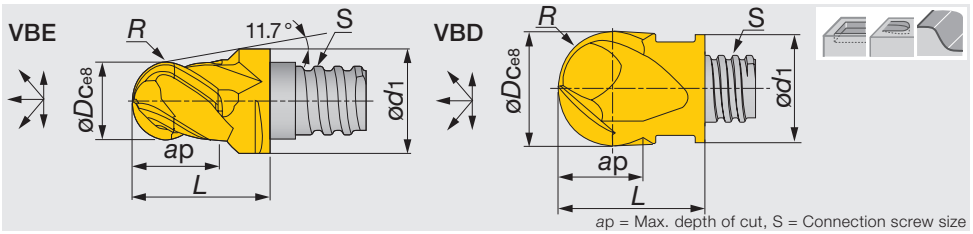
●: Line-up

• The tolerance of R : (1) ± 0.01 (2) ± 0.012
*Torque: Recommended torque (Nm) for clamping.
Packing quantity = 2 pcs.

## TUNGMEISTER
### VBD**-BG..., VBE**-BG...

TungMeister ball nose head with 4 flutes and helical ground edge for finishing






| Designation | AH725 | z | Helx | øDc | ød1 | Max. ap | R | S | L | Wrench | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VBE060L05.5-BG-04S05 | ● | 4 | 38° | 6 | 8 | 5.5 | 2.987(1) | S05 | 10 | KEYV-S05 | 7 |
| VBD080L05.0-BG-04S05 | ● | 4 | 30° | 8 | 7.7 | 5 | 3.982(1) | S05 | 10 | KEYV-S05 | 7 |
| VBD100L07.0-BG-04S06 | ● | 4 | 30° | 10 | 9.7 | 7 | 4.982(1) | S06 | 13 | KEYV-S06 | 10 |
| VBD120L09.0-BG-04S08 | ● | 4 | 30° | 12 | 11.7 | 9 | 5.978(2) | S08 | 16.5 | KEYV-S08 | 15 |
| VBD160L12.0-BG-04S10 | ● | 4 | 30° | 16 | 15.3 | 12 | 7.978(2) | S10 | 20.5 | KEYV-S10 | 28 |
| VBD200L15.0-BG-04S12 | ● | 4 | 30° | 20 | 18.3 | 15 | 9.972(2) | S12 | 25.5 | KEYV-S12 | 28 |
| VBD250L22.0-BG-04S15 | ● | 4 | 30° | 25 | 23.9 | 22 | 12.470(3) | S15 | 37 | KEYV-W20 | 40 |

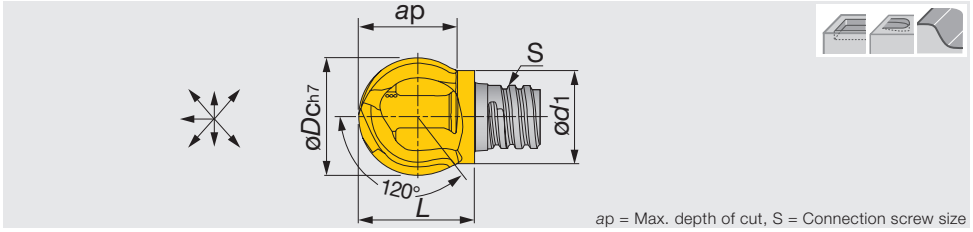
• The tolerance of R : (1) ± 0.01 (2) ± 0.012 (3) ± 0.02
*Torque: Recommended torque (N.m) for clamping.
VBE060/VBD080 ~ VBD200: Packing quantity = 2 pcs.
VBD250: Packing quantity = 1pc.

●: Line-up

## TUNGMEISTER
### VBB**-SG...

TungMeister ball nose head with spherical designed edge,available for pull-cutting on the wall






| Designation | AH725 | z | Helx | øDc | ød1 | Max. ap | S | L | Wrench | Torque** |
|---|---|---|---|---|---|---|---|---|---|---|
| VBB100L08.0-SG-02S05 | ● | 2 | 0° | 10 | 7.6 | 7.5 | S05 | 10 | KEYV-S05 | 7 |
| VBB120L09.6-SG-02S06 | ● | 2 | 0° | 12 | 9.5 | 9 | S06 | 11.6 | *KEYV-S08 | 10 |
| VBB160L12.9-SG-02S08 | ● | 2 | 0° | 16 | 12.2 | 12 | S08 | 15.4 | *KEYV-S10 | 15 |
| VBB200L16.1-SG-02S10 | ● | 2 | 0° | 20 | 15.2 | 15 | S10 | 18.4 | KEYV-S10 | 28 |

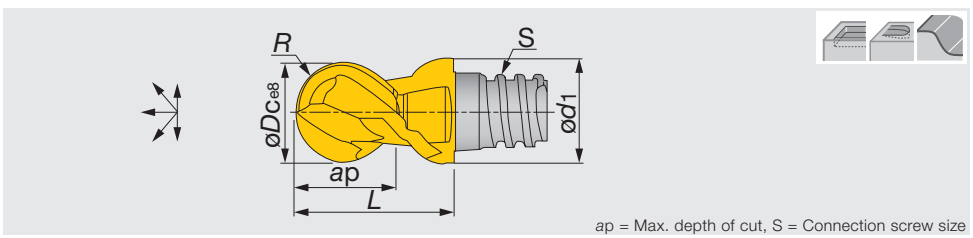
• For pull-cutting on the vertical wall
* Some heads require different size of wrench.
**Torque: Recommended torque (Nm) for clamping.
Packing quantity = 2 pcs.

●: Line-up

## TUNGMEISTER
### VBE**-BGA...

TungMeister ball nose head with 2 flutes and helical ground edge for Al machining






| Designation | KS15F | z | Helx | øDc | ød1 | Max. ap | R | S | L | Wrench | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VBE080L05.0-BGA02S05 | ● | 2 | 45° | 8 | 7.7 | 5 | 3.982(1) | S05 | 10 | KEYV-S05 | 7 |
| VBE100L07.0-BGA02S06 | ● | 2 | 45° | 10 | 9.7 | 7 | 4.982(1) | S06 | 13 | KEYV-S06 | 10 |
| VBE120L09.0-BGA02S08 | ● | 2 | 45° | 12 | 11.7 | 9 | 5.987(2) | S08 | 16.5 | KEYV-S08 | 15 |
| VBE160L12.0-BGA02S10 | ● | 2 | 45° | 16 | 15.3 | 12 | 7.978(2) | S10 | 20.5 | KEYV-S10 | 28 |
| VBE200L15.0-BGA02S12 | ● | 2 | 45° | 20 | 18.3 | 15 | 9.972(2) | S12 | 25.5 | KEYV-S12 | 28 |

• The tolerance of R : (1) ± 0.01 (2) ± 0.012
*Torque: Recommended torque (Nm) for clamping.
Packing quantity = 2 pcs.

●: Line-up

## Standard cutting conditions: Profiling for roughing (VBB-BM / BG / SG, VBD-BG, VBE-BGA)

| ISO | Workpiece material | Hard-ness | Cutting speed *Vc* (m/min) | Feed per tooth: *fz* (mm/t) — Tool diameter: *øDc* (mm) 6 | 8 | 10 | 12 | 16 | 20 | 25 | Depth of cut *ap* (mm) | Pick feed *Pf* (mm) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Low carbon steels C45, C55, etc. | - 300 HB | 100 - 200 | 0.03 - 0.07 | 0.04 - 0.08 | 0.05 - 0.10 | 0.06 - 0.11 | 0.07 - 0.13 | 0.08 - 0.15 | 0.08 - 0.15 | 0.3 x *øDc* | 0.4 x *øDc* |
| P | High carbon steels 42CrMo4, 15Cr3, etc. | - 300 HB | 80 - 180 | 0.03 - 0.07 | 0.04 - 0.08 | 0.05 - 0.10 | 0.06 - 0.11 | 0.07 - 0.13 | 0.08 - 0.15 | 0.08 - 0.15 | 0.3 x *øDc* | 0.4 x *øDc* |
| P | Prehardened steel PX5, NAK80, etc. | 30 - 40 HRC | 80 - 160 | 0.03 - 0.07 | 0.04 - 0.08 | 0.05 - 0.10 | 0.06 - 0.11 | 0.07 - 0.13 | 0.08 - 0.15 | 0.08 - 0.15 | 0.3 x *øDc* | 0.4 x *øDc* |
| M | Stainless steels X5CrNi18-9, X5CrNiMo17-12-2, etc. | - 200 HB | 60 - 100 | 0.03 - 0.07 | 0.04 - 0.08 | 0.05 - 0.10 | 0.06 - 0.11 | 0.07 - 0.13 | 0.08 - 0.15 | 0.08 - 0.15 | 0.3 x *øDc* | 0.4 x *øDc* |
| K | Grey cast irons 250, 300, etc. | 150 - 250 HB | 100 - 220 | 0.03 - 0.07 | 0.04 - 0.08 | 0.05 - 0.10 | 0.06 - 0.11 | 0.07 - 0.13 | 0.08 - 0.15 | 0.08 - 0.15 | 0.3 x *øDc* | 0.4 x *øDc* |
| K | Ductile cast irons 400-15S, etc. | 150 - 250 HB | 100 - 220 | 0.03 - 0.07 | 0.04 - 0.08 | 0.05 - 0.10 | 0.06 - 0.11 | 0.07 - 0.13 | 0.08 - 0.15 | 0.08 - 0.15 | 0.3 x *øDc* | 0.4 x *øDc* |
| N | Aluminium alloys Si < 13% | - | 200 - 700 | 0.03 - 0.07 | 0.04 - 0.08 | 0.05 - 0.10 | 0.06 - 0.11 | 0.07 - 0.13 | 0.08 - 0.15 | 0.08 - 0.15 | 0.3 x *øDc* | 0.4 x *øDc* |
| N | Aluminium alloys Si ≥13% | - | 100 - 300 | 0.03 - 0.07 | 0.04 - 0.08 | 0.05 - 0.10 | 0.06 - 0.11 | 0.07 - 0.13 | 0.08 - 0.15 | 0.08 - 0.15 | 0.3 x *øDc* | 0.4 x *øDc* |
| S | Titanium alloys Ti-6Al-4V, etc. | - | 40 - 80 | 0.03 - 0.07 | 0.04 - 0.08 | 0.05 - 0.10 | 0.06 - 0.11 | 0.07 - 0.13 | 0.08 - 0.15 | 0.08 - 0.15 | 0.3 x *øDc* | 0.2 x *øDc* |
| S | Heat-resistant alloys Inconel 718, etc. | 50 - 60 HRC | 20 - 40 | 0.03 - 0.07 | 0.04 - 0.08 | 0.05 - 0.10 | 0.06 - 0.11 | 0.07 - 0.13 | 0.08 - 0.15 | 0.08 - 0.15 | 0.3 x *øDc* | 0.2 x *øDc* |
| H | Hardened steel X40CrMoV5 1, 55NiCrMoV6, etc. | - | 40 - 80 | 0.03 - 0.07 | 0.04 - 0.08 | 0.05 - 0.10 | 0.06 - 0.11 | 0.07 - 0.13 | 0.08 - 0.15 | 0.08 - 0.15 | 0.3 x *øDc* | 0.2 x *øDc* |
| H | Hardened steel X153CrMoV12, HS18-0-1, etc. | 50 - 60 HRC | 20 - 60 | 0.03 - 0.07 | 0.04 - 0.08 | 0.05 - 0.10 | 0.06 - 0.11 | 0.07 - 0.13 | 0.08 - 0.15 | 0.08 - 0.15 | 0.3 x *øDc* | 0.2 x *øDc* |



## Standard cutting conditions: Profiling for semi-finishing and finishing (VBB-BM / BG / SG, VBD-BG, VBE-BGA)

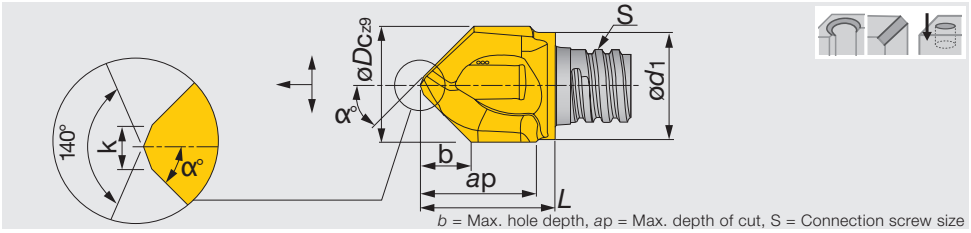
| ISO | Workpiece material | Hard-ness | Cutting speed *Vc* (m/min) | Feed per tooth: *fz* (mm/t) — Tool diameter: *øDc* (mm) 6 | 8 | 10 | 12 | 16 | 20 | 25 | Depth of cut *ap* (mm) | Pick feed *Pf* (mm) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Low carbon steels C45, C55, etc. | - 300 HB | 120 - 250 | 0.04 - 0.09 | 0.06 - 0.11 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.16 | 0.1 - 0.18 | 0.1 - 0.18 | 0.1 x *øDc* | 0.15 x *øDc* |
| P | High carbon steels 42CrMo4, 15Cr3, etc. | - 300 HB | 100 - 220 | 0.04 - 0.09 | 0.06 - 0.11 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.16 | 0.1 - 0.18 | 0.1 - 0.18 | 0.1 x *øDc* | 0.15 x *øDc* |
| P | Prehardened steel PX5, NAK80, etc. | 30 - 40 HRC | 100 - 200 | 0.04 - 0.09 | 0.06 - 0.11 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.16 | 0.1 - 0.18 | 0.1 - 0.18 | 0.1 x *øDc* | 0.15 x *øDc* |
| M | Stainless steels X5CrNi18-9, X5CrNiMo17-12-2, etc. | - 200 HB | 80 - 120 | 0.04 - 0.09 | 0.06 - 0.11 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.16 | 0.1 - 0.18 | 0.1 - 0.18 | 0.1 x *øDc* | 0.15 x *øDc* |
| K | Grey cast irons 250, 300, etc. | 150 - 250 HB | 120 - 280 | 0.04 - 0.09 | 0.06 - 0.11 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.16 | 0.1 - 0.18 | 0.1 - 0.18 | 0.1 x *øDc* | 0.15 x *øDc* |
| K | Ductile cast irons 400-15S, etc. | 150 - 250 HB | 120 - 280 | 0.04 - 0.09 | 0.06 - 0.11 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.16 | 0.1 - 0.18 | 0.1 - 0.18 | 0.1 x *øDc* | 0.15 x *øDc* |
| N | Aluminium alloys Si < 13% | - | 300 - 1000 | 0.04 - 0.09 | 0.06 - 0.11 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.16 | 0.1 - 0.18 | 0.1 - 0.18 | 0.1 x *øDc* | 0.15 x *øDc* |
| N | Aluminium alloys Si ≥13% | - | 150 - 400 | 0.04 - 0.09 | 0.06 - 0.11 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.16 | 0.1 - 0.18 | 0.1 - 0.18 | 0.1 x *øDc* | 0.15 x *øDc* |
| S | Titanium alloys Ti-6Al-4V, etc. | - | 50 - 100 | 0.04 - 0.09 | 0.06 - 0.11 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.16 | 0.1 - 0.18 | 0.1 - 0.18 | 0.08 x *øDc* | 0.1 x *øDc* |
| S | Heat-resistant alloys Inconel 718, etc. | 50 - 60 HRC | 30 - 50 | 0.04 - 0.09 | 0.06 - 0.11 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.16 | 0.1 - 0.18 | 0.1 - 0.18 | 0.08 x *øDc* | 0.1 x *øDc* |
| H | Hardened steel X40CrMoV5 1, 55NiCrMoV6, etc. | - | 50 - 100 | 0.04 - 0.09 | 0.06 - 0.11 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.16 | 0.1 - 0.18 | 0.1 - 0.18 | 0.08 x *øDc* | 0.1 x *øDc* |
| H | Hardened steel X153CrMoV12, HS18-0-1, etc. | 50 - 60 HRC | 30 - 80 | 0.04 - 0.09 | 0.06 - 0.11 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.16 | 0.1 - 0.18 | 0.1 - 0.18 | 0.08 x *øDc* | 0.1 x *øDc* |

# TUNGMEISTER

## VCP**-02...

TungMeister head with 2 pressed flutes for spot drilling and chamfering






*b* = Max. hole depth, *ap* = Max. depth of cut, S = Connection screw size

| Designation | AH725 | P angl | z | Helx | ø*Dc* | ø*d*1 | Max. *ap* | *b* | S | *L* | k | α° | Wrench | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VCP100L09.5A30-02S06 | ● | 60 | 2 | 0° | 10 | 9.5 | 8.5 | 7.5 | S06 | 11.75 | 1.5 | 30 | KEYV-S06 | 10 |
| VCP120L12.0A30-02S08 | ● | 60 | 2 | 0° | 12 | 11.5 | 11 | 9.2 | S08 | 15.4 | 1.5 | 30 | KEYV-S08 | 15 |
| VCP160L15.0A30-02S10 | ● | 60 | 2 | 0° | 16 | 15.2 | 16 | 12 | S10 | 20.2 | 2.5 | 30 | KEYV-S10 | 28 |
| VCP080L07.7A45-02S05 | ● | 90 | 2 | 0° | 8 | 7.6 | 7.5 | 3.7 | S05 | 9.75 | 1 | 45 | KEYV-S05 | 7 |
| VCP083L07.9A45-02S05 | ● | 90 | 2 | 0° | 8.3 | 7.6 | 7.5 | 3.8 | S05 | 10 | 1 | 45 | KEYV-S05 | 7 |
| VCP100L09.0A45-02S06 | ● | 90 | 2 | 0° | 10 | 9.5 | 9.5 | 4.4 | S06 | 11.75 | 1.5 | 45 | KEYV-S06 | 10 |
| VCP104L09.0A45-02S06 | ● | 90 | 2 | 0° | 10.4 | 9.5 | 9.5 | 4.6 | S06 | 11.75 | 1.5 | 45 | KEYV-S06 | 10 |
| VCP120L12.0A45-02S08 | ● | 90 | 2 | 0° | 12 | 11.5 | 11.5 | 5.4 | S08 | 15.4 | 1.5 | 45 | KEYV-S08 | 15 |
| VCP124L12.0A45-02S08 | ● | 90 | 2 | 0° | 12.4 | 11.5 | 11.5 | 5.6 | S08 | 15.4 | 1.5 | 45 | KEYV-S08 | 15 |
| VCP160L15.0A45-02S10 | ● | 90 | 2 | 0° | 16 | 15.2 | 15 | 7.1 | S10 | 18.8 | 1.5 | 45 | KEYV-S10 | 28 |
| VCP165L15.0A45-02S10 | ● | 90 | 2 | 0° | 16.5 | 15.2 | 15 | 7.1 | S10 | 18.8 | 1.5 | 45 | KEYV-S10 | 28 |
| VCP100L09.5A60-02S06 | ● | 120 | 2 | 0° | 10 | 9.5 | 9.5 | 2.7 | S06 | 12.7 | 1.5 | 60 | KEYV-S06 | 10 |
| VCP120L12.0A60-02S08 | ● | 120 | 2 | 0° | 12 | 11.5 | 11.5 | 3.3 | S08 | 15.2 | 1.5 | 60 | KEYV-S08 | 15 |
| VCP160L15.5A60-02S10 | ● | 120 | 2 | 0° | 16 | 15.2 | 16 | 4.4 | S10 | 19.9 | 1.5 | 60 | KEYV-S10 | 28 |

●: Line-up

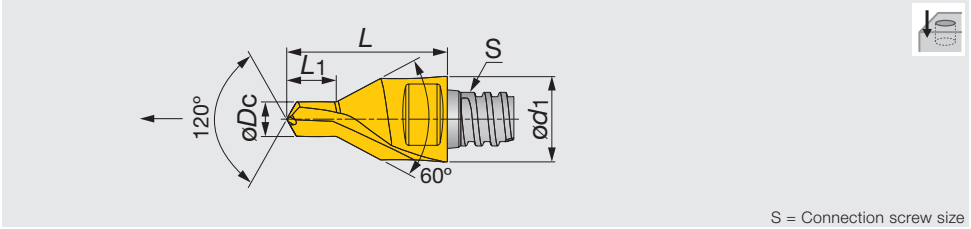
• Min. chamfering: ø1.5 mm
*Torque: Recommended torque (Nm) for clamping.
Packing quantity = 2 pcs.

# TUNGMEISTER

## VDP**-02...

TungMeister head for center drilling






S = Connection screw size

| Designation | AH725 | z | Helx | ø*Dc* | ø*d*1 | *L*1 | S | *L* | Wrench | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| VDP328L04.6A30-02S05 | ● | 2 | 0° | 3.28 | 8 | 4.6 | S05 | 15 | KEYV-S05 | 7 |
| VDP412L05.9A30-02S06 | ● | 2 | 0° | 4.12 | 10 | 5.9 | S06 | 19 | KEYV-S06 | 10 |
| VDP513L07.2A30-02S08 | ● | 2 | 0° | 5.13 | 12 | 7.2 | S08 | 23 | KEYV-S08 | 15 |
| VDP646L08.9A30-02S10 | ● | 2 | 0° | 6.46 | 16 | 8.9 | S10 | 28 | KEYV-S10 | 28 |

●: Line-up

*Torque: Recommended torque (Nm) for clamping.
Packing quantity = 2 pcs.

# STANDARD CUTTING CONDITIONS

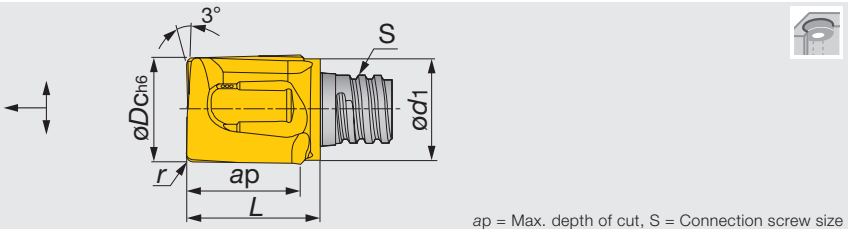
## Drilling (VCP, VDP)

| ISO | Workpiece material | | Hardness | Cutting speed *Vc* (m/min) | Feed: *f* (mm/rev) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | VDP328 | VDP412 | VDP513 | VDP646 | VCP |
| P | Low carbon steels C45, C55, etc. | | - 300 HB | 40 - 80 | 0.04 - 0.08 | 0.05 - 0.10 | 0.05 - 0.10 | 0.06 - 0.12 | 0.06 - 0.12 |
| P | High carbon steels 42CrMo4, 15Cr3, etc. | | - 300 HB | 30 - 50 | 0.04 - 0.08 | 0.05 - 0.10 | 0.05 - 0.10 | 0.06 - 0.12 | 0.06 - 0.12 |
| P | Prehardened steel PX5, NAK80, etc. | | 30 - 40 HRC | 20 - 30 | 0.04 - 0.08 | 0.05 - 0.10 | 0.05 - 0.10 | 0.06 - 0.12 | 0.06 - 0.12 |
| M | Stainless steels X5CrNi18-9, X5CrNiMo17-12-2, etc. | | - 200 HB | 15 - 25 | 0.04 - 0.08 | 0.05 - 0.10 | 0.05 - 0.10 | 0.06 - 0.12 | 0.06 - 0.12 |
| K | Grey cast irons 250, 300, etc. | | 150 - 250 HB | 60 - 100 | 0.05 - 0.09 | 0.07 - 0.12 | 0.07 - 0.12 | 0.12 - 0.18 | 0.12 - 0.18 |
| K | Ductile cast irons 400-15S, etc. | | 150 - 250 HB | 60 - 100 | 0.04 - 0.08 | 0.05 - 0.10 | 0.05 - 0.10 | 0.10 - 0.15 | 0.10 - 0.15 |
| S | Titanium alloys Ti-6Al-4V, etc. | | - | 15 - 25 | 0.04 - 0.07 | 0.04 - 0.07 | 0.04 - 0.07 | 0.04 - 0.07 | 0.04 - 0.07 |
| S | Heat-resistant alloys Inconel 718, etc. | | - | 10 - 20 | 0.03 - 0.06 | 0.03 - 0.06 | 0.03 - 0.06 | 0.03 - 0.06 | 0.03 - 0.06 |
| H | Hardened steel | X40CrMoV5 1, 55NiCrMoV6, etc. | 40 - 50 HRC | 15 - 25 | 0.04 - 0.07 | 0.04 - 0.07 | 0.04 - 0.07 | 0.04 - 0.07 | 0.04 - 0.07 |
| H | Hardened steel | X153CrMoV12, HS18-0-1, etc. | 50 - 60 HRC | 10 - 20 | 0.03 - 0.06 | 0.03 - 0.06 | 0.03 - 0.06 | 0.03 - 0.06 | 0.03 - 0.06 |

# VGC**-02...

TungMeister head for counter boring






ap = Max. depth of cut, S = Connection screw size

| Designation | AH725 | z | Helx | øDc | ød1 | Max. ap | r | S | L | Wrench | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VGC078L08.0R02-02S05 | ● | 2 | 10° | 7.8 | 7.60 | 8.0 | 0.20 | S05 | 10.0 | KEYV-S05 | 7.0 |
| VGC080L08.0R04-02S05 | ● | 2 | 10° | 8 | 7.60 | 8.0 | 0.40 | S05 | 10.0 | KEYV-S05 | 7.0 |
| VGC080L08.0R10-02S05 | ● | 2 | 10° | 8 | 7.60 | 8.0 | 1.00 | S05 | 10.0 | KEYV-S05 | 7.0 |
| VGC080L08.0R20-02S05 | ● | 2 | 10° | 8 | 7.60 | 8.0 | 2.00 | S05 | 10.0 | KEYV-S05 | 7.0 |
| VGC098L09.0R03-02S06 | ● | 2 | 10° | 9.8 | 9.50 | 9.5 | 0.30 | S06 | 12.4 | KEYV-S06 | 10.0 |
| VGC100L09.0R04-02S06 | ● | 2 | 10° | 10 | 9.50 | 9.5 | 0.40 | S06 | 12.4 | KEYV-S06 | 10.0 |
| VGC100L09.0R10-02S06 | ● | 2 | 10° | 10 | 9.50 | 9.5 | 1.00 | S06 | 12.4 | KEYV-S06 | 10.0 |
| VGC100L09.0R20-02S06 | ● | 2 | 10° | 10 | 9.50 | 9.5 | 2.00 | S06 | 12.4 | KEYV-S06 | 10.0 |
| VGC117L10.0R03-02S08 | ● | 2 | 10° | 11.7 | 11.50 | 10.0 | 0.30 | S08 | 14.2 | KEYV-S08 | 15.0 |
| VGC120L10.0R04-02S08 | ● | 2 | 10° | 12 | 11.50 | 10.0 | 0.40 | S08 | 14.2 | KEYV-S08 | 15.0 |
| VGC120L10.0R10-02S08 | ● | 2 | 10° | 12 | 11.50 | 10.0 | 1.00 | S08 | 14.2 | KEYV-S08 | 15.0 |
| VGC120L10.0R20-02S08 | ● | 2 | 10° | 12 | 11.50 | 10.0 | 2.00 | S08 | 14.2 | KEYV-S08 | 15.0 |
| VGC157L15.0R03-02S10 | ● | 2 | 10° | 15.7 | 15.20 | 15.0 | 0.30 | S10 | 19.0 | KEYV-S10 | 28.0 |
| VGC160L15.0R04-02S10 | ● | 2 | 10° | 16 | 15.20 | 15.0 | 0.40 | S10 | 19.0 | KEYV-S10 | 28.0 |
| VGC160L15.0R08-02S10 | ● | 2 | 10° | 16 | 15.20 | 15.0 | 0.80 | S10 | 19.0 | KEYV-S10 | 28.0 |

• Can drill with step feed
*Torque: Recommended torque (Nm) for clamping.
Packing quantity = 2 pcs.

●: Line-up



## STANDARD CUTTING CONDITIONS

### Counter boring (VGC)

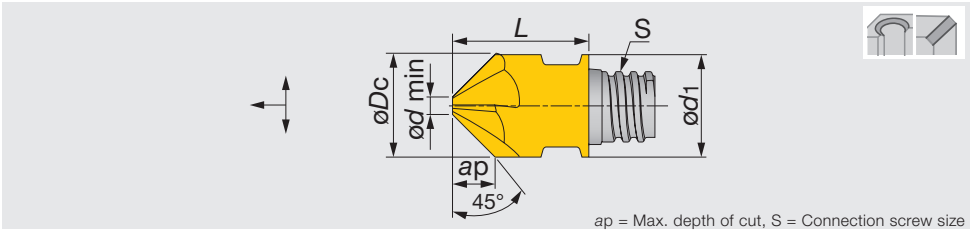
| ISO | Workpiece material | | Hardness | Cutting speed *Vc* (m/min) | Feed *f* (mm/rev) |
|---|---|---|---|---|---|
| P | Low carbon steels<br>C45, C55, etc. | | - 300 HB | 40 - 80 | 0.04 - 0.08 |
| | High carbon steels<br>42CrMo4, 15Cr3, etc. | | - 300 HB | 30 - 50 | 0.04 - 0.08 |
| | Prehardened steel<br>PX5, NAK80, etc. | | 30 - 40 HRC | 20 - 30 | 0.04 - 0.08 |
| M | Stainless steels<br>X5CrNi18-9, X5CrNiMo17-12-2, etc. | | - 200 HB | 15 - 25 | 0.04 - 0.08 |
| K | Grey cast irons<br>250, 300, etc. | | 150 - 250 HB | 60 - 100 | 0.05 - 0.09 |
| | Ductile cast irons<br>400-15S, etc. | | 150 - 250 HB | 60 - 100 | 0.04 - 0.08 |
| S | Titanium alloys<br>Ti-6Al-4V, etc. | | - | 15 - 25 | 0.04 - 0.07 |
| | Heat-resistant alloys<br>Inconel 718, etc. | | - | 10 - 20 | 0.03 - 0.06 |
| H | Hardened steel | X40CrMoV5 1, 55NiCrMoV6, etc. | 40 - 50 HRC | 15 - 25 | 0.04 - 0.07 |
| | | X153CrMoV12, HS18-0-1, etc. | 50 - 60 HRC | 10 - 20 | 0.03 - 0.06 |

・ When drilling, the step feed (woodpeckering feed) operation should be applied with the depth of 0.3 - 0.5 mm per step.
・ Apply the same cutting conditions as the VEE type head when conducting shoulder milling or slotting operations.

## TUNGMEISTER
### VCA**-04,06...

TungMeister head with 4 or 6 flutes for countersinking and chamfering






ap = Max. depth of cut, S = Connection screw size

| Designation | AH725 | z | Helx | øDc | ød1 | Max. ap | ød min | S | L | Wrench | Torque** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VCA100L04.0A45-04S06 | ● | 4 | 0° | 10 | 10 | 4 | 1.95 | S06 | 13 | KEYV-S06 | 10 |
| VCA120L05.0A45-04S08 | ● | 4 | 0° | 12 | 12 | 5 | 1.95 | S08 | 16.5 | KEYV-S08 | 15 |
| VCA127L05.3A45-04S08 | ● | 4 | 0° | 12.7 | 12.7 | 5.3 | 1.98 | S08 | 16.5 | KEYV-S08 | 15 |
| VCA160L06.5A45-06S10 | ● | 6 | 0° | 16 | 16 | 6.5 | 3 | S10 | 20.3 | KEYV-S10 | 28 |
| VCA200L07.5A45-06S12 | ● | 6 | 0° | 20 | 18.3 | 7.5 | 5 | S12 | 25.5 | KEYV-S12 | 28 |

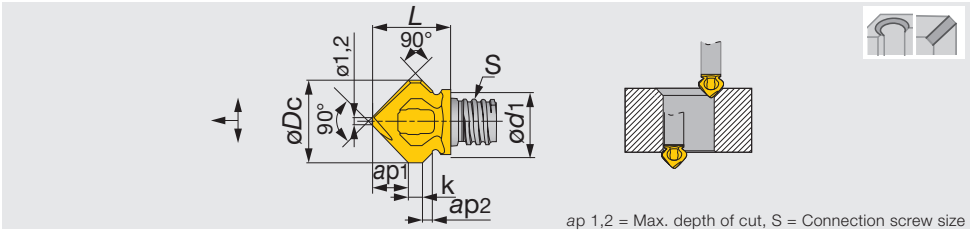
**Torque: Recommended torque (Nm) for clamping.
Packing quantity = 2 pcs.

●: Line-up

## TUNGMEISTER
### VCW**-02...

TungMeister head for countersinking, top and bottom chamfering






ap 1,2 = Max. depth of cut, S = Connection screw size

| Designation | AH725 | z | Helx | øDc | ød1 | ap1 | ap2 | k | S | L | Wrench | Torque** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VCW118L05.0A45-02S06 | ● | 2 | 0° | 11.8 | 9.3 | 5 | 1.2 | 2 | S06 | 11.2 | KEYV-S08 | 10 |

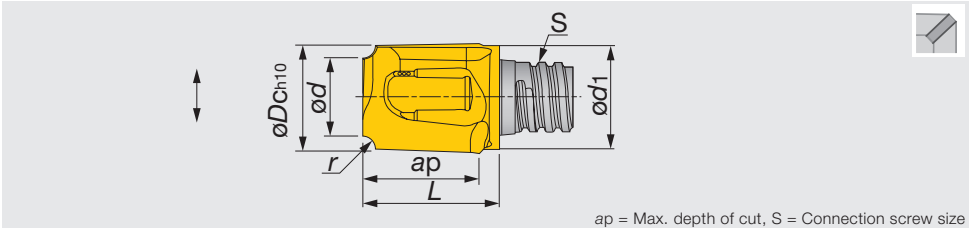
• Available for chamfering of reverse side
* Some heads require different size of wrench.
**Torque: Recommended torque (Nm) for clamping.
Packing quantity = 2 pcs.

●: Line-up

## TUNGMEISTER
### VCR**-02...

TungMeister head with 2 pressed flutes for concave raidus chamfering






ap = Max. depth of cut, S = Connection screw size

| Designation | AH725 | z | Helx | øDc | ød1 | ød | Max. ap | r | S | L | Wrench | Torque** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VCR080L07.5R10-02S05 | ● | 2 | 0° | 8 | 7.6 | 5.8 | 7.5 | 1 | S05 | 10.5 | KEYV-S05 | 7 |
| VCR100L09.5R16-02S06 | ● | 2 | 0° | 10 | 9.5 | 6.8 | 9.5 | 1.6 | S06 | 12.5 | KEYV-S06 | 10 |
| VCR100L09.5R25-02S06 | ● | 2 | 0° | 10 | 9.5 | 5.1 | 9.5 | 2.5 | S06 | 12.5 | KEYV-S06 | 10 |
| VCR127L12.0R30-02S08 | ● | 2 | 0° | 12.7 | 12.2 | 6.5 | 12.0 | 3 | S08 | 15.6 | KEYV-S08 | 15 |
| VCR127L12.0R40-02S08 | ● | 2 | 0° | 12.7 | 12.2 | 4.7 | 12.0 | 4 | S08 | 15.6 | KEYV-S08 | 15 |
| VCR160L15.0R50-02S10 | ● | 2 | 0° | 16 | 15.2 | 6.2 | 15.0 | 5 | S10 | 19.1 | KEYV-S10 | 28 |
| VCR200L07.0R60-02S12 | ● | 2 | 0° | 20 | 18.3 | 8 | 7.0 | 6 | S12 | 17.4 | KEYV-S12 | 28 |

**Torque: Recommended torque (Nm) for clamping.
Packing quantity = 2 pcs.

●: Line-up

## STANDARD CUTTING CONDITIONS

### Chamfering and countersinking (VCA, VCW, VCR, VCP)

| ISO | Workpiece material | | Hardness | Cutting speed *Vc* (m/min) | Feed *f* (mm/rev) |
|---|---|---|---|---|---|
| P | Low carbon steels<br>C45, C55, etc. | | - 300 HB | 60 - 100 | 0.06 - 0.12 |
| P | High carbon steels<br>42CrMo4, 15Cr3, etc. | | - 300 HB | 50 - 80 | 0.06 - 0.12 |
| P | Prehardened steel<br>PX5, NAK80, etc. | | 30 - 40 HRC | 40 - 70 | 0.06 - 0.12 |
| M | Stainless steels<br>X5CrNi18-9, X5CrNiMo17-12-2, etc. | | - 200 HB | 30 - 50 | 0.06 - 0.12 |
| K | Grey cast irons<br>250, 300, etc. | | 150 - 250 HB | 80 - 120 | 0.06 - 0.12 |
| K | Ductile cast irons<br>400-15S, etc. | | 150 - 250 HB | 80 - 120 | 0.06 - 0.12 |
| N | Aluminium alloys | | - | 100 - 200 | 0.08 - 0.15 |
| S | Titanium alloys<br>Ti-6Al-4V, etc. | | - | 30 - 50 | 0.05 - 0.1 |
| S | Heat-resistant alloys<br>Inconel 718, etc. | | - | 20 - 40 | 0.04 - 0.08 |
| H | Hardened steel | X40CrMoV5 1, 55NiCrMoV6, etc. | 40 - 50 HRC | 30 - 50 | 0.05 - 0.1 |
| H | Hardened steel | X153CrMoV12, HS18-0-1, etc. | 50 - 60 HRC | 20 - 40 | 0.04 - 0.08 |

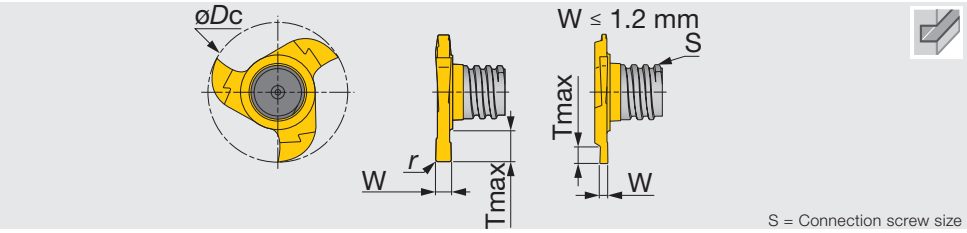
## TOLERANCE OF TOOL DIAMETER

| Basic dimensions (mm) | | Permissible dimensional deviations (μm) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| > | ≤ | e8 | e9 | h6 | h7 | h9 | h10 | z9 |
| 6 | 10 | -25<br>-47 | -25<br>-61 | 0<br>-9 | 0<br>-15 | 0<br>-36 | 0<br>-58 | +78<br>+42 |
| 10 | 14 | -32<br>-59 | -32<br>-75 | 0<br>-11 | 0<br>-18 | 0<br>-43 | 0<br>-70 | +93<br>+50 |
| 14 | 18 | -32<br>-59 | -32<br>-75 | 0<br>-11 | 0<br>-18 | 0<br>-43 | 0<br>-70 | +103<br>+60 |
| 18 | 30 | -40<br>-73 | -40<br>-92 | 0<br>-13 | 0<br>-21 | 0<br>-52 | 0<br>-84 | - |

● JISB0401-2: 1998 (ISO286-2: 1988) extract

TungMeister head for slotting of 1.5 - 3.17mm width with 3 teeth






S = Connection screw size

| Designation | GH130 | z | Helx | øDc | W± 0.02 | r | S | T max | Wrench | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| VST157W1.50R010-3S06 | ● | 3 | 0 | 15.7 | 1.5 | 0.1 | S06 | 2.8 | KEYV-177 | 10 |
| VST157W1.57R020-3S06 | ● | 3 | 0 | 15.7 | 1.57 | 0.2 | S06 | 2.8 | KEYV-177 | 10 |
| VST157W2.00R020-3S06 | ● | 3 | 0 | 15.7 | 2 | 0.2 | S06 | 2.8 | KEYV-177 | 10 |
| VST157W2.39R020-3S06 | ● | 3 | 0 | 15.7 | 2.39 | 0.2 | S06 | 2.8 | KEYV-177 | 10 |
| VST157W2.50R020-3S06 | ● | 3 | 0 | 15.7 | 2.5 | 0.2 | S06 | 2.8 | KEYV-177 | 10 |
| VST157W3.00R020-3S06 | ● | 3 | 0 | 15.7 | 3 | 0.2 | S06 | 2.8 | KEYV-177 | 10 |
| VST157W3.17R020-3S06 | ● | 3 | 0 | 15.7 | 3.17 | 0.2 | S06 | 2.8 | KEYV-177 | 10 |
| VST177W1.20R005-3S06 | ● | 3 | 0 | 17.7 | 1.2(1) | 0.05 | S06 | 3.8 | KEYV-177 | 10 |
| VST177W1.40R005-3S06 | ● | 3 | 0 | 17.7 | 1.4(1) | 0.05 | S06 | 3.8 | KEYV-177 | 10 |
| VST177W1.50R010-3S06 | ● | 3 | 0 | 17.7 | 1.5 | 0.1 | S06 | 3.8 | KEYV-177 | 10 |
| VST177W1.57R020-3S06 | ● | 3 | 0 | 17.7 | 1.57 | 0.2 | S06 | 3.8 | KEYV-177 | 10 |
| VST177W1.70R005-3S06 | ● | 3 | 0 | 17.7 | 1.7(1) | 0.05 | S06 | 3.8 | KEYV-177 | 10 |
| VST177W2.00R020-3S06 | ● | 3 | 0 | 17.7 | 2 | 0.2 | S06 | 3.8 | KEYV-177 | 10 |
| VST177W2.20R110-3S06 | ● | 3 | 0 | 17.7 | 2.20 | 1.1 | S06 | 3.8 | KEYV-177 | 10 |
| VST177W2.39R020-3S06 | ● | 3 | 0 | 17.7 | 2.39 | 0.2 | S06 | 3.8 | KEYV-177 | 10 |
| VST177W2.50R020-3S06 | ● | 3 | 0 | 17.7 | 2.5 | 0.2 | S06 | 3.8 | KEYV-177 | 10 |
| VST177W3.00R020-3S06 | ● | 3 | 0 | 17.7 | 3 | 0.2 | S06 | 3.8 | KEYV-177 | 10 |
| VST177W3.17R020-3S06 | ● | 3 | 0 | 17.7 | 3.17 | 0.2 | S06 | 3.8 | KEYV-177 | 10 |

(1) W is based on DIN471 / 472
*Torque: Recommended torque (Nm) for clamping.
Packing quantity = 2 pcs.

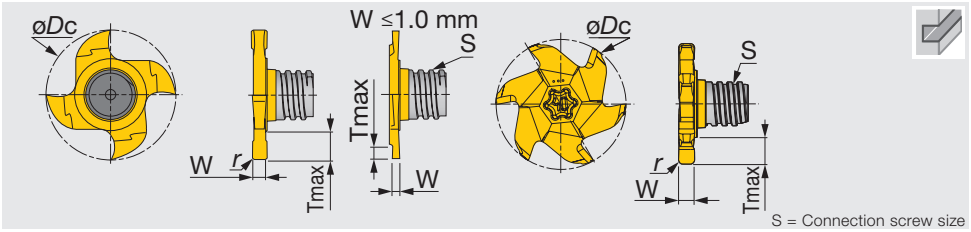
●: Line-up

# TUNGMEISTER

## VST**-4,6...

TungMeister head for slotting of 0.76 - 10mm width with 4, 6 teeth






| Designation | GH130 | Helx | z | øDc | W ± 0.02 | r | S | T max | Wrench | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| VST217W0.76R000-4S08 | ● | 0 | 4 | 21.7 | 0.76(1) | - | S08 | 1.5 | KEYV-217 | 15 |
| VST217W0.86R000-4S08 | ● | 0 | 4 | 21.7 | 0.86(1) | - | S08 | 1.7 | KEYV-217 | 15 |
| VST217W0.96R000-4S08 | ● | 0 | 4 | 21.7 | 0.96(1) | - | S08 | 1.9 | KEYV-217 | 15 |
| VST217W1.00R005-4S08 | ● | 0 | 4 | 21.7 | 1 | 0.05 | S08 | 2 | KEYV-217 | 15 |
| VST217W1.20R005-4S08 | ● | 0 | 4 | 21.7 | 1.2(1) | 0.05 | S08 | 4.5 | KEYV-217 | 15 |
| VST217W1.40R005-4S08 | ● | 0 | 4 | 21.7 | 1.4(1) | 0.05 | S08 | 4.5 | KEYV-217 | 15 |
| VST217W1.57R000-4S08 | ● | 0 | 4 | 21.7 | 1.57 | - | S08 | 4.5 | KEYV-217 | 15 |
| VST217W1.70R010-4S08 | ● | 0 | 4 | 21.7 | 1.7(1) | 0.1 | S08 | 4.5 | KEYV-217 | 15 |
| VST217W1.95R020-4S08 | ● | 0 | 4 | 21.7 | 1.95(1) | 0.2 | S08 | 4.5 | KEYV-217 | 15 |
| VST217W2.00R020-4S08 | ● | 0 | 4 | 21.7 | 2 | 0.2 | S08 | 4.5 | KEYV-217 | 15 |
| VST217W2.25R020-4S08 | ● | 0 | 4 | 21.7 | 2.25(1) | 0.2 | S08 | 4.5 | KEYV-217 | 15 |
| VST217W2.39R020-4S08 | ● | 0 | 4 | 21.7 | 2.39 | 0.2 | S08 | 4.5 | KEYV-217 | 15 |
| VST217W2.50R020-4S08 | ● | 0 | 4 | 21.7 | 2.5 | 0.2 | S08 | 4.5 | KEYV-217 | 15 |
| VST217W2.75R020-4S08 | ● | 0 | 4 | 21.7 | 2.75(1) | 0.2 | S08 | 4.5 | KEYV-217 | 15 |
| VST217W3.00R020-4S08 | ● | 0 | 4 | 21.7 | 3 | 0.2 | S08 | 4.5 | KEYV-217 | 15 |
| VST217W3.17R020-4S08 | ● | 0 | 4 | 21.70 | 3.17 | 0.2 | S08 | 4.5 | KEYV-217 | 15 |
| VST217W3.25R020-4S08 | ● | 0 | 4 | 21.7 | 3.25(1) | 0.2 | S08 | 4.5 | KEYV-217 | 15 |
| VST217W4.00R020-4S08 | ● | 0 | 4 | 21.7 | 4 | 0.2 | S08 | 4.5 | KEYV-217 | 15 |
| VST217W4.25R020-4S08 | ● | 0 | 4 | 21.7 | 4.25(1) | 0.2 | S08 | 4.5 | KEYV-217 | 15 |
| VST217W4.75R020-4S08 | ● | 0 | 4 | 21.7 | 4.75 | 0.2 | S08 | 4.5 | KEYV-217 | 15 |
| VST217W5.25R020-4S08 | ● | 0 | 4 | 21.7 | 5.25(1) | 0.2 | S08 | 4.5 | KEYV-217 | 15 |
| VST277W2.50R020-6S10 | ● | 0 | 6 | 27.7 | 2.5 | 0.2 | S10 | 6 | KEYV-T40L | 28 |
| VST277W5.25R020-6S10 | ● | 0 | 6 | 27.7 | 5.25 | 0.2 | S10 | 6 | KEYV-T40L | 28 |
| VST277W10.0R020-6S10 | ● | 0 | 6 | 27.7 | 10 | 0.2 | S10 | 6 | KEYV-T40L | 28 |

(1) W is based on DIN471 / 472
*Torque: Recommended torque (Nm) for clamping.
Packing quantity = 2 pcs.

●: Line-up

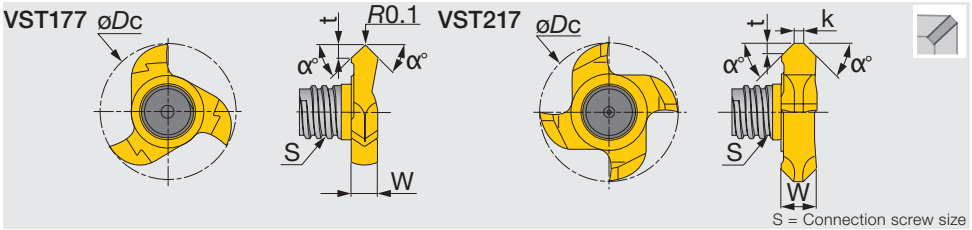


# TUNGMEISTER

## VST**-A45...

TungMeister head for chamfering on slots






| Designation | GH130 | z | Helx | øDc | W | α° | S | t | k | Wrench | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VST177L01.40A45-3S06 | ● | 3 | 0 | 17.7 | 3.4 | 45 | S06 | 1.4 | - | KEYV-177 | 10 |
| VST217L01.70A45-4S08 | ● | 4 | 0 | 21.7 | 5.5 | 45 | S08 | 1.7 | 1.5 | KEYV-217 | 15 |

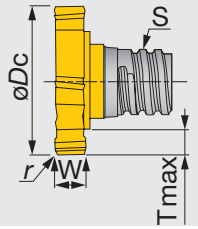
*Torque: Recommended torque (Nm) for clamping.
Packing quantity = 2 pcs.

●: Line-up

## VTB**-06...

TungMeister head for T-slotting of 3 - 8mm width






S = Connection screw size

| Designation | GH130 | z | Helx | øDc -0 -0.05 | W± 0.02 | T max | S | r | Wrench | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| VTB135W3.00R04-06S05 | ● | 6 | 0° | 13.5 | 3 | 2.65 | S05 | 0.4 | KEYV-T20 | 7 |
| VTB135W4.00R04-06S05 | ● | 6 | 0° | 13.5 | 4 | 2.65 | S05 | 0.4 | KEYV-T20 | 7 |
| VTB160W2.00R04-06S06 | ● | 6 | 0° | 16 | 2 | 2.9 | S06 | 0.4 | KEYV-T20 | 10 |
| VTB160W3.00R04-06S06 | ● | 6 | 0° | 16 | 3 | 2.9 | S06 | 0.4 | KEYV-T25 | 10 |
| VTB160W4.00R04-06S06 | ● | 6 | 0° | 16 | 4 | 2.9 | S06 | 0.4 | KEYV-T25 | 10 |
| VTB165W2.00R04-06S06 | ● | 6 | 0° | 16.5 | 2 | 3.15 | S06 | 0.4 | KEYV-T20 | 10 |
| VTB165W3.00R04-06S06 | ● | 6 | 0° | 16.5 | 3 | 3.15 | S06 | 0.4 | KEYV-T25 | 10 |
| VTB165W4.00R04-06S06 | ● | 6 | 0° | 16.5 | 4 | 3.15 | S06 | 0.4 | KEYV-T25 | 10 |
| VTB195W4.00R04-06S08 | ● | 6 | 0° | 19.5 | 4 | 3.45 | S08 | 0.4 | KEYV-T30L | 15 |
| VTB195W5.00R04-06S08 | ● | 6 | 0° | 19.5 | 5 | 3.45 | S08 | 0.4 | KEYV-T30L | 15 |
| VTB195W6.00R04-06S08 | ● | 6 | 0° | 19.5 | 6 | 3.45 | S08 | 0.4 | KEYV-T30L | 15 |
| VTB225W5.00R04-06S08 | ● | 6 | 0° | 22.5 | 5 | 4.95 | S08 | 0.4 | KEYV-T40L | 15 |
| VTB225W6.00R04-06S08 | ● | 6 | 0° | 22.5 | 6 | 4.95 | S08 | 0.4 | KEYV-T40L | 15 |
| VTB225W8.00R04-06S08 | ● | 6 | 0° | 22.5 | 8 | 4.95 | S08 | 0.4 | KEYV-T40L | 15 |
| VTB250W6.00R04-06S08 | ● | 6 | 0° | 25 | 6 | 5.9 | S08 | 0.4 | KEYV-T50L | 15 |
| VTB250W8.00R04-06S08 | ● | 6 | 0° | 25 | 8 | 5.9 | S08 | 0.4 | KEYV-T50L | 15 |
| VTB250W5.00R04-06S10 | ● | 6 | 0° | 25 | 5 | 4.3 | S10 | 0.4 | KEYV-T50L | 28 |
| VTB250W6.00R04-06S10 | ● | 6 | 0° | 25 | 6 | 4.3 | S10 | 0.4 | KEYV-T50L | 28 |
| VTB250W8.00R04-06S10 | ● | 6 | 0° | 25 | 8 | 4.3 | S10 | 0.4 | KEYV-T50L | 28 |

*Torque: Recommended torque (Nm) for clamping.
Packing quantity = 2 pcs.

●: Line-up

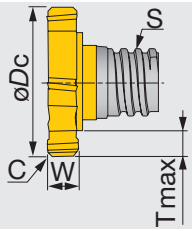


TUNGMEISTER

## VTB**C15...

TungMeister head for T-slotting of 2 mm width with chamfered edges






S = Connection screw size

| Designation | GH130 | z | Helx | øDc -0 -0.05 | W± 0.05 | T max | S | C | Wrench | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| VTB135W2.00C15-06S05 | ● | 6 | 0° | 13.5 | 2 | 2.65 | S05 | 0.15 | KEYV-T20 | 7 |

*Torque: Recommended torque (Nm) for clamping.
Packing quantity = 2 pcs.

●: Line-up

## STANDARD CUTTING CONDITIONS

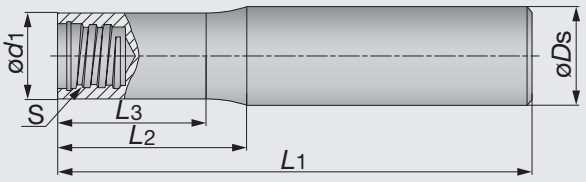
### Slotting (VST, VTB)

| ISO | Workpiece material | Hardness HB | VST type | | VTB type | |
|---|---|---|---|---|---|---|
| | | | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) |
| P | Low carbon steels C45, C55, etc. | - 300 | 80 - 180 | 0.05 - 0.15 | 80 - 180 | 0.08 - 0.18 |
| P | High carbon steels 42CrMo4, 15Cr3, etc. | - 300 | 60 - 120 | 0.04 - 0.12 | 60 - 120 | 0.05 - 0.15 |
| M | Stainless steels X5CrNi18-9, X5CrNiMo17-12-2, etc. | - 200 | 50 - 120 | 0.04 - 0.12 | 50 - 120 | 0.05 - 0.15 |
| K | Grey cast irons 250, 300, etc. | 150 - 250 | 100 - 200 | 0.05 - 0.15 | 100 - 200 | 0.08 - 0.18 |
| K | Ductile cast irons 400-15S, etc. | 150 - 250 | 100 - 200 | 0.04 - 0.12 | 100 - 200 | 0.05 - 0.15 |
| N | Aluminium alloys Si < 13% | - | 200 - 600 | 0.05 - 0.15 | 200 - 600 | 0.08 - 0.18 |
| N | Aluminium alloys Si ≥13% | - | 100 - 300 | 0.03 - 0.13 | 100 - 300 | 0.05 - 0.15 |
| S | Titanium alloys Ti-6Al-4V, etc. | - | 40 - 60 | 0.04 - 0.12 | 40 - 60 | 0.05 - 0.15 |
| S | Heat-resistant alloys Inconel 718, etc. | - | 15 - 35 | 0.02 - 0.1 | 15 - 35 | 0.02 - 0.1 |

## VSSD type

TungMeister, straight neck and cylindrical shank






S = Connection screw size

| Designation | øDs | ød1 | L1 | L2 | L3 | S | Type | Material |
|---|---|---|---|---|---|---|---|---|
| VSSD08L060S05-S | 8 | 7.6 | 60 | 15 | 12.80 | S05 | CYLINDRICAL | STEEL |
| VSSD08L070S05-C | 8 | 7.6 | 70 | 20 | 19 | S05 | CYLINDRICAL | CARBIDE |
| VSSD08L090S05-C | 8 | 7.6 | 90 | 40 | 39 | S05 | CYLINDRICAL | CARBIDE |
| VSSD08L110S05-C | 8 | 7.6 | 110 | 60 | 59 | S05 | CYLINDRICAL | CARBIDE |
| VSSD10L070S06-C | 10 | 9.6 | 70 | 20 | 18.5 | S06 | CYLINDRICAL | CARBIDE |
| VSSD10L075S06-S | 10 | 9.6 | 75 | 20 | 17.7 | S06 | CYLINDRICAL | STEEL |
| VSSD10L090S06-C | 10 | 9.6 | 90 | 40 | 38.5 | S06 | CYLINDRICAL | CARBIDE |
| VSSD10L110S06-C | 10 | 9.6 | 110 | 60 | 58.5 | S06 | CYLINDRICAL | CARBIDE |
| VSSD10L150S06-C | 10 | 9.6 | 150 | 100 | 98.5 | S06 | CYLINDRICAL | CARBIDE |
| VSSD12L070S08-C | 12 | 11.5 | 70 | 20 | 17 | S08 | CYLINDRICAL | CARBIDE |
| VSSD12L090S08-C | 12 | 11.5 | 90 | 40 | 37 | S08 | CYLINDRICAL | CARBIDE |
| VSSD12L090S08-S | 12 | 11.5 | 90 | 16 | 13.6 | S08 | CYLINDRICAL | STEEL |
| VSSD12L110S08-C | 12 | 11.5 | 110 | 60 | 57 | S08 | CYLINDRICAL | CARBIDE |
| VSSD12L130S08-C | 12 | 11.5 | 130 | 80 | 77 | S08 | CYLINDRICAL | CARBIDE |
| VSSD16L090S10-C | 16 | 15.2 | 90 | 40 | 38 | S10 | CYLINDRICAL | CARBIDE |
| VSSD16L100S10-S | 16 | 15.2 | 100 | 20 | 18 | S10 | CYLINDRICAL | STEEL |
| VSSD16L110S10-C | 16 | 15.2 | 110 | 60 | 58 | S10 | CYLINDRICAL | CARBIDE |
| VSSD16L130S10-C | 16 | 15.2 | 130 | 80 | 78 | S10 | CYLINDRICAL | CARBIDE |
| VSSD16L150S10-C | 16 | 15.2 | 150 | 100 | 98 | S10 | CYLINDRICAL | CARBIDE |
| VSSD20L090S12-C | 20 | 18.3 | 90 | 40 | 37 | S12 | CYLINDRICAL | CARBIDE |
| VSSD20L120S12-S | 20 | 18.3 | 120 | 25 | 20.5 | S12 | CYLINDRICAL | STEEL |
| VSSD20L130S12-C | 20 | 18.3 | 130 | 80 | 77 | S12 | CYLINDRICAL | CARBIDE |
| VSSD20L200S12-C | 20 | 18.3 | 200 | 120 | 117 | S12 | CYLINDRICAL | CARBIDE |
| VSSD25L120S15-C | 25 | 23.9 | 120 | 60 | 58 | S15 | CYLINDRICAL | CARBIDE |
| VSSD25L135S15-S | 25 | 23.9 | 135 | 35 | 33 | S15 | CYLINDRICAL | STEEL |
| VSSD25L170S15-C | 25 | 23.9 | 170 | 100 | 98 | S15 | CYLINDRICAL | CARBIDE |
| VSSD25L250S15-C | 25 | 23.9 | 250 | 150 | 148 | S15 | CYLINDRICAL | CARBIDE |

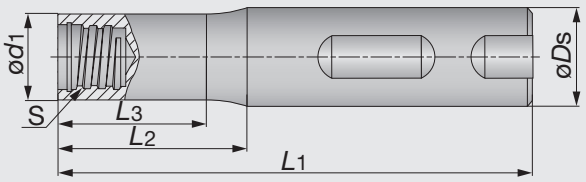


TUNGMEISTER

## VSSD-W type

TungMeister, straight neck and weldon shank





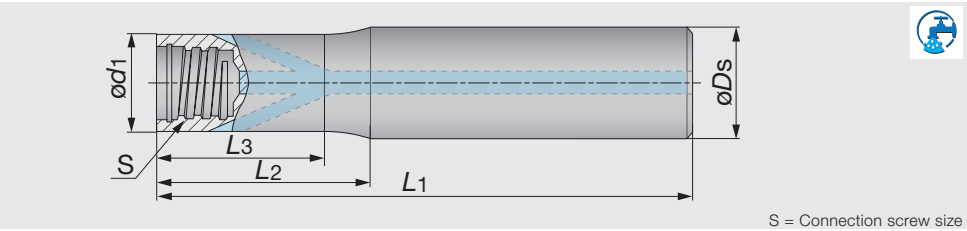

S = Connection screw size

| Designation | øDs | ød1 | L1 | L2 | L3 | S | Shank | Material |
|---|---|---|---|---|---|---|---|---|
| VSSD12L055W05-S | 12 | 7.6 | 55 | 3.8 | - | S05 | WELDON | STEEL |
| VSSD16L065W06-S | 16 | 9.6 | 65 | 6 | - | S06 | WELDON | STEEL |
| VSSD16L065W08-S | 16 | 11.5 | 65 | 4 | - | S08 | WELDON | STEEL |
| VSSD20L070W10-S | 20 | 15.2 | 70 | 4 | - | S10 | WELDON | STEEL |
| VSSD25L075W12-S | 25 | 18.3 | 75 | 6 | - | S12 | WELDON | STEEL |

## VSSD-W-A type

TungMeister, straight shank and neck with coolant hole






S = Connection screw size

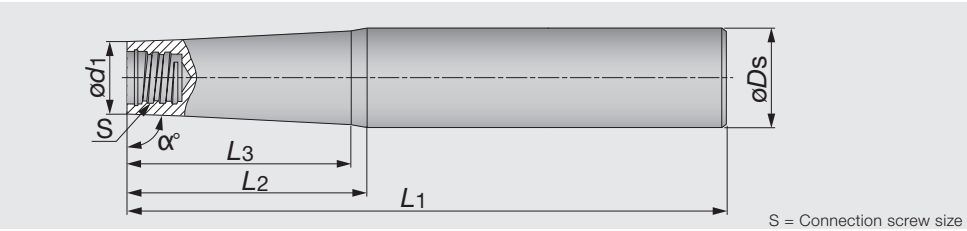
| Designation | øDs | ød1 | L1 | L2 | L3 | S | Material |
|---|---|---|---|---|---|---|---|
| VSSD10L070S06-W-A | 10 | 9.6 | 70 | 20 | 19 | S06 | TUNGSTEN |
| VSSD10L090S06-W-A | 10 | 9.6 | 90 | 40 | 39 | S06 | TUNGSTEN |
| VSSD10L110S06-W-A | 10 | 9.6 | 110 | 60 | 59 | S06 | TUNGSTEN |
| VSSD12L070S08-W-A | 12 | 11.5 | 70 | 20 | 19 | S08 | TUNGSTEN |
| VSSD12L090S08-W-A | 12 | 11.5 | 90 | 40 | 39 | S08 | TUNGSTEN |
| VSSD12L110S08-W-A | 12 | 11.5 | 110 | 60 | 59 | S08 | TUNGSTEN |
| VSSD12L130S08-W-A | 12 | 11.5 | 130 | 80 | 79 | S08 | TUNGSTEN |
| VSSD16L070S10-W-A | 16 | 15.2 | 70 | 20 | 18.5 | S10 | TUNGSTEN |
| VSSD16L090S10-W-A | 16 | 15.2 | 90 | 40 | 36.5 | S10 | TUNGSTEN |
| VSSD16L110S10-W-A | 16 | 15.2 | 110 | 60 | 58.5 | S10 | TUNGSTEN |
| VSSD16L130S10-W-A | 16 | 15.2 | 130 | 80 | 78.5 | S10 | TUNGSTEN |
| VSSD20L090S12-W-A | 20 | 18.3 | 90 | 40 | 37 | S12 | TUNGSTEN |
| VSSD20L130S12-W-A | 20 | 18.3 | 130 | 80 | 77 | S12 | TUNGSTEN |

TUNGMEISTER

## VTSD type

TungMeister, straight shank and taper neck






S = Connection screw size

| Designation | α° | øDs | ød1 | L1 | L2 | L3 | S | Material |
|---|---|---|---|---|---|---|---|---|
| VTSD12L080S05-S | 85 | 12 | 7.6 | 80 | 25 | - | S05 | STEEL |
| VTSD12L100S05-S | 89 | 12 | 7.6 | 100 | 35 | 31 | S05 | STEEL |
| VTSD12L110S05-C | 89 | 12 | 7.6 | 110 | 60 | 58 | S05 | CARBIDE |
| VTSD12L130S05-C | 89 | 12 | 7.6 | 130 | 80 | 79 | S05 | CARBIDE |
| VTSD16L125S06-S | 85 | 16 | 9.6 | 125 | 34 | 31.6 | S06 | STEEL |
| VTSD16L130S08-C | 89 | 16 | 11.5 | 130 | 80 | 78.8 | S08 | CARBIDE |
| VTSD16L140S08-S | 85 | 16 | 11.5 | 140 | 22 | 19.3 | S08 | STEEL |
| VTSD16L150S05-C | 89 | 16 | 7.6 | 150 | 100 | 96 | S05 | CARBIDE |
| VTSD16L150S06-C | 89 | 16 | 9.6 | 150 | 100 | 98 | S06 | CARBIDE |
| VTSD16L150S08-C | 89 | 16 | 11.5 | 150 | 100 | - | S08 | CARBIDE |
| VTSD16L160S06-S | 89 | 16 | 9.6 | 160 | 55 | 45.9 | S06 | STEEL |
| VTSD16L170S06-C | 89 | 16 | 9.6 | 170 | 120 | 119 | S06 | CARBIDE |
| VTSD20L140S10-S | 85 | 20 | 15.2 | 140 | 27.5 | - | S10 | STEEL |
| VTSD20L170S08-C | 89 | 20 | 11.5 | 170 | 120 | 117 | S08 | CARBIDE |
| VTSD20L170S08-S | 89 | 20 | 11.5 | 170 | 80 | 68.6 | S08 | STEEL |
| VTSD20L170S10-C | 89 | 20 | 15.2 | 170 | 120 | - | S10 | CARBIDE |
| VTSD20L190S10-C | 89 | 20 | 15.2 | 190 | 140 | - | S10 | CARBIDE |
| VTSD20L190S10-S | 89 | 20 | 15.2 | 190 | 80 | 73 | S10 | STEEL |
| VTSD20L210S10-C | 89 | 20 | 15.2 | 210 | 160 | - | S10 | CARBIDE |
| VTSD25L160S12-S | 85 | 25 | 18.3 | 160 | 40 | - | S12 | STEEL |
| VTSD25L170S10-S | 85 | 25 | 15.2 | 170 | 56 | - | S10 | STEEL |
| VTSD25L180S12-C | 89 | 25 | 18.3 | 180 | 120 | - | S12 | CARBIDE |
| VTSD25L210S12-S | 89 | 25 | 18.3 | 210 | 100 | 91 | S12 | STEEL |
| VTSD25L250S12-C | 89 | 25 | 18.3 | 250 | 140 | - | S12 | CARBIDE |
| VTSD32L155S15-S | 85 | 32 | 23.9 | 155 | 45 | 40 | S15 | STEEL |
| VTSD32L190S12-S | 85 | 32 | 18.3 | 190 | 80 | - | S12 | STEEL |
| VTSD32L220S15-S | 85 | 32 | 23.9 | 220 | 100 | - | S15 | STEEL |
| VTSD32L250S15-C | 89 | 32 | 23.9 | 250 | 150 | - | S15 | CARBIDE |
| VTSD32L300S15-C | 89 | 32 | 23.9 | 300 | 200 | - | S15 | CARBIDE |

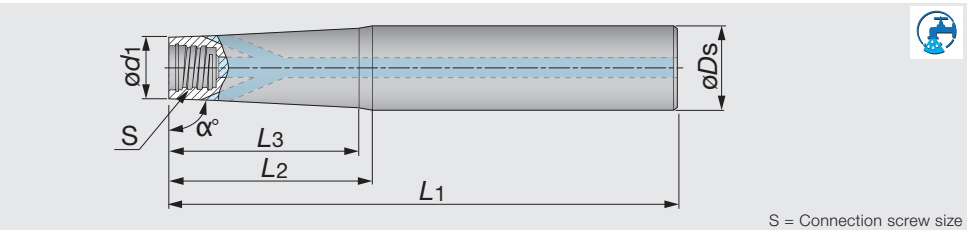


TUNGMEISTER

## VTSD-W-A type

TungMeister, straight shank and taper neck with coolant hole



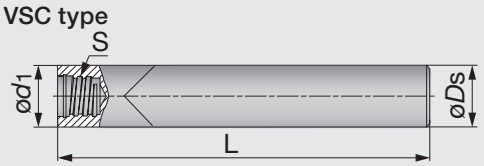


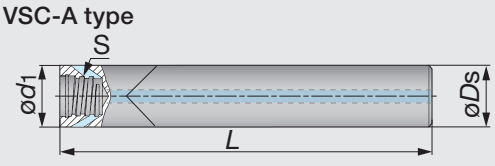

S = Connection screw size

| Designation | α° | øDs | ød1 | L1 | L2 | L3 | S | Material |
|---|---|---|---|---|---|---|---|---|
| VTSD12L110S06-W-A | 89 | 12 | 9.6 | 110 | 60 | 59 | S06 | TUNGSTEN |
| VTSD16L170S06-W-A | 89 | 16 | 9.6 | 170 | 120 | 116 | S06 | TUNGSTEN |

# TUNGMEISTER
## VSC type

TungMeister, straight shank for VST type slotting heads




S = Connection screw size

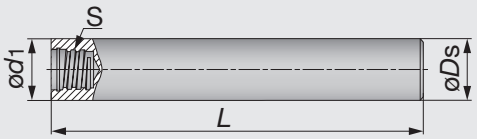
| Designation | øDs | ød1 | L | S | Air hole | Material |
|---|---|---|---|---|---|---|
| VSC100L100S06-C | 10 | 10 | 100 | S06 | without | CARBIDE |
| VSC120L100S08-C-A | 12 | 12 | 100 | S08 | with | CARBIDE |

Note: • For VSC-C type shank, just VST slotting head is recommended.
If other heads are used on the VSC-C shank, the depth of cut must be smaller than the max. ap in each head.
The VSC-C type shank does not have external clearance, so the shank may interfere with the work piece.

# TUNGMEISTER
## VSTD type

TungMeister, straight shank for VTB type slotting heads






S = Connection screw size

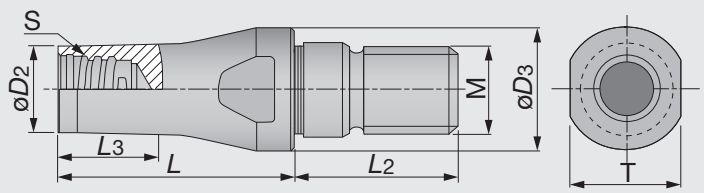
| Designation | øDs | ød1 | L | S | Material |
|---|---|---|---|---|---|
| VSTD08L070S05-S | 8 | 8 | 70 | S05 | STEEL |
| VSTD10L080S06-S | 10 | 10 | 80 | S06 | STEEL |
| VSTD12L090S08-S | 12 | 12 | 90 | S08 | STEEL |
| VSTD16L100S10-S | 16 | 16 | 100 | S10 | STEEL |

Note: • For VSTD type shank, just VTB grooving head is recommended.
If other heads are used on the VSTD shank, the depth of cut must be smaller than the max. ap in each head.
The VSTD type shank does not have external clearance, so the shank may interfere with the work piece.

# TUNGHOLD TUNGFLEX
## VAD-M adaptor

TungFlex conversion adaptor with TungMeister






S = Connection screw size

| Designation | øD2 | øD3 | L | L2 | L3 | S | M | T |
|---|---|---|---|---|---|---|---|---|
| VAD130L016S08-S-M8 | 11.7 | 13 | 16 | 17.5 | 6 | S08 | M8 | 11 |
| VAD130L025S08-S-M8 | 11.7 | 13 | 25 | 17.5 | 20 | S08 | M8 | 11 |
| VAD180L020S08-S-M10 | 11.7 | 18 | 20 | 20 | 12 | S08 | M10 | 13 |
| VAD180L025S08-S-M10 | 11.7 | 18 | 25 | 20 | 15 | S08 | M10 | 11 |
| VAD210L020S08-S-M12 | 11.7 | 21 | 20 | 20 | 10 | S08 | M12 | 12.75 |
| VAD210L025S08-S-M12 | 11.7 | 21 | 25 | 20 | 13 | S08 | M12 | 12.75 |

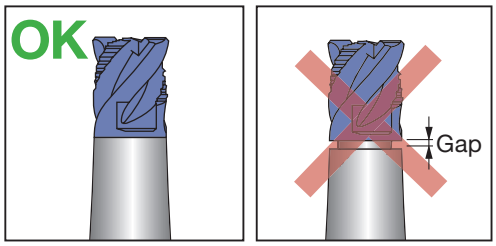
## WRENCH

| Appearance | Designation | Connection screw size | Torque (N·m) | Applicable head |
|---|---|---|---|---|
|  | KEYV-S05 | S05 | 7 | Square<br>Ball<br>Radius<br>Drilling<br>Chamfering<br>Counter boring |
| | KEYV-S06 | S06 | 10 | |
| | KEYV-S08 | S08 | 15 | |
| | KEYV-S10 | S10 | 28 | |
| | KEYV-S12 | S12 | 28 | |
| | KEYV-W20 | S15 | 40 | |
|  | KEYV-177 | S06 | 10 | Slotting VST type |
| | KEYV-217 | S08 | 15 | |
|  | KEYV-T40L | S08 | 15 | Slotting VST, VTB type |
| | | S10 | 28 | |
| | KEYV-T20 | S05 | 7 | Slotting VTB type |
| | | S06 | 10 | |
| | KEYV-T25 | S06 | 10 | |
| | KEYV-T30L | S08 | 15 | |
| | KEYV-T50L | S08 | 15 | |
| | | S10 | 28 | |

Note: Optional parts

## CAUTIONARY POINTS IN USE

· The cutting heads specified by Tungaloy must be used. Avoid using alternate heads that are not Tungaloy products as this will damage the shank and can cause severe accident or injury.
· Before setting the head, clean the connection screw with an air blast or a wiping cloth to remove chips and other foreign matter that may remain.
· Do not apply the lubricant to the connection screw.
· Please use the correct “Wrench” with the correct cutting head. Tighten the head slowly until the face of the head contacts the shank. (Please refer to the picture shown on the right.) Re-tightening or over-tightening is not required. Excessive tightening may cause the cutting head to break.
· Do not apply excessive force or a hammer when tightening or exchanging the cutting heads.



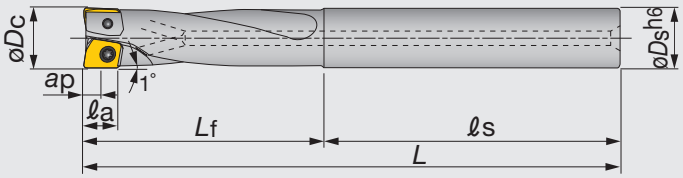
MEMO

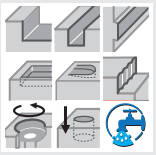
# HYBRIDTACMILL
## EVH

Multi purpose endmills with center edge in small diameter

A.R. = +20, R.R. = +12





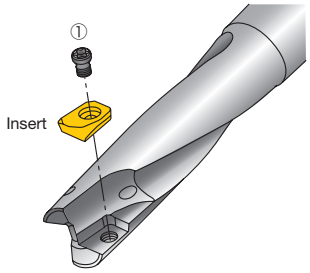



Right hand (R) shown.

| Designation | Max. *ap* | ø*D*c | z | ø*D*s | ℓs | *L*f | ℓa | *L* | Insert |
|---|---|---|---|---|---|---|---|---|---|
| EVH06R010M10.0-02 | 3 | 10 | 2 | 10 | 50 | 40 | 5 | 90 | XVGT06H20... |
| EVH07R012M12.0-02 | 3.5 | 12 | 2 | 12 | 50 | 48 | 6 | 98 | XVGT07X30... |
| EVH09R016M16.0-02 | 4.5 | 16 | 2 | 16 | 60 | 64 | 8 | 124 | XVGT09X40... |

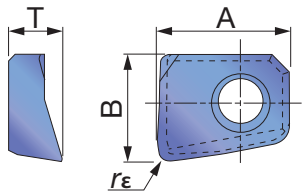
### SPARE PARTS

| Designation | ① Clamping screw | Lubricant | Wrench | Wrench 1 |
|---|---|---|---|---|
| EVH06R010M10.0-02 | CSPD-1.8S | M-1000 | - | IP-6F |
| EVH07R012M12.0-02 | CSPB-2H | M-1000 | - | IP-6F |
| EVH09R016M16.0-02 | CSPB-2.5S | M-1000 | IP-8D | - |

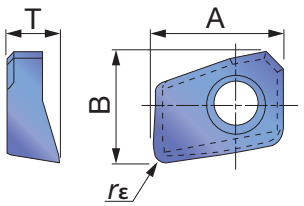


## INSERT

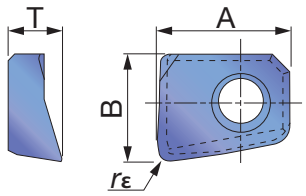
### XVGT EC-MJ (Central)



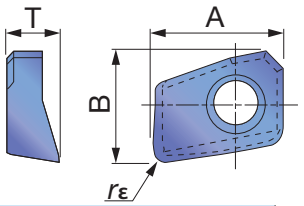

### XVGT EP-MJ (Peripheral)




### XVGT FC-AJ (Central)




### XVGT FP-AJ (Peripheral)




| | | AH730 | DS1200 |
|---|---|---|---|
| P | Steel | ★ | |
| M | Stainless | ★ | |
| K | Cast iron | ★ | |
| N | Non-ferrous | | ★ |
| S | Superalloys | | |
| H | Hard materials | | |

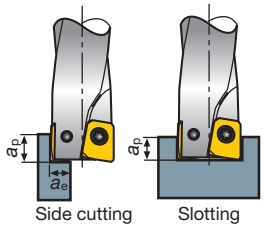
★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | Coating AH730 | Coating DS1200 | A | B | T |
|---|---|---|---|---|---|---|---|
| XVGT06H205EC-MJ | 0.5 | 3 | ● | | 6.2 | 5 | 2.5 |
| XVGT07X305EC-MJ | 0.5 | 3.5 | ● | | 7.1 | 6.1 | 3 |
| XVGT09X405EC-MJ | 0.5 | 4.5 | ● | | 9 | 8.2 | 4 |
| XVGT06H205EP-MJ | 0.5 | 3 | ● | | 6.2 | 5.3 | 2.5 |
| XVGT07X305EP-MJ | 0.5 | 3.5 | ● | | 7.1 | 6.4 | 3 |
| XVGT09X405EP-MJ | 0.5 | 4.5 | ● | | 9 | 8.2 | 4 |
| XVGT06H205FC-AJ | 0.5 | 3 | | ● | 6.2 | 5 | 2.5 |
| XVGT07X305FC-AJ | 0.5 | 3.5 | | ● | 7.1 | 6.1 | 3 |
| XVGT09X405FC-AJ | 0.5 | 4.5 | | ● | 9 | 8.2 | 4 |
| XVGT06H205FP-AJ | 0.5 | 3 | | ● | 6.2 | 5.3 | 2.5 |
| XVGT07X305FP-AJ | 0.5 | 3.5 | | ● | 7.1 | 6.4 | 3 |
| XVGT09X405FP-AJ | 0.5 | 4.5 | | ● | 9 | 8.2 | 4 |

●: Line-up

# STANDARD CUTTING CONDITIONS

●Shoulder milling, Slotting

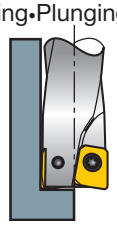



Side cutting Slotting

$a_p$: Axial depth of cut
$a_e$: Radial depth of cut

| Workpiece material | | Carbon steels and alloy steels | | Alloy steels and prehardened steelst | | Stainless steels | | Cast irons | | Aluminium alloys (Si < 13%) | | Aluminium alloys (Si ≥ 13%) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | | < 30HRC | | 30 ~ 40HRC | | < 250HB | | – | | – | | – | |
| Cutting speed | | $V_c$ = 50 ~ 120 m/min | | $V_c$ = 30 ~ 100 m/min | | $V_c$ = 50 ~ 120 m/min | | $V_c$ = 60 ~ 140 m/min | | $V_c$ = 100 ~ 300 m/min | | $V_c$ = 100 ~ 200 m/min | |
| Conditions | | No. of rev. $n$ min$^{-1}$ | Feed speed $V_f$ mm/min | No. of rev. $n$ min$^{-1}$ | Feed speed $V_f$ mm/min | No. of rev. $n$ min$^{-1}$ | Feed speed $V_f$ mm/min | No. of rev. $n$ min$^{-1}$ | Feed speed $V_f$ mm/min | No. of rev. $n$ min$^{-1}$ | Feed speed $V_f$ mm/min | No. of rev. $n$ min$^{-1}$ | Feed speed $V_f$ mm/min |
| Tool dia. (mm) | ø10 | 2550 | 380 | 1910 | 190 | 2550 | 380 | 3180 | 510 | 6370 | 1020 | 4770 | 670 |
| | ø12 | 2120 | 320 | 1590 | 160 | 2120 | 320 | 2650 | 420 | 5300 | 850 | 3980 | 560 |
| | ø16 | 1590 | 240 | 1190 | 120 | 1590 | 240 | 1990 | 320 | 3980 | 640 | 2980 | 420 |
| Depth of cut | Side cutting | $a_p$ < 0.25D $a_e$ < 0.2D | | $a_p$ < 0.25D $a_e$ < 0.2D | | $a_p$ < 0.25D $a_e$ < 0.2D | | $a_p$ < 0.25D $a_e$ < 0.3D | | $a_p$ < 0.25D $a_e$ < 0.3D | | $a_p$ < 0.25D $a_e$ < 0.3D | |
| | Slotting | $a_p$ < 0.1D | | $a_p$ < 0.1D | | $a_p$ < 0.1D | | $a_p$ < 0.15D | | $a_p$ < 0.2D | | $a_p$ < 0.2D | |

●Drilling•Plunging

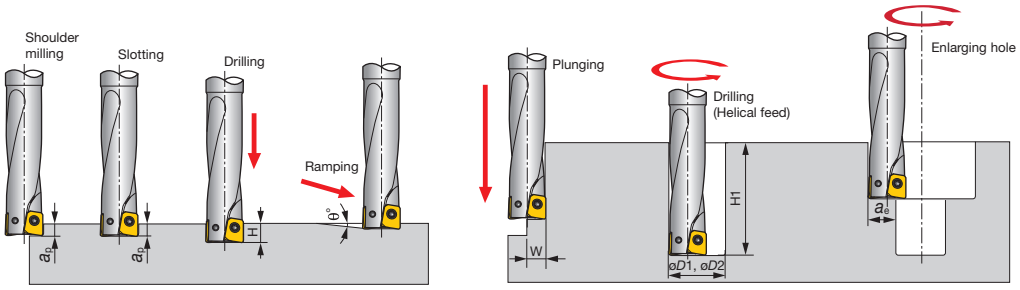


| Workpiece material | | Carbon steels and alloy steels | | Alloy steels and prehardened steelst | | Stainless steels | | Cast irons | | Aluminium alloys (Si < 13%) | | Aluminium alloys (Si ≥ 13%) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | | < 30HRC | | 30 ~ 40HRC | | < 250HB | | – | | – | | – | |
| Cutting speed | | $V_c$ = 50 ~ 120 m/min | | $V_c$ = 30 ~ 100 m/min | | $V_c$ = 50 ~ 120 m/min | | $V_c$ = 60 ~ 140 m/min | | $V_c$ = 100 ~ 300 m/min | | $V_c$ = 100 ~ 300 m/min | |
| Conditions | | No. of rev. $n$ min$^{-1}$ | Feed speed $V_f$ mm/min | No. of rev. $n$ min$^{-1}$ | Feed speed $V_f$ mm/min | No. of rev. $n$ min$^{-1}$ | Feed speed $V_f$ mm/min | No. of rev. $n$ min$^{-1}$ | Feed speed $V_f$ mm/min | No. of rev. $n$ min$^{-1}$ | Feed speed $V_f$ mm/min | No. of rev. $n$ min$^{-1}$ | Feed speed $V_f$ mm/min |
| Tool dia. (mm) | ø10 | 2550 | 130 | 1910 | 80 | 2550 | 130 | 3180 | 190 | 6370 | 450 | 4770 | 290 |
| | ø12 | 2120 | 110 | 1590 | 65 | 2120 | 110 | 2650 | 160 | 5300 | 370 | 3980 | 240 |
| | ø16 | 1590 | 80 | 1190 | 50 | 1590 | 80 | 1990 | 120 | 3980 | 280 | 2980 | 180 |

Note:

- In slotting or pocketing where chips tend to stay in the cutting zone, use an air blast to remove chips to prevent chip recutting.
- When chips tend to weld excessively on the cutting edge such as in machining aluminium alloys, use a water soluble cutting fluid.
- In the case of cutting a casting skin or a heavily interrupted work surface, decrease the feed per tooth and the maximum depth of cut to 1/2 to 2/3 times the values shown in the table.
- Tool overhang length must be as short as possible to avoid chatter. When the tool overhang length is long, decrease the number of revolutions and feed.
- Cutting conditions are generally limited by the rigidity and power of the machine and the rigidity of the workpiece. When setting the conditions, start from half of the values of the standard cutting conditions and then increase the value gradually whilst making sure that the machine is running normally.

# APPLICATION RANGE




| Designation | Tool dia. | Max. depth of cut ap (mm) | Max.drilling depth H (mm) | Max.cutting width in plunging W (mm) | Max. ramping angle θ° | Min. machinable hole dia. øD1(mm) | Min. machinable hole dia. øD2 (mm) | Max. cutting width in enlarging hole ae (mm) | Max.depth of boring H1 (mm) |
|---|---|---|---|---|---|---|---|---|---|
| EVH06R010M10.0-02 | ø10 | 3 | 5 | 5 | 5 | 12 | 19 | 9 | 30 |
| EVH07R012M12.0-02 | ø12 | 3.5 | 6 | 6 | 5 | 14 | 23 | 11 | 36 |
| EVH09R016M16.0-02 | ø16 | 4.5 | 8 | 8 | 5 | 18 | 31 | 15 | 48 |

## EVX

### Multi purpose endmills with center edge in medium diameter

Standard type A.R. = +2˚~ +5˚, R.R. = -10˚~ -3.5˚
Long type A.R. = +5˚, R.R. = -4˚~ -2˚



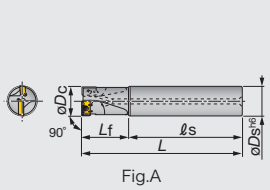


Fig.A

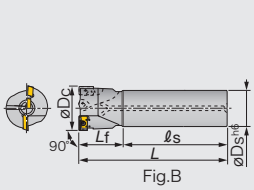


Fig.B

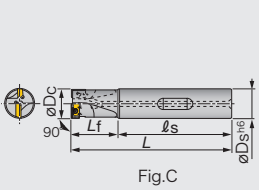
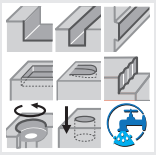


Fig.C



| Designation | Max. *ap* | *øDc* | z | *øDs* | *ℓs* | *Lf* | *L* | Air hole | Fig. | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| EVX08016RSA-E | 7 | 16 | 2 | 16 | 55 | 30 | 85 | with | C | XXMU08... |
| EVX08016RLA-E | 7 | 16 | 2 | 16 | 55 | 50 | 105 | with | C | XXMU08... |
| EVX08016RSA | 7 | 16 | 2 | 16 | 90 | 30 | 120 | with | A | XXMU08... |
| EVX08016RS | 7 | 16 | 2 | 16 | 90 | 30 | 120 | without | A | XXMU08... |
| EVX08016RLA | 7 | 16 | 2 | 16 | 135 | 40 | 175 | with | A | XXMU08... |
| EVX08016RL | 7 | 16 | 2 | 16 | 135 | 40 | 175 | without | A | XXMU08... |
| EVX10020RSA-E | 9 | 20 | 2 | 20 | 60 | 30 | 90 | with | C | XXMU10... |
| EVX10020RSA | 9 | 20 | 2 | 20 | 90 | 30 | 120 | with | A | XXMU10... |
| EVX10020RS | 9 | 20 | 2 | 20 | 90 | 30 | 120 | without | A | XXMU10... |
| EVX10020RLA-E | 9 | 20 | 2 | 20 | 60 | 60 | 120 | with | C | XXMU10... |
| EVX10020RLA | 9 | 20 | 2 | 20 | 135 | 50 | 185 | with | A | XXMU10... |
| EVX10020RL | 9 | 20 | 2 | 20 | 135 | 50 | 185 | without | A | XXMU10... |
| EVX12025RSA-E | 11.5 | 25 | 2 | 25 | 60 | 40 | 100 | with | C | XXMU12... |
| EVX12025RLA-E | 11.5 | 25 | 2 | 25 | 60 | 75 | 135 | with | C | XXMU12... |
| EVX12025RSA | 11.5 | 25 | 2 | 25 | 100 | 40 | 140 | with | A | XXMU12... |
| EVX12025RS | 11.5 | 25 | 2 | 25 | 100 | 40 | 140 | without | A | XXMU12... |
| EVX12025RLA | 11.5 | 25 | 2 | 25 | 150 | 70 | 220 | with | A | XXMU12... |
| EVX12025RL | 11.5 | 25 | 2 | 25 | 150 | 70 | 220 | without | A | XXMU16 |
| EVX16032RSA-E | 15 | 32 | 2 | 25 | 60 | 50 | 110 | with | C | XXMU16... |
| EVX16032RLA-E | 15 | 32 | 2 | 25 | 60 | 95 | 155 | with | C | XXMU16... |
| EVX16032RSA | 15 | 32 | 2 | 32 | 110 | 50 | 160 | with | A | XXMU16... |
| EVX16032RS | 15 | 32 | 2 | 32 | 110 | 50 | 160 | without | A | XXMU16... |
| EVX16032RLA | 15 | 32 | 2 | 32 | 175 | 80 | 255 | with | A | XXMU16... |
| EVX16032RL | 15 | 32 | 2 | 32 | 175 | 80 | 255 | without | A | XXMU16... |
| EVX12040RSA | 11.5 | 40 | 2 | 42 | 120 | 60 | 180 | with | B | XXMU12, WCMT05... |
| EVX12040RS | 11.5 | 40 | 2 | 42 | 120 | 60 | 180 | without | B | XXMU12, WCMT05... |
| EVX12040RLA | 11.5 | 40 | 2 | 42 | 210 | 100 | 310 | with | B | XXMU12, WCMT05... |
| EVX12040RL | 11.5 | 40 | 2 | 42 | 210 | 100 | 310 | without | B | XXMU12, WCMT05... |
| EVX16050RSA | 15 | 50 | 2 | 42 | 160 | 50 | 210 | with | B | XXMU16, WCMT06... |
| EVX16050RS | 15 | 50 | 2 | 42 | 160 | 50 | 210 | without | B | XXMU16, WCMT06... |
| EVX16050RLA | 15 | 50 | 2 | 42 | 310 | 50 | 360 | with | B | XXMU16, WCMT06... |
| EVX16050RL | 15 | 50 | 2 | 42 | 310 | 50 | 360 | without | B | XXMU16, WCMT06... |
| EVX16063RSA | 15 | 63 | 2 | 42 | 190 | 50 | 240 | with | B | XXMU16, WCMT06... |
| EVX16063RS | 15 | 63 | 2 | 42 | 190 | 50 | 240 | without | B | XXMU16, WCMT06... |
| EVX16063RLA | 15 | 63 | 2 | 42 | 310 | 50 | 360 | with | B | XXMU16, WCMT06... |
| EVX16063RL | 15 | 63 | 2 | 42 | 310 | 50 | 360 | without | B | XXMU16, WCMT06... |

### SPARE PARTS



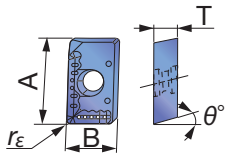




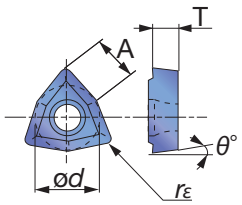
| Designation | Clamping screw | Clamping screw 1 | Lubricant | Wrench | Wrench 1 |
|---|---|---|---|---|---|
| EVX08016R... | - | CSPB-2.2 | M-1000 | IP-7D | - |
| EVX10020R... | - | CSPB-2.5 | M-1000 | IP-8D | - |
| EVX12025R... | - | CSPD-3 | M-1000 | IP-10D | - |
| EVX16032R... | CSPB-3.5 | - | M-1000 | IP-15D | - |
| EVX12040R... | - | CSPD-3 | M-1000 | IP-10D | - |
| EVX16050, 63R... | CSPB-3.5 | CSTB-3.5D | M-1000 | IP-15D | T-9D |

## INSERT

### XXMU-MJ




### WCMT-D4




| | | | | |
|---|---|---|---|---|
| P | Steel | ★ | | |
| M | Stainless | | ★ | |
| K | Cast iron | ★ | | |
| N | Non-ferrous | | | |
| S | Superalloys | | | |
| H | Hard materials | | | |

★ : First choice
☆ : Second choice

| Designation | rε | Coating | | A | ød | T | θ° | B |
|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH140 | | | | | |
| XXMU08T204PR-MJ | 0.4 | ● | ● | 8.2 | - | 2.78 | 10 | 5.6 |
| XXMU10H308PR-MJ | 0.8 | ● | ● | 10.6 | - | 3.5 | 11 | 6.8 |
| XXMU12X408PR-MJ | 0.8 | ● | ● | 13.2 | - | 4.2 | 11 | 7.9 |
| XXMU16X508PR-MJ | 0.8 | ● | ● | 16.8 | - | 5 | 11 | 11.1 |
| WCMT050308-D4 | 0.8 | ● | ● | 5.4 | 7.94 | 3.18 | 7 | - |
| WCMT06T308-D4 | 0.8 | ● | ● | 6.5 | 9.525 | 3.97 | 7 | - |

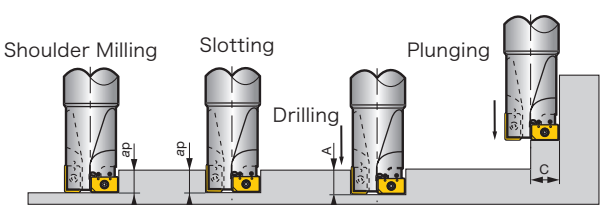
●: Line-up

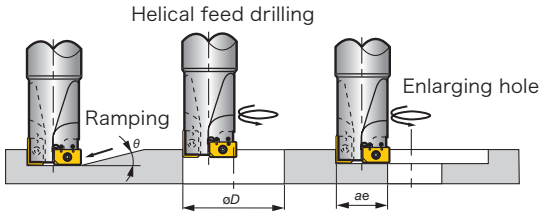


## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Grade | øD: ø16 ~ ø20 mm | | | øD: ø25 ~ ø63 mm | | |
|---|---|---|---|---|---|---|---|---|
| | | | Cutting speed Vc (m/min) | Feed per tooth fz (mm/t) | | Cutting speed Vc (m/min) | Feed per tooth fz (mm/t) | |
| | | | | Shouldering·Grooving | Drilling | | Shouldering·Grooving | Drilling |
| P | Carbon steels C55, etc. < 300 HB | AH120 | 100 ~ 180 | 0.05 ~ 0.2 | 0.03 ~ 0.08 | 120 ~ 200 | 0.08 ~ 0.25 | 0.05 ~ 0.1 |
| P | Alloy steels 42CrMo4, etc. < 300 HB | AH120 | 80 ~ 160 | 0.05 ~ 0.15 | 0.03 ~ 0.08 | 100 ~ 180 | 0.08 ~ 0.2 | 0.05 ~ 0.1 |
| P | Die steels X96CrMoV12, etc. < 300 HB | AH120 | 60 ~ 120 | 0.05 ~ 0.13 | 0.03 ~ 0.06 | 80 ~ 150 | 0.08 ~ 0.15 | 0.03 ~ 0.08 |
| M | Stainless steels X5CrNi18 9, etc. | AH140 | 70 ~ 140 | 0.05 ~ 0.15 | 0.03 ~ 0.08 | 90 ~ 160 | 0.08 ~ 0.2 | 0.03 ~ 0.08 |
| K | Cast irons 250, etc. | AH120 | 100 ~ 180 | 0.05 ~ 0.25 | 0.03 ~ 0.1 | 120 ~ 200 | 0.08 ~ 0.25 | 0.05 ~ 0.1 |

## APPLICATION RANGE



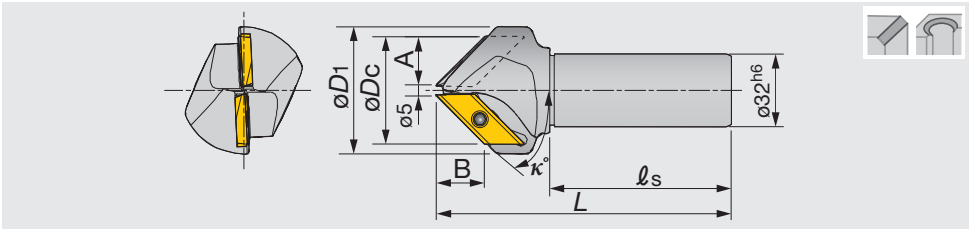




| | Designation | Tool diameter ø*D*c | Max. depth of cut (*a*p) | Max. drilling depth (A) | Max. cutting width in plunging (C) | Max. ramping angle (D) | Min. machining hole dia. (ø*D*min) | Max. machining hole dia. (ø*D*max) | Max. cutting width in enlarging hole (*a*e) |
|---|---|---|---|---|---|---|---|---|---|
| Standard type / Long type | EVX08016R... | 16 | 7 | 8 | 8 | 3° | 19.2 | 30 | 14 |
| | EVX10020R... | 20 | 9 | 10 | 10 | 3° | 24 | 38 | 18 |
| | EVX12025R... | 25 | 11.5 | 12.5 | 12.5 | 3° | 30 | 48 | 23 |
| | EVX16032R... | 32 | 15 | 16 | 16 | 3° | 38.4 | 62 | 30 |
| | EVX12040RS/L (A) | 40 | 11.5 | 20 | 20 | 3° | 48 | 78 | 38 |
| | EVX16050RS/L (A) | 50 | 15 | 25 | 25 | 3° | 60 | 98 | 48 |
| | EVX16063RS/L (A) | 63 | 15 | 31.5 | 31.5 | 3° | 75.6 | 124 | 61 |

## ECC31

Indexable chamfering cutter with large parallelogram insert






| Designation | øDc | z | κ° | øD1 | A | B | øDs | ℓs | L | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| ECC31005R-30 | 34 | 1 | 30 | 40 | 14.5 | 25.5 | 32 | 80 | 130.2 | XCET3104... |
| ECC31005R-45 | 46 | 2 | 45 | 56 | 20.5 | 20.5 | 32 | 80 | 130.1 | XCET3104... |
| ECC31005R-60 | 55 | 2 | 60 | 72 | 25.5 | 14.5 | 32 | 80 | 130.1 | XCET3104... |

### SPARE PARTS

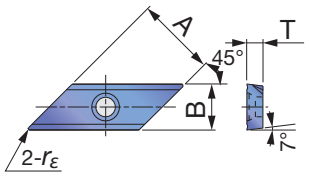




| Designation | Clamping screw | Lubricant | Wrench |
|---|---|---|---|
| ECC31... | CSTB-5S | M-1000 | T-20D |

## INSERT

### XCET31




| | | Coating | Cermet | Un-coated |
|---|---|---|---|---|
| P | Steel | ☆ | ★ | ☆ |
| M | Stainless | ★ | | |
| K | Cast iron | ★ | | |
| N | Non-ferrous | | | |
| S | Superalloys | | | |
| H | Hard meterials | | | |

★ : First choice
☆ : Second choice

| Designation | rε | AH330 | NS740 | UX30 | A | B | T |
|---|---|---|---|---|---|---|---|
| XCET310404ER | 0.4 | ● | ● | ● | 22 | 12.7 | 4.5 |

●: Line-up

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Grade | No. of revolutions: *n* (min$^{-1}$) | Feed per tooth: *fz* (mm/t) |
|---|---|---|---|---|
| P | Carbon steels C55, etc.<br>Alloy steels 42CrMo4, etc. < 300 HB | NS740 | 1000 - 3000 - 7000 | 0.1 - 0.25 |
| | | UX30 | 700 - 2000 - 4900 | 0.1 - 0.25 |
| | Die steels<br>X40CrMoV5-1, etc. < 300 HB | AH330 | 1000 - 3000 - 7000 | 0.1 - 0.2 |
| M | Stainless steels<br>X5CrNi18-10, etc. < 250 HB | AH330 | 1000 - 3000 - 7000 | 0.1 - 0.25 |
| K | Cast irons 250, etc. | AH330 | 1000 - 3000 - 7000 | 0.1 - 0.25 |

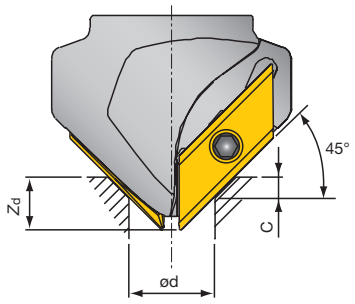
Notes:

- When the hole diameter to be chamfered is small or the cutting edges near the front end of tool are used, use at higher side of the revolution range shown in the Table.
  In contrast, when the hole diameter to be chamfered is large or the cutting edges far from the tool's front end are used, use the lower side of the revolution range shown in the Table.
- When chamfering a small diameter hole (smaller than ø10 mm) in a plunge-milling mode, peck-feeding should not be used.
- When the hole diameter to be chamfered is smaller than ø10 mm or the cutting edges near the tool's front end are used, the feed should be set within 0.15 mm/t.

## Guidelines for programming

Z-axis plunging depth $Z_d$ (mm) in 45° chamfering of hole

| Hole dia. ød (mm) | Size of chamfering C (mm) | | | | | | |
|---|---|---|---|---|---|---|---|
| | 0.5 | 1 | 1.5 | 2 | 3 | 4 | 5 |
| 5 | 0.7 | 1.2 | 1.7 | 2.2 | 3.2 | - | - |
| 6 | 1.2 | 1.7 | 2.2 | 2.7 | 3.7 | - | - |
| 6.8 | 1.6 | 2.1 | 2.6 | 3.1 | 4.1 | - | - |
| 8 | 2.2 | 2.7 | 3.2 | 3.7 | 4.7 | - | - |
| 8.5 | 2.4 | 2.9 | 3.4 | 3.9 | 4.9 | - | - |
| 10 | 3.2 | 3.7 | 4.2 | 4.7 | 5.7 | 6.7 | 7.7 |
| 10.2 | 3.3 | 3.8 | 4.3 | 4.8 | 5.8 | 6.8 | 7.8 |
| 12 | 4.2 | 4.7 | 5.2 | 5.7 | 6.7 | 7.7 | 8.7 |
| 14 | 5.2 | 5.7 | 6.2 | 6.7 | 7.7 | 8.7 | 9.7 |
| 16 | 6.2 | 6.7 | 7.2 | 7.7 | 8.7 | 9.7 | 10.7 |
| 17.5 | 6.9 | 7.4 | 7.9 | 8.4 | 9.4 | 10.4 | 11.4 |
| 20 | 8.2 | 8.7 | 9.2 | 9.7 | 10.7 | 11.7 | 12.7 |
| 21 | 8.7 | 9.2 | 9.7 | 10.2 | 11.2 | 12.2 | 13.2 |
| 24 | 10.2 | 10.7 | 11.2 | 11.7 | 12.7 | 13.7 | 14.7 |
| 30 | 13.2 | 13.7 | 14.2 | 14.7 | 15.7 | 16.7 | 17.7 |
| 33 | 14.7 | 15.2 | 15.7 | 16.2 | 17.2 | 18.2 | 19.2 |
| 36 | 16.2 | 16.7 | 17.2 | 17.7 | 18.7 | 19.7 | - |
| 42 | 19.2 | 19.7 | 20.2 | - | - | - | - |

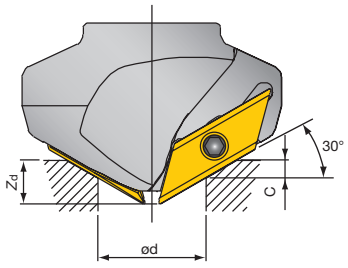



**Tool: ECC31005R-45**

Note: When the hole depth is smaller than the Z-axis plunging depth (Zd), special care should be taken to avoid an interference between the tool's front end and the bottom of the hole.

Z-axis plunging depth $Z_d$ (mm) in 30° chamfering of hole

| Hole dia. ød (mm) | Size of chamfering C (mm) | | | | | | |
|---|---|---|---|---|---|---|---|
| | 0.5 | 1 | 1.5 | 2 | 2.5 | 3 | 3.5 |
| 5 | 0.6 | 1.1 | 1.6 | 2.1 | - | - | - |
| 6 | 0.9 | 1.4 | 1.9 | 2.4 | - | - | - |
| 6.8 | 1.1 | 1.6 | 2.1 | 2.6 | - | - | - |
| 8 | 1.4 | 1.9 | 2.4 | 2.9 | - | - | - |
| 8.5 | 1.6 | 2.1 | 2.6 | 3.1 | - | - | - |
| 10 | 2 | 2.5 | 3 | 3.5 | 4 | 4.5 | 5 |
| 10.2 | 2.1 | 2.6 | 3.1 | 3.6 | 4.1 | 4.6 | 5.1 |
| 12 | 2.6 | 3.1 | 3.6 | 4.1 | 4.6 | 5.1 | 5.6 |
| 16 | 3.7 | 4.2 | 4.7 | 5.2 | 5.7 | 6.2 | 6.7 |
| 17.5 | 4.2 | 4.7 | 5.2 | 5.7 | 6.2 | 6.7 | 7.2 |
| 20 | 4.9 | 5.4 | 5.9 | 6.4 | 6.9 | 7.4 | 7.9 |
| 21 | 5.2 | 5.7 | 6.2 | 6.7 | 7.2 | 7.7 | 8.2 |
| 24 | 6.1 | 6.6 | 7.1 | 7.6 | 8.1 | 8.6 | 9.1 |
| 30 | 7.8 | 8.3 | 8.8 | 9.3 | 9.8 | 10.3 | 10.8 |
| 33 | 8.7 | 9.2 | 9.7 | 10.2 | 10.7 | 11.2 | 11.7 |
| 36 | 9.5 | 10 | 10.5 | 11 | 11.5 | 12 | 12.5 |
| 38 | 10.1 | 10.6 | 11.1 | 11.6 | 12.1 | 12.6 | 13.1 |
| 42 | 11.2 | 11.7 | 12.2 | 12.7 | 13.2 | 13.7 | 14.2 |
| 46 | 12.4 | 12.9 | 13.4 | 13.9 | 14.4 | - | - |
| 48 | 13 | 13.5 | 14 | 14.5 | - | - | - |
| 52 | 14.1 | - | - | - | - | - | - |

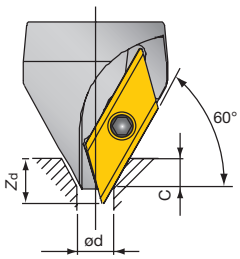



**Tool: ECC31005R-60**

Note: When the hole depth is smaller than the Z-axis plunging depth (Zd), special care should be taken to avoid an interference between the tool's front end and the bottom of the hole.

Z-axis plunging depth $Z_d$ (mm) in 60° chamfering of hole

| Hole dia. ød (mm) | Size of chamfering C (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 0.5 | 1 | 1.5 | 2 | 2.5 | 3 | 3.5 | 4 |
| 5 | 0.8 | 1.3 | 1.8 | 2.3 | 2.8 | - | - | - |
| 6 | 1.7 | 2.2 | 2.7 | 3.2 | 3.7 | - | - | - |
| 6.8 | 2.4 | 2.9 | 3.4 | 3.9 | 4.4 | - | - | - |
| 8 | 3.4 | 3.9 | 4.4 | 4.9 | 5.4 | - | - | - |
| 8.5 | 3.8 | 4.3 | 4.8 | 5.3 | 5.8 | - | - | - |
| 10 | 5.1 | 5.6 | 6.1 | 6.6 | 7.1 | 7.6 | 8.1 | 8.6 |
| 10.2 | 5.3 | 5.8 | 6.3 | 6.8 | 7.3 | 7.8 | 8.3 | 8.8 |
| 12 | 6.9 | 7.4 | 7.9 | 8.4 | 8.9 | 9.4 | 9.9 | 10.4 |
| 16 | 10.3 | 10.8 | 11.3 | 11.8 | 12.3 | 12.8 | 13.3 | 13.8 |
| 17.5 | 11.6 | 12.1 | 12.6 | 13.1 | 13.6 | 14.1 | 14.6 | 15.1 |
| 20 | 13.7 | 14.2 | 14.7 | 15.2 | 15.7 | 16.2 | 16.7 | 17.2 |
| 21 | 14.6 | 15.1 | 15.6 | 16.1 | 16.6 | 17.1 | 17.6 | 18.1 |
| 24 | 17.2 | 17.7 | 18.2 | 18.7 | 19.2 | 19.7 | 20.2 | 20.7 |
| 30 | 22.4 | 22.9 | 23.4 | 23.9 | 24.4 | 24.9 | 25.4 | - |
| 33 | 24.9 | 25.4 | - | - | - | - | - | - |



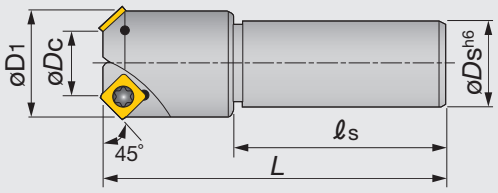

**Tool: ECC31005R-30**

Note: When the hole depth is smaller than the Z-axis plunging depth (Zd), special care should be taken to avoid an interference between the tool's front end and the bottom of the hole.

## ECP4400R

Indexable chamfering cutter with square insert





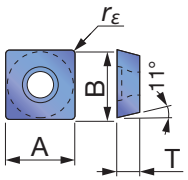

| Designation | øDc | z | øD1 | øDs | L | ℓs | Insert |
|---|---|---|---|---|---|---|---|
| ECP440AR | 10 | 1 | 27.5 | 32 | 130 | 80 | SPMA422*N |
| ECP4423R | 23 | 2 | 40.3 | 32 | 130 | 80 | SPMA422*N |
| ECP4436R | 36 | 3 | 53.3 | 32 | 130 | 80 | SPMA422*N |

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| ECP44... | CSTA-4 | T-15D |

## INSERT

### SPMA42



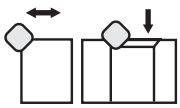
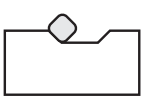

| | | Cermet | | | Uncoated | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ★ | ☆ | | ☆ | | | | | | | | | | | | | | |
| M | Stainless | | | | | | | | | | | | | | | | | | |
| K | Cast iron | | | | | ★ | | | | | | | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | |
| S | Superalloys | | | | | | | | | | | | | | | | | | |
| H | Hard meterials | | | | | | | | | | | | | | | | | | |

★ : First choice
☆ : Second choice

| Designation | rε | NS740 | N308 | UX30 | TH10 | A | B | T |
|---|---|---|---|---|---|---|---|---|
| SPMA422TN | 0.8 | ● | ● | ● | | 12.7 | 12.7 | 3.18 |
| SPMA422FN | 0.8 | | | | ● | 12.7 | 12.7 | 3.18 |

●: Line-up

## STANDARD CUTTING CONDITIONS

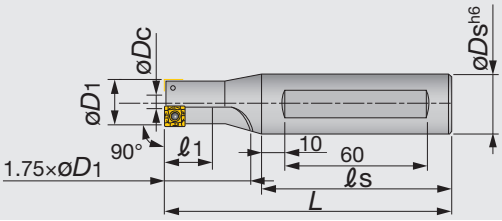
| Operations | | Workpiece material | Grade | Cutting speed Vc (m/min) | Maximum depth of cut ap (mm) | Feed per tooth fz (mm/t) |
|---|---|---|---|---|---|---|
| Single or double chamfering hole chamfering  | P | Carbon steels, Alloy steels < 300HB | NS740 · N308 UX30 | 100 - 150 | - | 0.2 - 0.5 |
| | P | Die steels < 30HRC | NS740 · N308 UX30 | 50 - 70 | - | 0.15 - 0.4 |
| | K | Cast irons | TH10 | 90 - 110 | - | 0.2 - 0.6 |
| Facing Grooving  | P | Carbon steels, Alloy steels < 300HB | NS740 · N308 UX30 | 100 - 150 | 3 | 0.1 - 0.15 |
| | P | Die steels < 30HRC | UX30 | 50 - 70 | 2 | 0.1 - 0.15 |
| | K | Cast irons | TH10 | 90 - 110 | 3 | 0.1 - 0.15 |

Notes:
- When chamfering stainless steel, down-milling is recommended. Conventional milling may cause edge chipping.
- When chamfering above C3.0, the feed per tooth should be set up the lower side of the value shown in the above table.

## TCB

Indexable counter boring endmill






| Designation | øDc | z | øD1 | ℓ1 | L | ℓs | øDs | Insert |
|---|---|---|---|---|---|---|---|---|
| TCB-140 | 4 | 1 | 14 | 18 | 117 | 80 | 25 | SPMP831DS |
| TCB-175 | 7.1 | 2 | 17.5 | 22 | 115 | 80 | 25 | SPMP831DS |
| TCB-200 | 8.2 | 2 | 20 | 25 | 120 | 80 | 25 | SPMP042ERD |
| TCB-230 | 11 | 2 | 23 | 29 | 126 | 80 | 25 | SPMP042ERD |
| TCB-260 | 14 | 2 | 26 | 33 | 132 | 80 | 32 | SPMP042ERD |
| TCB-290 | 14 | 2 | 29 | 30 | 138 | 80 | 32 | SPMM322ERD |
| TCB-320 | 16.9 | 2 | 32 | - | 144 | 80 | 32 | SPMM322ERD |
| TCB-350 | 14 | 2 | 35 | - | 150 | 80 | 32 | SPMM432ERD |
| TCB-390 | 17.9 | 2 | 39 | - | 158 | 80 | 32 | SPMM432ERD |
| TCB-430 | 21.7 | 2 | 43 | - | 171 | 85 | 42 | SPMM432ERD |

### SPARE PARTS

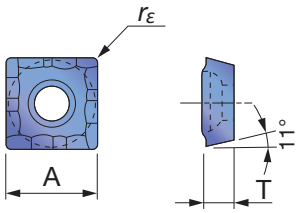




| Designation | Clamping screw | Wrench |
|---|---|---|
| TCB-140 | CSTB-2.2S | T-7D |
| TCB-175 | CSTB-2.2 | T-7D |
| TCB-200 - 260 | CSTA-NO3 | T-9D |
| TCB-290, 320 | CSTA-NO5 | T-9D |
| TCB-350 - 430 | CSTA-4 | T-15D |

## INSERT

### SPMP/SPMM




| | | | |
|---|---|---|---|
| P | Steel | ★ | |
| M | Stainless | ★ | |
| K | Cast iron | ★ | |
| N | Non-ferrous | | |
| S | Superalloys | | |
| H | Hard meterials | | |

★ : First choice
☆ : Second choice

| Designation | rε | Coating T313W | A | T |
|---|---|---|---|---|
| SPMP831DS | 0.4 | ● | 6.35 | 2.38 |
| SPMP042ERD | 0.8 | ● | 7.938 | 3.18 |
| SPMM322ERD | 0.8 | ● | 9.525 | 3.18 |
| SPMM432ERD | 0.8 | ● | 12.7 | 4.76 |

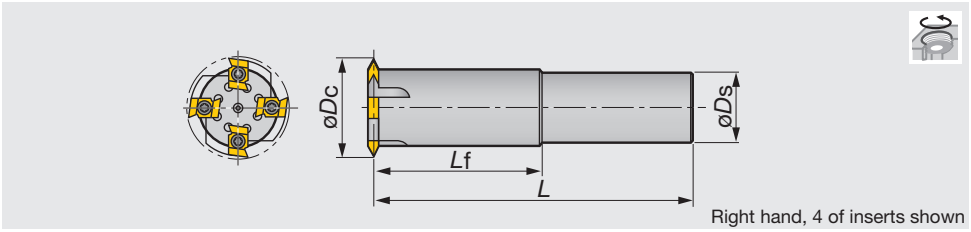
●: Line-up

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Grade | Cutting speed *Vc* (m/min) | Feed *f* (mm/rev) | Cutting fluid |
|---|---|---|---|---|---|
| P | Carbon steels | T313W | 80 - 150 | 0.12 - 0.24 | Water soluble type |
| M | Stainless steels, Mild steels | T313W | 150 - 200 | 0.05 - 0.12 | Water soluble type |
| K | Cast irons | T313W | 70 - 130 | 0.2 - 0.4 | Water soluble type or dry cutting |

Notes :
- For cutters under 20 mm diameter, be sure to use a cutting fluid and select lower cutting speeds than shown above.
- For TCB-140 type, reduce the feeds to 1/2 of the values shown in the table.





Right hand, 4 of inserts shown

| Designation | øDc | z | øDs | Lf | L | Range of internal thread | Insert |
|---|---|---|---|---|---|---|---|
| D23-D25-45R | 23 | 1 | 25 | 45 | 115 | M28 - M30 | T1-R... |
| D25-D25-45R | 25 | 1 | 25 | 45 | 115 | M32 - M42 | T1-R... |
| D38-D32-85R | 38 | 2 | 32 | 85 | 165 | M45 - M56 | T1-R... |
| D50-D42-100R | 50 | 4 | 42 | 100 | 190 | M58 - M68 | T1-R... |
| D55-D42-100R | 55 | 4 | 42 | 100 | 190 | M64 - M85 | T2-R... |
| D60-D42-100R | 60 | 4 | 42 | 100 | 190 | M70 - M85 | T2-R... |
| D80-D42-100R | 80 | 6 | 42 | 100 | 190 | M90 - | T2-R... |

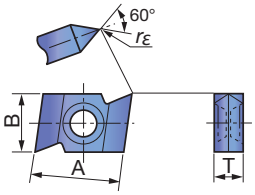
## SPARE PARTS




| Designation | Clamping screw | Wrench |
|---|---|---|
| D23-D25... - D50-D42... | CSTB-4 | T-15F |
| D55-D42... - D80-D42... | CSTB-5 | T-20F |

## INSERT

### T*-R...




| | | |
|---|---|---|
| P | Steel | ★ |
| M | Stainless | ★ |
| K | Cast iron | |
| N | Non-ferrous | |
| S | Superalloys | |
| H | Hard meterials | |

★ : First choice
☆ : Second choice

| Designation | rε | Coating GH330 | A | B | T |
|---|---|---|---|---|---|
| T1-R14 | 0.14 | ● | 14.4 | 9.525 | 4.76 |
| T1-R28 | 0.28 | ● | 14.4 | 9.525 | 4.76 |
| T2-R14 | 0.14 | ● | 17.8 | 12.7 | 6.35 |
| T2-R28 | 0.28 | ● | 17.8 | 12.7 | 6.35 |

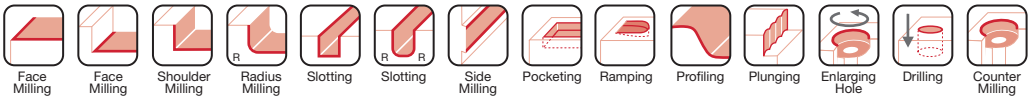
●: Line-up

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Grade | Cutting speed Vc (m/min) | Feed per tooth fz (mm/t) |
|---|---|---|---|---|
| P | Mild steels / Unharded steels < 200HB | GH330 | 150 ~ 200 | 0.3 ~ 0.4 |
| P | Carbon steels / Alloy steels < 300HB | GH330 | 150 ~ 200 | 0.17 ~ 0.26 |
| P | Die steels < 50HRC | GH330 | 30 ~ 50 | 0.14 ~ 0.2 |
| M | Stainless steels < 300HB. | GH330 | 150 - 200 | 0.05 - 0.12 |

- Climb milling is recommended.
- When threading a blind hole, use the right hand cutter in right-hand rotation. Cut up from the bottom to prevent chip recutting.
- When machining internal threads from the mouth, use the left-hand cutter in left-hand rotation.

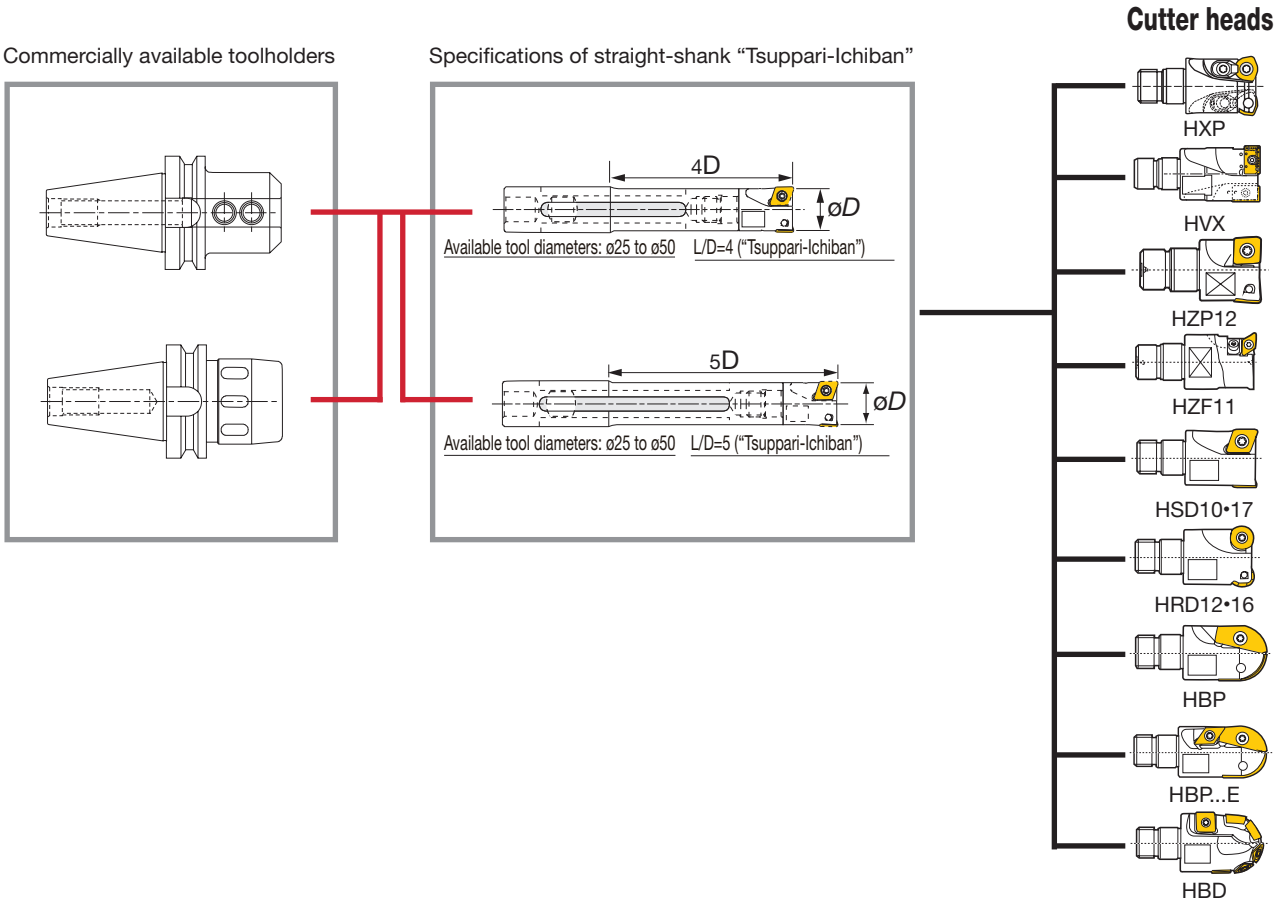
MEMO





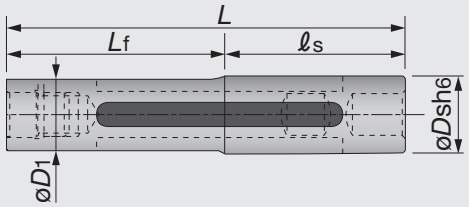

- **Interchangeable head design allows easy tool management and helps select an optimum tool.**
- **"Tsuppari-Ichiban" shank performs high efficiency machining even in long-reach applications.**

## Modular straight shank system



## TMS straight shank

T-Bar Modular System (TMS) with straight shank

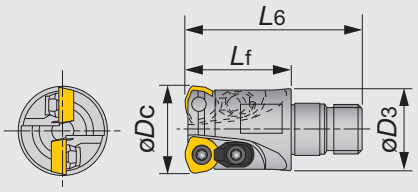


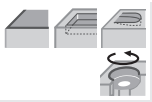

| Designation | øDs | øD1 | L | ℓs | Lf | Cutter |
|---|---|---|---|---|---|---|
| HD02525L128T | 25 | 23 | 128 | 58 | 70 | H...25 |
| HD02525L153T | 25 | 23 | 153 | 58 | 95 | H...25 |
| HD03032L145T | 32 | 28 | 145 | 65 | 80 | HBP030 |
| HD03032L175T | 32 | 28 | 175 | 65 | 110 | HBP030 |
| HD03232L163T | 32 | 30 | 163 | 65 | 98 | H...32 |
| HD03232L195T | 32 | 30 | 195 | 65 | 130 | H...32 |
| HD04042L182T | 42 | 38 | 182 | 72 | 110 | H...40 |
| HD04042L222T | 42 | 38 | 222 | 72 | 150 | H...40 |
| HD05042L222T | 42 | 42 | 222 | 150 | 72 | H...50 |
| HD05042L272T | 42 | 42 | 272 | 150 | 122 | H...50 |

## HXP

Super high feed endmills with T-Bar Modular System (TMS)





| Designation | øDc | z | L6 | Lf | øD3 | Insert | (Option) Wrench |
|---|---|---|---|---|---|---|---|
| HXP06025R | 25 | 2 | 50 | 30 | 23 | WPM*06X415ZP... | KS-21 |
| HXP06026R | 26 | 2 | 50 | 30 | 23 | WPM*06X415ZP... | KS-21 |
| HXP06032R | 32 | 2 | 64 | 35 | 30 | WPM*06X415ZP... | KS-27 |
| HXP06032RB | 32 | 3 | 64 | 35 | 30 | WPM*06X415ZP... | KS-27 |
| HXP06033R | 33 | 2 | 64 | 35 | 30 | WPM*06X415ZP... | KS-27 |
| HXP06033RB | 33 | 3 | 64 | 35 | 30 | WPM*06X415ZP... | KS-27 |
| HXP06040R | 40 | 3 | 84 | 50 | 38 | WPM*06X415ZP... | KS-32 |
| HXP08040R | 40 | 2 | 84 | 50 | 38 | WPMT080615Z*R... | KS-32 |
| HXP06050R | 50 | 4 | 88 | 50 | 42 | WPM*06X415ZP... | KS-36 |
| HXP08050R | 50 | 3 | 88 | 50 | 42 | WPMT080615Z*R... | KS-36 |
| HXP09050R | 50 | 2 | 88 | 50 | 42 | WPMT090725Z*R... | KS-36 |

### SPARE PARTS





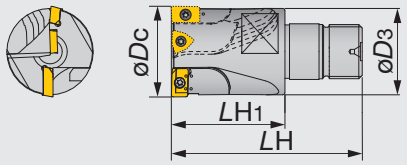


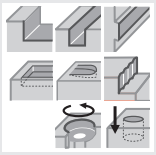
| Designation | Clamping screw | Lubricant | Clamp set | Wrench | Wrench 1 |
|---|---|---|---|---|---|
| HXP06025R - HXP06050R | CSPB-4S | M-1000 | CSY-15 | IP-15D | - |
| HXP08040R, HXP08050R | CSTB-5 | M-1000 | CSX20 | - | T-20T |
| HXP09050R | CSPB-5 | M-1000 | CSY-20 | - | IP-20T |

HXP: Inserts → **D028**, Standard cutting conditions → **D029 -**

## HVX

Multi purpose endmills with center edge in medium diameter, with T-Bar Modular System (TMS)



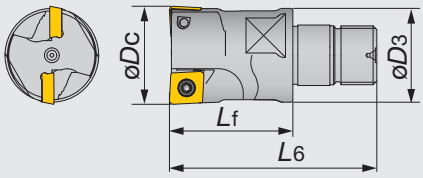
| Designation | øDc | z | LH | LH1 | øD3 | Shank | Insert 1 | Insert 2 |
|---|---|---|---|---|---|---|---|---|
| HVX12025R | 25 | 2 | 55 | 35 | 23 | HD..., HBT... | XXMU12X408PR-MJ | - |
| HVX16032R | 32 | 2 | 69 | 40 | 30 | HD..., HBT... | XXMU16X508PR-MJ | - |
| HVX12040R | 40 | 2 | 84 | 50 | 38 | HD..., HBT... | XXMU12X408PR-MJ | WCMT050308-D4 |
| HVX16050R | 50 | 2 | 88 | 50 | 42 | HD..., HBT... | XXMU16X508PR-MJ | WCMT06T308-D4 |

### SPARE PARTS

| Designation | Clamping screw | Clamping screw 1 | Lubricant | Wrench | Wrench 1 | WRENCH 2 |
|---|---|---|---|---|---|---|
| HVX12025R | - | CSPD-3 | M-1000 | IP-10D | - | KS-21 |
| HVX16032R | CSPB-3.5 | - | M-1000 | IP-15D | - | KS-27 |
| HVX12040R | - | CSPD-3 | M-1000 | IP-10D | - | KS-32 |
| HVX16050R | CSPB-3.5 | CSTB-3.5D | M-1000 | IP-15D | T-9D | KS-36 |

## HZP

"Z-feed" plunging cutter for roughing operation with screw clamp, with T-Bar Modular System (TMS)






| Designation | øDc | z | L6 | Lf | øD3 | Shank | Insert |
|---|---|---|---|---|---|---|---|
| HZP12032R | 32 | 2 | 59 | 30 | 30 | HD..., HBT... | APMT120416PR-MJ |
| HZP12040R | 40 | 2 | 84 | 50 | 38 | HD..., HBT... | APMT120416PR-MJ |

### SPARE PARTS

| Designation | Clamping screw | Lubricant | Wrench | WRENCH 1 |
|---|---|---|---|---|
| HZP12032R | CSTB-3.5T | M-1000 | T-20D | KS-27 |
| HZP12040R | CSTB-3.5T | M-1000 | T-20D | KS-32 |



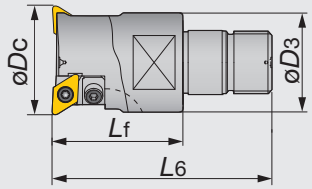
HVX: Inserts, Standard cutting conditions → **D258**

HZP: Inserts → **D220**, Standard cutting conditions → **D221**

## HZF

"Z-feed" plunging endmill for finishing operation, with T-Bar Modular System (TMS)





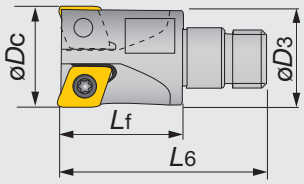

| Designation | øDc | z | L6 | Lf | øD3 | Shank | Insert |
|---|---|---|---|---|---|---|---|
| HZF11032R | 32 | 2 | 59 | 30 | 30 | HD..., HBT... | DPCW11T3ZFR |
| HZF11040R | 40 | 3 | 84 | 50 | 38 | HD..., HBT... | DPCW11T3ZFR |

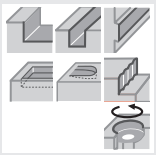
### SPARE PARTS

| Designation | Clamping screw | Adjusting screw | Lubricant | Cartridge clamping screw | Wrench | Wrench 1 | Wrench 2 | Wrench 3 | Locator |
|---|---|---|---|---|---|---|---|---|---|
| HZF11032R | CSTB-4S | - | M-1000 | - | T-15D | - | - | KS-27 | SDUPR09CZ-11 |
| HZF11040R | CSTB-4S | SSHM3-10 | M-1000 | CM4X0.7X12 | T-15D | P-1.5 | P-3 | KS-32 | SDUPR09CZ-11 |

## HSD

Multi purpose square endmills, with T-Bar Modular System (TMS)



| Designation | øDc | z | L6 | Lf | øD3 | Shank | Insert |
|---|---|---|---|---|---|---|---|
| HSD10025R | 25 | 2 | 50 | 30 | 23 | HD..., HBT... | GD*T10H3PD... |
| HSD10032R | 32 | 2 | 59 | 50 | 30 | HD..., HBT... | GD*T10H3PD... |
| HSD10040R | 40 | 3 | 84 | 50 | 38 | HD..., HBT... | GD*T10H3PD... |
| HSD17040R | 40 | 2 | 84 | 50 | 38 | HD..., HBT... | GD*T17X6PD... |
| HSD10050R | 50 | 3 | 88 | 50 | 42 | HD..., HBT... | GD*T10H3PD... |
| HSD17050R | 50 | 2 | 88 | 50 | 42 | HD..., HBT... | GD*T17X6PD... |

### SPARE PARTS

| Designation | Clamping screw | Lubricant | Wrench | Wrench 1 |
|---|---|---|---|---|
| HSD10025R | CSTB-3.5H | M-1000 | T-15D | KS-21 |
| HSD10032R | CSTB-3.5H | M-1000 | T-15D | KS-27 |
| HSD10040R | CSTB-3.5H | M-1000 | T-15D | KS-32 |
| HSD17040R | CSTB-5 | M-1000 | T-20D | KS-32 |
| HSD10050R | CSTB-3.5H | M-1000 | T-15D | KS-36 |
| HSD17050R | CSTB-5 | M-1000 | T-20D | KS-36 |



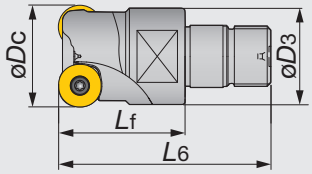
HZF: Inserts → **D222**, Standard cutting conditions → **D223**

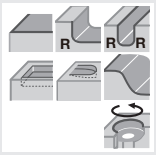
HSD: Inserts, Standard cutting conditions → **D106**

## HRD

Indexable endmills with button insert of 6 mm or 8 mm radius, with T-Bar Modular System (TMS)






| Designation | øDc | z | L6 | Lf | øD3 | Shank | Insert |
|---|---|---|---|---|---|---|---|
| HRD12032R | 32 | 2 | 59 | 30 | 30 | HD..., HBT... | RDM*1204ZD*N(-MJ) |
| HRD12040R | 40 | 3 | 84 | 50 | 38 | HD..., HBT... | RDM*1204ZD*N(-MJ) |
| HRD16040R | 40 | 2 | 84 | 50 | 38 | HD..., HBT... | RDM*1606ZD*N(-MJ) |
| HRD12050R | 50 | 4 | 88 | 50 | 42 | HD..., HBT... | RDM*1204ZD*N(-MJ) |
| HRD16050R | 50 | 3 | 88 | 50 | 42 | HD..., HBT... | RDM*1606ZD*N(-MJ) |

### SPARE PARTS



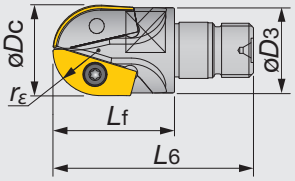


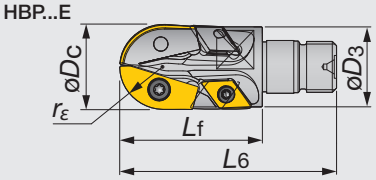

| Designation | Clamping screw | Lubricant | Wrench | Wrench 1 |
|---|---|---|---|---|
| HRD12032R | CSTB-3.5 | M-1000 | T-15D | KS-27 |
| HRD12040R | CSTB-3.5 | M-1000 | T-15D | KS-32 |
| HRD16040R | CSTB-5 | M-1000 | T-20D | KS-32 |
| HRD12050R | CSTB-3.5 | M-1000 | T-15D | KS-36 |
| HRD16050R | CSTB-5 | M-1000 | T-20D | KS-36 |

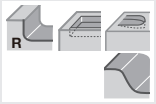
## HBP

Indexable ball-nose endmill for semi-finishing, with T-Bar Modular System (TMS)






| Designation | øDc | z | L6 | Lf | øD3 | Shank | Insert 1 | Insert 2 |
|---|---|---|---|---|---|---|---|---|
| HBP025 | 25 | 2 | 55 | 35 | 23 | HD..., HBT... | ZPET2505-MJ | - |
| HBP025E | 25 | 2 (4) | 65 | 45 | 23 | HD..., HBT... | ZPET2505-MJ | DCMW11T304TN |
| HBP030 | 30 | 2 | 66 | 40 | 28 | HD..., HBT... | ZPET3006-MJ | - |
| HBP030E | 30 | 2 (4) | 76 | 50 | 28 | HD..., HBT... | ZPET3006-MJ | DCMW11T304TN |

### SPARE PARTS







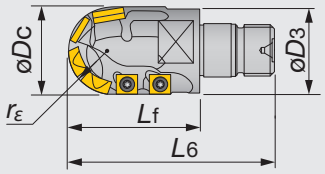

| Designation | Clamping screw | Clamping screw 1 | Lubricant | Wrench | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|
| HBP025* | CSTB-4S | - | M-1000 | T-15D | - | KS-21 |
| HBP030 | CSTB-5S | - | M-1000 | T-20D | - | KS-24 |
| HBP030E | CSTB-4S | CSTB-5S | M-1000 | T-15D | T-20D | KS-24 |

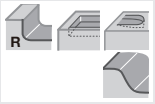

HRD: Inserts → **D207**, Standard cutting conditions → **D208**

HBP: Inserts → **D214**, Standard cutting conditions → **D217**

## HBD

Indexable ball-nose endmill for roughing, with T-Bar Modular System (TMS)




| Designation | øDc | z | L6 | Lf | øD3 | Shank | Insert 1 | Insert 2 |
|---|---|---|---|---|---|---|---|---|
| HBD040E | 40 | 2(7) | 94 | 60 | 38 | HD..., HBT... | ZDMT4005-MJ | SCMT09T308-23 |
| HBD050E | 50 | 2(7) | 113 | 75 | 42 | HD..., HBT... | ZDMT5006-MJ | SCMT120408-23 |

### SPARE PARTS

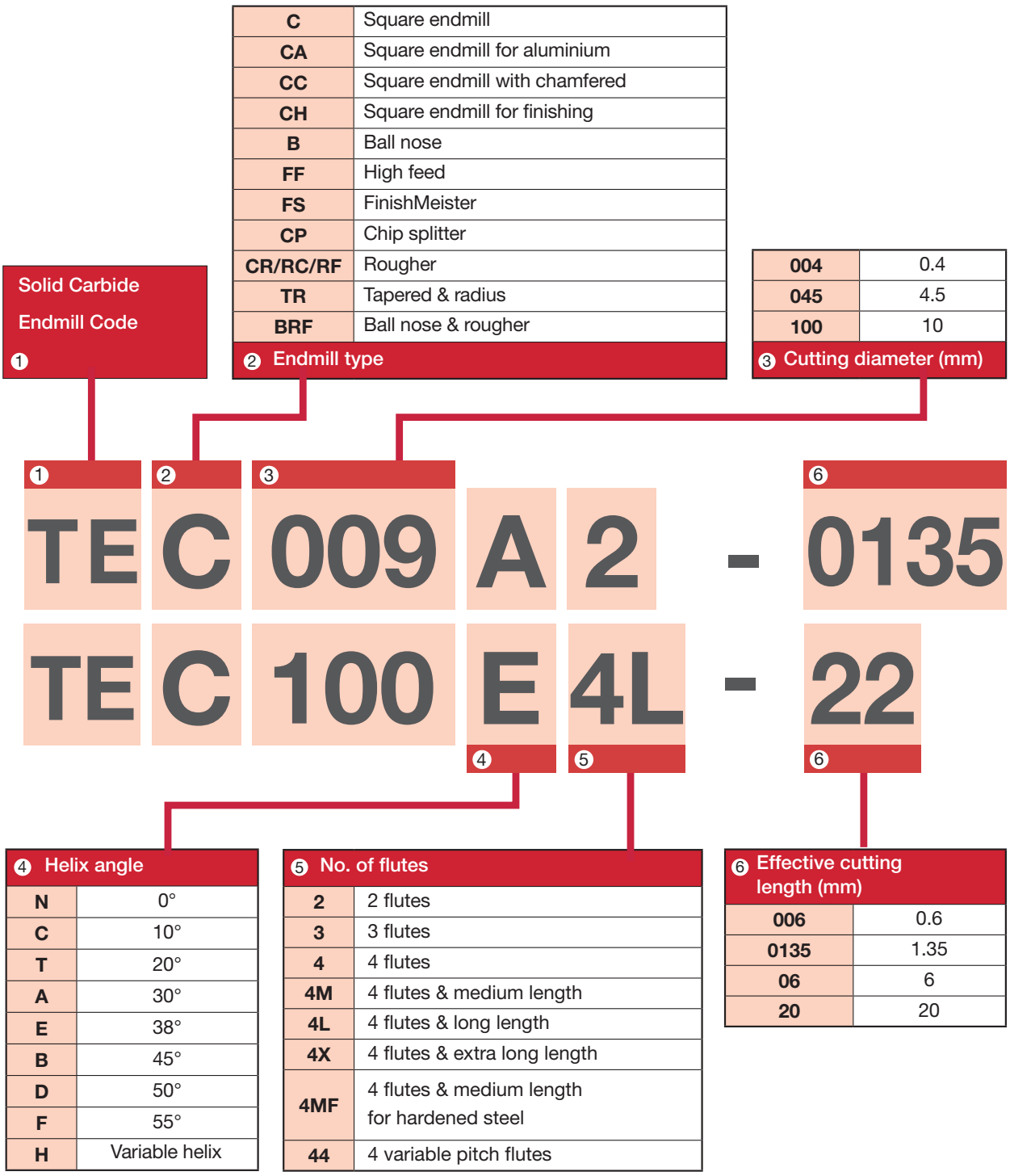
| Designation | Clamping screw | Lubricant | Wrench | Wrench 1 |
|---|---|---|---|---|
| HBD040E | CSTB-4M | M-1000 | T-15T | KS-32 |
| HBD050E | CSTB-5 | M-1000 | T-20T | KS-36 |



HBD: Inserts → **D216**, Standard cutting conditions → **D217**

MEMO

# Designation






## Tungaloy Premium PVD Coated Grades

Tungaloy has achieved remarkable gains in metal removal rates and tool life with solid carbide endmills with a PVD coating, on a very tough submicron substrate.
These new materials provide high toughness and resistance to micro-cracks and chipping.

* TiAlN on a submicron substrate = AH725
* TiAlN on ultra-fine grain substrate = AH750

| Diameter range | Cutting diameter $\varnothing D^{e8}$ | Shank $\varnothing d^{h6}$ |
|---|---|---|
| < 3 | -0.014 - 0.028 | 0 - 0.007 |
| 3 - 6 | -0.02 - 0.038 | 0 - 0.008 |
| 6 - 10 | -0.025 - 0.047 | 0 - 0.009 |
| 10 - 18 | -0.032 - 0.059 | 0 - 0.011 |
| 18 - 30 | -0.04 - 0.073 | 0 - 0.013 |

| | |
|---|---|
| **/04** | 4 |
| **/10 /1.5** | 10 / 1.5° |
| **/14** | 14 |

⑦ Length of neck / Angle neck (mm)

| | |
|---|---|
| **C** | Cylindrical |
| **W** | Weldon |

⑧ Shank type

| | |
|---|---|
| **055** | 5.5 |
| **08** | 8 |
| **4** | 4 |

⑨ Shank diameter (mm)

| ⑦ | ⑧ | ⑨ | | |
|---|---|---|---|---|
| /06 | C | 4 | M | E66 |
| /32 | C | 10 | CF- | 72 |

| | ⑩ |
|---|---|
| | CF- |

| | ⑪ |
|---|---|
| | 72 |

⑩ Workpiece material / Additional feature

| | |
|---|---|
| **-** | General |
| **S** | Stainless steel |
| **M** | Steel medium hardness ≤ 55 HRC |
| **H** | Steel high hardness ≥ 55 HRC |
| **R02A** | Aluminium |
| **CF** | VARIABLEMEISTER |
| **R16** | Corner radius: 1.6 |

⑪ Overall length / Corner radius

| | |
|---|---|
| **66** | 66 mm |
| **180** | 180 mm |
| **E**** | Eco type |
| **M** | Medium |
| **R08** | Corner radius: 0.8 |

### AH725

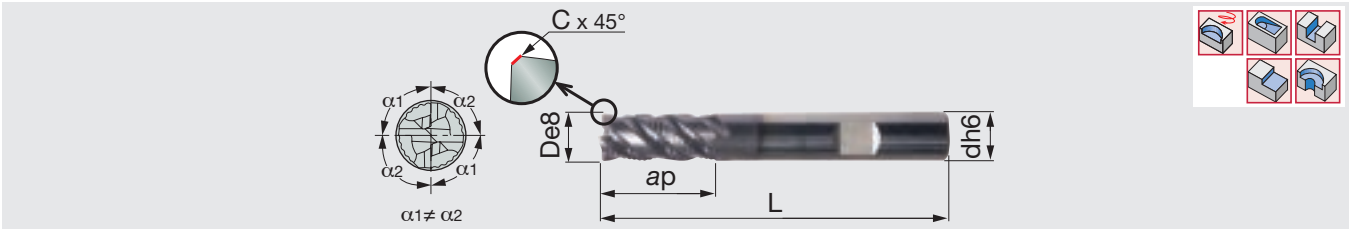
- High thermal and chemical stability.
- High hardness 3500 HV makes higher speeds, machining of harder materials, and dry machining possible. The TiAlN coating can be applied at 800° C.
- Recommended for hardened steel, high-temperature and steel alloys.
- Improves and expedites finishing on dies and molds.
- Longer tool life in high speed machining.

### AH750

- Excellent for machining hard steel up to 70 HRC and high temperature alloys.
- The small grain size improves cutting edge strength and tends to chip less.

## TEFS**E44-**CF...

4 flutes, 38° helix, variable pitch, combination, medium length

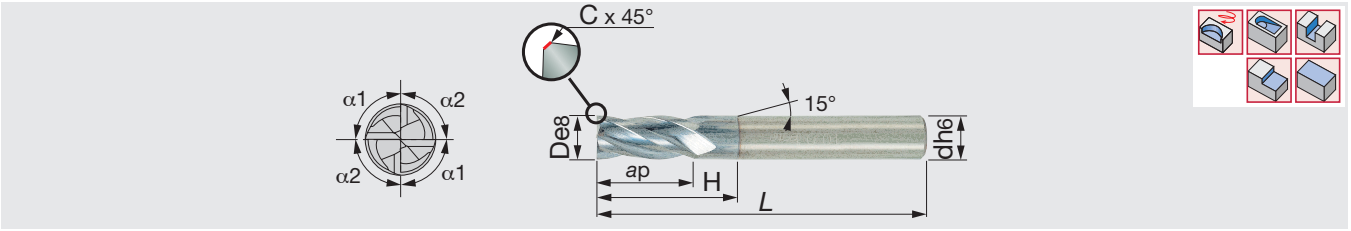



| Designation | AH725 | D | d | C | ap | L | Shank |
|---|---|---|---|---|---|---|---|
| TEFS060E44-14W06CF-57 | ● | 6 | 6 | 0.25 | 14 | 57 | Weldon |
| TEFS080E44-18W08CF-63 | ● | 8 | 8 | 0.3 | 18 | 63 | Weldon |
| TEFS100E44-22W10CF-72 | ● | 10 | 10 | 0.4 | 22 | 72 | Weldon |
| TEFS120E44-26W12CF-83 | ● | 12 | 12 | 0.5 | 26 | 83 | Weldon |
| TEFS140E44-30W14CF-83 | ● | 14 | 14 | 0.5 | 30 | 83 | Weldon |
| TEFS160E44-34W16CF-92 | ● | 16 | 16 | 0.6 | 34 | 92 | Weldon |
| TEFS200E44-42W20CF-104 | ● | 20 | 20 | 0.6 | 42 | 104 | Weldon |
| TEFS250E44-52W25CF-121 | ● | 25 | 25 | 0.6 | 52 | 121 | Weldon |



## TEC**E*L-**CF...

4 flutes endmill, 38° helix, variable pitch for chatter dampening




| Designation | AH725 | D | d | C | ap | H | L | Shank |
|---|---|---|---|---|---|---|---|---|
| TEC030E4L-8/11C06CF-57 | ● | 3 | 6 | 0.1 | 8 | 11 | 57 | Cylindrical |
| TEC040E4L-10/14C06CF-57 | ● | 4 | 6 | 0.15 | 10 | 14 | 57 | Cylindrical |
| TEC050E4L-12/17C06CF-57 | ● | 5 | 6 | 0.18 | 12 | 17 | 57 | Cylindrical |
| TEC060E4L-14/20C06CF-57 | ● | 6 | 6 | 0.25 | 14 | 20 | 57 | Cylindrical |
| TEC080E4L-18/26C08CF-63 | ● | 8 | 8 | 0.3 | 18 | 26 | 63 | Cylindrical |
| TEC100E4L-22/32C10CF-72 | ● | 10 | 10 | 0.4 | 22 | 32 | 72 | Cylindrical |
| TEC120E4L-26/38C12CF-83 | ● | 12 | 12 | 0.5 | 26 | 38 | 83 | Cylindrical |
| TEC160E4L-34/50C16CF-100 | ● | 16 | 16 | 0.6 | 34 | 50 | 100 | Cylindrical |
| TEC200E4L-42/60C20CF-125 | ● | 20 | 20 | 0.6 | 42 | 60 | 125 | Cylindrical |
| TEC250E4L-52/65C25CF-121 | ● | 25 | 25 | 0.6 | 52 | 65 | 121 | Cylindrical |

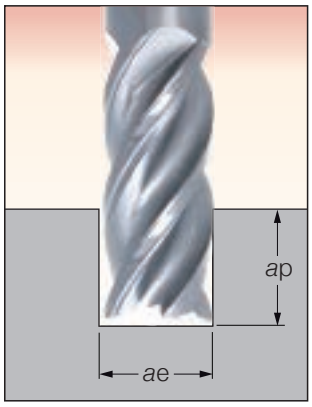
5 flutes endmill, 38° helix, variable pitch for chatter danpening, medium length endmills

| Designation | AH725 | D | d | C | ap | H | L | Shank |
|---|---|---|---|---|---|---|---|---|
| TEC060E5L-15C06CF-57 | ● | 6 | 6 | 0.2 | 15 | - | 57 | Cylindrical |
| TEC080E5L-20C08CF-63 | ● | 8 | 8 | 0.25 | 20 | - | 63 | Cylindrical |
| TEC100E5L-25C10CF-72 | ● | 10 | 10 | 0.3 | 25 | - | 72 | Cylindrical |
| TEC120E5L-30C12CF-83 | ● | 12 | 12 | 0.4 | 30 | - | 83 | Cylindrical |
| TEC160E5L-40C16CF-100 | ● | 16 | 16 | 0.5 | 40 | - | 100 | Cylindrical |
| TEC200E5L-50C20CF-125 | ● | 20 | 20 | 0.5 | 50 | - | 125 | Cylindrical |

**For recommended feed, see next page.**

●: Line-up

## Recommended feed - VariableMeister solid carbide endmills



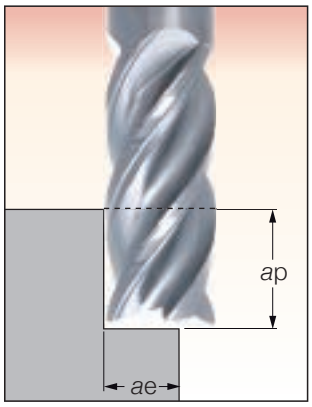

*a*e = D

*a*p = D × 0.5 ~ 1

| ø*D* | Min. *fz* | Max. *fz* |
|---|---|---|
| 6 | 0.025 | 0.06 |
| 8 | 0.03 | 0.08 |
| 10 | 0.03 | 0.09 |
| 12 | 0.035 | 0.1 |
| 16 | 0.05 | 0.12 |
| 20 | 0.05 | 0.15 |
| 25 | 0.05 | 0.15 |

*a*p = D × 1 ~ 2

| ø*D* | Min. *fz* | Max. *fz* |
|---|---|---|
| 6 | 0.025 | 0.05 |
| 8 | 0.03 | 0.05 |
| 10 | 0.03 | 0.05 |
| 12 | 0.035 | 0.06 |
| 16 | 0.04 | 0.07 |
| 20 | 0.05 | 0.08 |
| 25 | 0.05 | 0.08 |




*a*e = D × 45 ~ 75 %

*a*p = D × 0.5 ~ 1

| ø*D* | Min. *fz* | Max. *fz* |
|---|---|---|
| 6 | 0.025 | 0.07 |
| 8 | 0.03 | 0.09 |
| 10 | 0.03 | 0.1 |
| 12 | 0.035 | 0.11 |
| 16 | 0.05 | 0.13 |
| 20 | 0.05 | 0.17 |
| 25 | 0.05 | 0.17 |

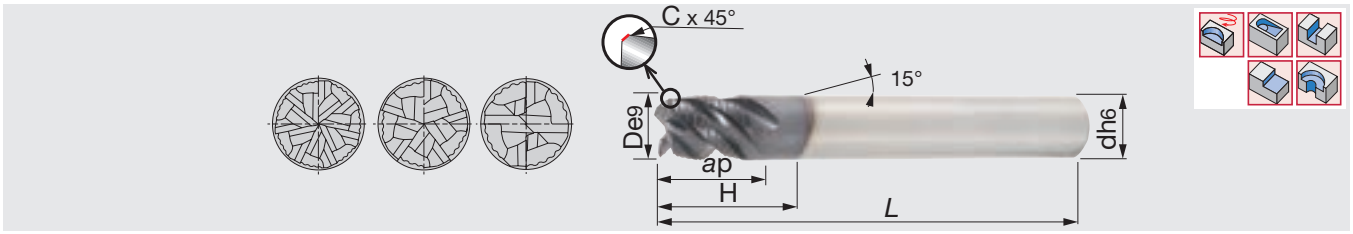
*a*p = D × 1 ~ 2

| ø*D* | Min. *fz* | Max. *fz* |
|---|---|---|
| 6 | 0.025 | 0.06 |
| 8 | 0.03 | 0.08 |
| 10 | 0.03 | 0.09 |
| 12 | 0.035 | 0.1 |
| 16 | 0.05 | 0.11 |
| 20 | 0.05 | 0.11 |
| 25 | 0.05 | 0.11 |

• For the cutting conditions, please see D310.

## TECR**B*S...

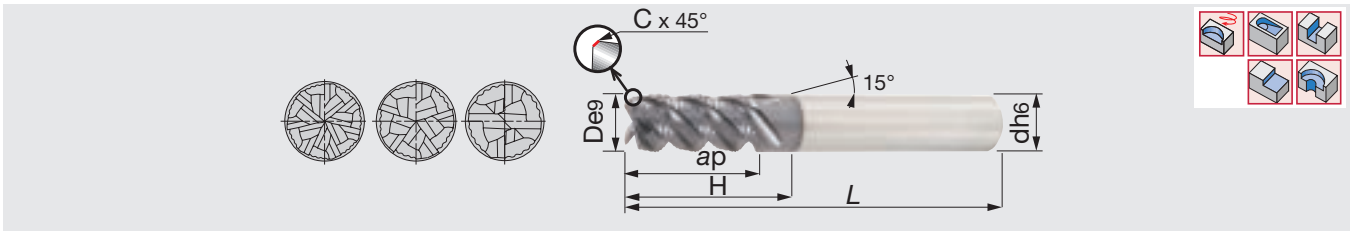
4 - 7 flutes rougher, 45° helix, short length (1xD)




| Designation | AH725 | D | *d* | C | *ap* | H | *L* | z | | Shank |
|---|---|---|---|---|---|---|---|---|---|---|
| TECR050B4S-05W06-57 | ● | 5 | 6 | 0.2 | 5 | 10 | 57 | 4 | ● | Weldon |
| TECR060B4S-06W06-57 | ● | 6 | 6 | 0.25 | 6 | - | 57 | 4 | ● | Weldon |
| TECR080B4S-08W08-63 | ● | 8 | 8 | 0.25 | 8 | - | 63 | 4 | ● | Weldon |
| TECR100B4S-10W10-72 | ● | 10 | 10 | 0.3 | 10 | - | 72 | 4 | ● | Weldon |
| TECR120B4S-12W12-83 | ● | 12 | 12 | 0.35 | 12 | - | 83 | 4 | ● | Weldon |
| TECR160B5S-16W16-92 | ● | 16 | 16 | 0.4 | 16 | - | 92 | 5 | | Weldon |
| TECR200B7S-20W20-104 | ● | 20 | 20 | 0.4 | 20 | - | 104 | 7 | | Weldon |

## TECR**B*M...

4 - 7 flutes rougher, 45° helix, medium length (2xD)




| Designation | AH725 | D | *d* | C | *ap* | H | *L* | z | | Shank |
|---|---|---|---|---|---|---|---|---|---|---|
| TECR050B4M-10W06-57 | ● | 5 | 6 | 0.2 | 10 | 15 | 57 | 4 | ● | Weldon |
| TECR060B4M-12W06-57 | ● | 6 | 6 | 0.25 | 12 | - | 57 | 4 | ● | Weldon |
| TECR080B4M-16W08-63 | ● | 8 | 8 | 0.25 | 16 | - | 63 | 4 | ● | Weldon |
| TECR100B4M-20W10-72 | ● | 10 | 10 | 0.3 | 20 | - | 72 | 4 | ● | Weldon |
| TECR120B4M-24W12-83 | ● | 12 | 12 | 0.35 | 24 | - | 83 | 4 | ● | Weldon |
| TECR160B5M-32W16-92 | ● | 16 | 16 | 0.4 | 32 | - | 92 | 5 | | Weldon |
| TECR200B7M-40W20-104 | ● | 20 | 20 | 0.4 | 40 | - | 104 | 7 | | Weldon |

First choice in roughing applications.

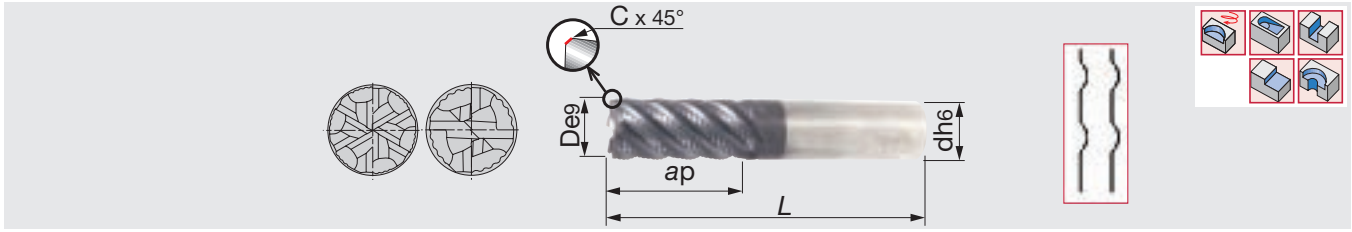


●: Line-up

SHREDMEISTER

## TECR**B*MF...

4, 6 flutes rougher, 45° helix, medium length,for machining hardened steel and titanium alloys



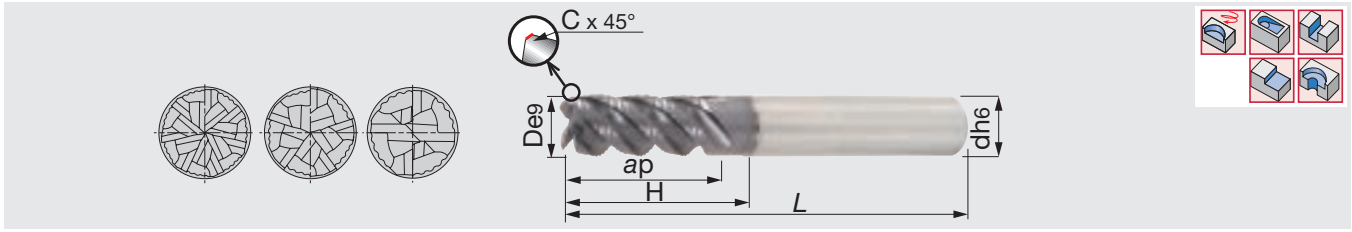

| Designation | AH725 | D | d | C | ap | L | z | Shank |
|---|---|---|---|---|---|---|---|---|
| TECR060B4MF-14W06-57 | ● | 6 | 6 | 0.25 | 14 | 57 | 4 | Weldon |
| TECR080B4MF-18W08-63 | ● | 8 | 8 | 0.3 | 18 | 63 | 4 | Weldon |
| TECR100B4MF-22W10-72 | ● | 10 | 10 | 0.3 | 22 | 72 | 4 | Weldon |
| TECR120B4MF-26W12-83 | ● | 12 | 12 | 0.4 | 26 | 83 | 4 | Weldon |
| TECR140B4MF-30W14-83 | ● | 14 | 14 | 0.4 | 30 | 83 | 4 | Weldon |
| TECR160B6MF-34W16-92 | ● | 16 | 16 | 0.5 | 34 | 92 | 6 | Weldon |
| TECR200B6MF-42W20-104 | ● | 20 | 20 | 0.7 | 42 | 104 | 6 | Weldon |
| TECR250B6MF-52W25-121 | ● | 25 | 25 | 0.9 | 52 | 121 | 6 | Weldon |

The rougher's cutting edge profile has shallow serrations. This is a very durable design which leaves only a small amount of material for the finishing cut.

SHREDMEISTER

## TECR**B*L...

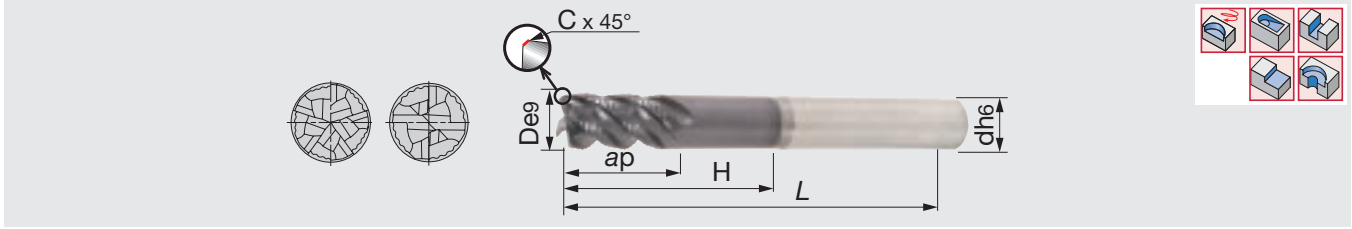
4 - 7 flutes rougher, 45° helix, long reach (3xD)




| Designation | AH725 | D | d | C | ap | H | L | z | | Shank |
|---|---|---|---|---|---|---|---|---|---|---|
| TECR060B4L-12/18W06-57 | ● | 6 | 6 | 0.25 | 12 | 18 | 57 | 4 | ● | Weldon |
| TECR080B4L-16/24W08-63 | ● | 8 | 8 | 0.25 | 16 | 24 | 63 | 4 | ● | Weldon |
| TECR100B4L-20/30W10-72 | ● | 10 | 10 | 0.3 | 20 | 30 | 72 | 4 | ● | Weldon |
| TECR120B4L-24/36W12-83 | ● | 12 | 12 | 0.35 | 24 | 36 | 83 | 4 | ● | Weldon |
| TECR160B5L-32/48W16-100 | ● | 16 | 16 | 0.4 | 32 | 48 | 100 | 5 | | Weldon |
| TECR200B7L-40/60W20-110 | ● | 20 | 20 | 0.4 | 40 | 60 | 110 | 7 | | Weldon |

## TECR**B*X...

4 - 5 flutes rougher, 45° helix, extra long reach (4xD)




| Designation | AH725 | D | d | C | ap | H | L | z | | Shank |
|---|---|---|---|---|---|---|---|---|---|---|
| TECR080B4X-12/32W08-68 | ● | 8 | 8 | 0.25 | 12 | 32 | 68 | 4 | ● | Weldon |
| TECR100B4X-15/40W10-80 | ● | 10 | 10 | 0.3 | 15 | 40 | 80 | 4 | ● | Weldon |
| TECR120B4X-18/48W12-100 | ● | 12 | 12 | 0.35 | 18 | 48 | 100 | 4 | ● | Weldon |
| TECR160B5X-24/64W16-115 | ● | 16 | 16 | 0.4 | 24 | 64 | 115 | 5 | | Weldon |

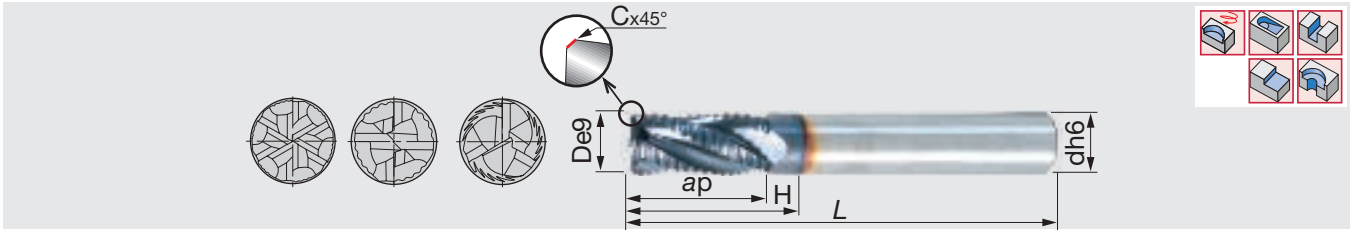
First choice in roughing applications.

●: Line-up

Multi Function

## TERF**A..., TERF**E...

3 - 6 flutes rougher, 30° and 38° helix, medium length fine pitch for alloy steel, stainless steel

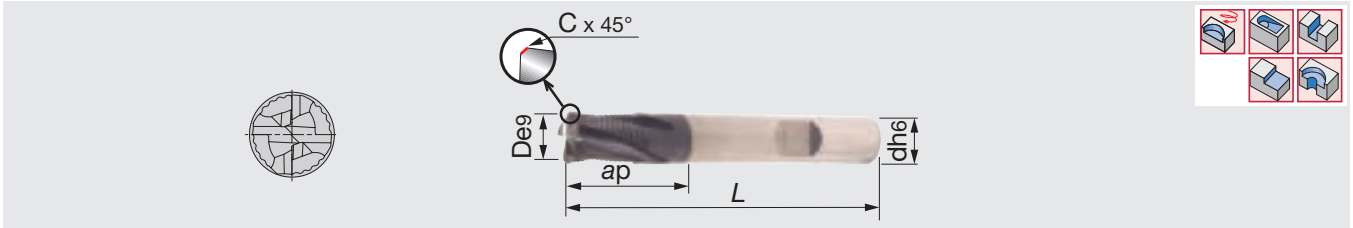



| Designation | AH725 | D | *d* | C | *ap* | H | *L* | Helix | z | Shank |
|---|---|---|---|---|---|---|---|---|---|---|
| TERF040E3-08C06-57 | ● | 4 | 6 | 0.25 | 8 | 13 | 57 | 38° | 3 | Cylindrical |
| TERF050E3-10C06-57 | ● | 5 | 6 | 0.3 | 10 | 17 | 57 | 38° | 3 | Cylindrical |
| TERF060E3-13C06-57 | ● | 6 | 6 | 0.3 | 13 | 21 | 57 | 38° | 3 | Cylindrical |
| TERF070E3-20C08-63 | ● | 7 | 8 | 0.3 | 20 | 26 | 63 | 38° | 3 | Cylindrical |
| TERF080E3-20C08-63 | ● | 8 | 8 | 0.3 | 20 | 28 | 63 | 38° | 3 | Cylindrical |
| TERF090A4-22C10-72 | ● | 9 | 10 | 0.3 | 22 | 30 | 72 | 30° | 4 | Cylindrical |
| TERF100A4-22C10-72 | ● | 10 | 10 | 0.3 | 22 | 30 | 72 | 30° | 4 | Cylindrical |
| TERF110A4-25C12-83 | ● | 11 | 12 | 0.3 | 25 | 32 | 83 | 30° | 4 | Cylindrical |
| TERF120A4-25C12-83 | ● | 12 | 12 | 0.4 | 25 | 37 | 83 | 30° | 4 | Cylindrical |
| TERF140A4-25C14-83 | ● | 14 | 14 | 0.5 | 25 | 37 | 83 | 30° | 4 | Cylindrical |
| TERF160A4-32C16-92 | ● | 16 | 16 | 0.5 | 32 | 44 | 92 | 30° | 4 | Cylindrical |
| TERF180A4-32C18-92 | ● | 18 | 18 | 0.5 | 32 | 44 | 92 | 30° | 4 | Cylindrical |
| TERF200A4-38C20-104 | ● | 20 | 20 | 0.6 | 38 | 55 | 104 | 30° | 4 | Cylindrical |
| TERF250A6-45C25-121 | ● | 25 | 25 | 0.6 | 45 | 64 | 121 | 30° | 6 | Cylindrical |

Multi Function

## TECR**T4M...

4 flutes rougher, 20° helix, medium length




| Designation | AH725 | D | *d* | C | *ap* | *L* | z | Shank |
|---|---|---|---|---|---|---|---|---|
| TECR060T4M-10W06-57 | ● | 6 | 6 | 0.3 | 10 | 57 | 4 | Weldon |
| TECR080T4M-16W08-63 | ● | 8 | 8 | 0.4 | 16 | 63 | 4 | Weldon |
| TECR100T4M-20W10-72 | ● | 10 | 10 | 0.4 | 20 | 72 | 4 | Weldon |
| TECR120T4M-24W12-83 | ● | 12 | 12 | 0.4 | 24 | 83 | 4 | Weldon |
| TECR160T4M-32W16-92 | ● | 16 | 16 | 0.5 | 32 | 92 | 4 | Weldon |
| TECR200T4M-40W20-104 | ● | 20 | 20 | 0.5 | 40 | 104 | 4 | Weldon |

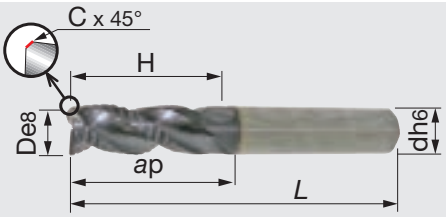
**For maximum metal removal.**

●: Line-up

## TECP**E*L...

### 3 flutes chip splitter rougher, 38° helix, medium length

M
Stainless




| Designation | AH725 | D | *d* | C | *ap* | H | *L* | Shank |
|---|---|---|---|---|---|---|---|---|
| TECP050E3L-12/17W06S57 | ● | 5 | 6 | 0.3 | 12 | 17 | 57 | Weldon |
| TECP060E3L-14/20W06S57 | ● | 6 | 6 | 0.4 | 14 | 20 | 57 | Weldon |
| TECP080E3L-18/26W08S63 | ● | 8 | 8 | 0.4 | 18 | 26 | 63 | Weldon |
| TECP100E3L-22/32W10S72 | ● | 10 | 10 | 0.4 | 22 | 32 | 72 | Weldon |
| TECP120E3L-26/38W12S83 | ● | 12 | 12 | 0.4 | 26 | 38 | 83 | Weldon |
| TECP140E3L-30/44W14S100 | ● | 14 | 14 | 0.6 | 30 | 44 | 100 | Weldon |
| TECP160E3L-34/50W16S100 | ● | 16 | 16 | 0.5 | 34 | 50 | 100 | Weldon |
| TECP200E3L-42/62W20S125 | ● | 20 | 20 | 0.5 | 42 | 62 | 125 | Weldon |

### 4 flutes chip splitter rougher, 38° helix, medium length

| Designation | AH725 | D | *d* | C | *ap* | H | *L* | Shank |
|---|---|---|---|---|---|---|---|---|
| TECP050E4L-12/17W06S57 | ● | 5 | 6 | 0.3 | 12 | 17 | 57 | Weldon |
| TECP060E4L-14/20W06S57 | ● | 6 | 6 | 0.4 | 14 | 20 | 57 | Weldon |
| TECP080E4L-18/26W08S63 | ● | 8 | 8 | 0.4 | 18 | 26 | 63 | Weldon |
| TECP100E4L-22/32W10S72 | ● | 10 | 10 | 0.4 | 22 | 32 | 72 | Weldon |
| TECP120E4L-26/38W12S83 | ● | 12 | 12 | 0.4 | 26 | 38 | 83 | Weldon |
| TECP140E4L-30/44W14S100 | ● | 14 | 14 | 0.6 | 30 | 44 | 100 | Weldon |
| TECP160E4L-34/50W16S100 | ● | 16 | 16 | 0.5 | 34 | 50 | 100 | Weldon |
| TECP200E4L-42/62W20S125 | ● | 20 | 20 | 0.5 | 42 | 62 | 125 | Weldon |

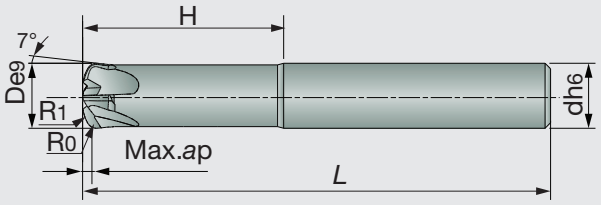
**Most recommended for machining stainless steel.**

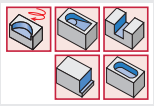


●: Line-up

## TEFF**N4...

High feed, 4 flutes solid carbide endmills



| Designation | AH750 | D | *d* | R0(1) | R1 | Max. *a*p | H | L | Max. fz mm/t |
|---|---|---|---|---|---|---|---|---|---|
| TEFF060N4-030/20C06R1M | ● | 6 | 6 | 1 | 5.3 | 0.3 | 20 | 57 | 0.3 |
| TEFF080N4-040/26C08R13M | ● | 8 | 8 | 1.3 | 7 | 0.4 | 26 | 63 | 0.4 |
| TEFF100N4-050/30C10R16M | ● | 10 | 10 | 1.6 | 8.8 | 0.5 | 30 | 72 | 0.5 |
| TEFF120N4-060/34C12R2M | ● | 12 | 12 | 2 | 10.6 | 0.6 | 34 | 83 | 0.5 |
| TEFF160N4-080/42C16R26M | ● | 16 | 16 | 2.6 | 14 | 0.8 | 42 | 92 | 0.6 |
| TEFF200N4-100/46C20R32M | ● | 20 | 20 | 3.2 | 17.7 | 1 | 46 | 104 | 0.7 |

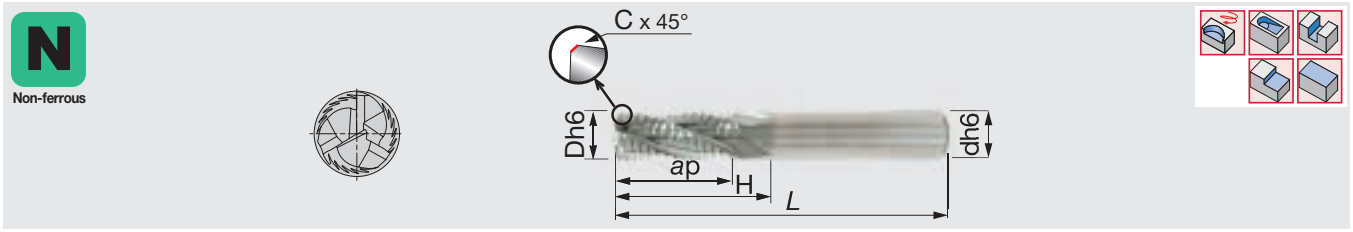
(1) R0 should be used for programming.



●: Line-up

## TERC**E3...

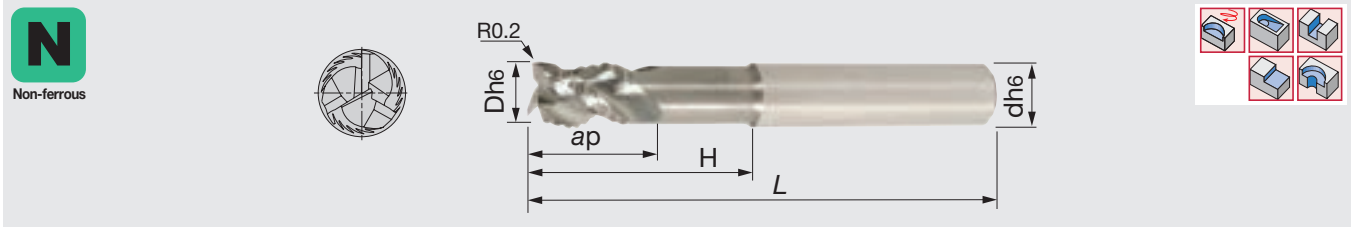
3 flutes rougher, 38° helix, medium length for maximum stock removal in aluminium.
Coarse pitch for aluminium and nonferrous materials.



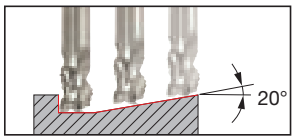

| Designation | KS15F | D | *d* | C | *ap* | H | *L* | Shank |
|---|---|---|---|---|---|---|---|---|
| TERC060E3-13C06-57 | ● | 6 | 6 | 0.5 | 13 | 21 | 57 | Cylindrical |
| TERC080E3-20C08-63 | ● | 8 | 8 | 0.5 | 20 | 28 | 63 | Cylindrical |
| TERC100E3-22C10-72 | ● | 10 | 10 | 0.6 | 22 | 30 | 72 | Cylindrical |
| TERC120E3-25C12-83 | ● | 12 | 12 | 0.6 | 25 | 37 | 83 | Cylindrical |
| TERC140E3-25C14-83 | ● | 14 | 14 | 0.6 | 25 | 37 | 83 | Cylindrical |
| TERC160E3-32C16-92 | ● | 16 | 16 | 0.6 | 32 | 44 | 92 | Cylindrical |
| TERC200E3-38C20-104 | ● | 20 | 20 | 0.7 | 38 | 55 | 104 | Cylindrical |

## TECR**B3...

3 flutes rougher for aluminium, 45° helix, medium length




| Designation | KS15F | D | *d* | *ap* | H | *L* | Shank |
|---|---|---|---|---|---|---|---|
| TECR060B3-09/21C06R02A57 | ● | 6 | 6 | 9 | 21 | 57 | Cylindrical |
| TECR080B3-12/27C08R02A63 | ● | 8 | 8 | 12 | 27 | 63 | Cylindrical |
| TECR100B3-12/31C10R02A72 | ● | 10 | 10 | 12 | 31 | 72 | Cylindrical |
| TECR120B3-12/37C12R02A83 | ● | 12 | 12 | 12 | 37 | 83 | Cylindrical |
| TECR160B3-14/43C16R02A92 | ● | 16 | 16 | 14 | 43 | 92 | Cylindrical |
| TECR200B3-17/53C20R02A104 | ● | 20 | 20 | 17 | 53 | 104 | Cylindrical |




Rampdown angle



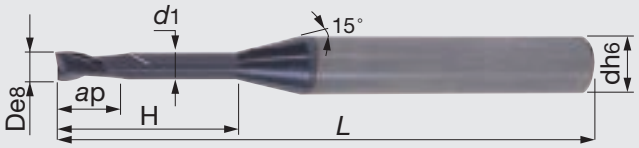
●: Line-up

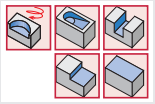
## TEC**A2-**C*M...

2 flutes endmill for rib processing, 30° helix for materials up to 65 HRC

H
Hard Materials





| Designation | AH750 | D | d | d1 | ap | H | L | Shank |
|---|---|---|---|---|---|---|---|---|
| TEC004A2-006/02C4M45 | ● | 0.4 | 4 | 0.37 | 0.6 | 2 | 45 | Cylindrical |
| TEC004A2-006/04C4M45 | ● | 0.4 | 4 | 0.37 | 0.6 | 4 | 45 | Cylindrical |
| TEC005A2-007/02C4M45 | ● | 0.5 | 4 | 0.45 | 0.7 | 2 | 45 | Cylindrical |
| TEC005A2-007/04C4M45 | ● | 0.5 | 4 | 0.45 | 0.7 | 4 | 45 | Cylindrical |
| TEC005A2-007/06C4M45 | ● | 0.5 | 4 | 0.45 | 0.7 | 6 | 45 | Cylindrical |
| TEC006A2-009/02C4M45 | ● | 0.6 | 4 | 0.55 | 0.9 | 2 | 45 | Cylindrical |
| TEC006A2-009/04C4M45 | ● | 0.6 | 4 | 0.55 | 0.9 | 4 | 45 | Cylindrical |
| TEC006A2-009/06C4M45 | ● | 0.6 | 4 | 0.55 | 0.9 | 6 | 45 | Cylindrical |
| TEC007A2-010/02C4M45 | ● | 0.7 | 4 | 0.65 | 1 | 2 | 45 | Cylindrical |
| TEC007A2-010/04C4M45 | ● | 0.7 | 4 | 0.65 | 1 | 4 | 45 | Cylindrical |
| TEC007A2-010/06C4M45 | ● | 0.7 | 4 | 0.65 | 1 | 6 | 45 | Cylindrical |
| TEC008A2-012/04C4M45 | ● | 0.8 | 4 | 0.75 | 1.2 | 4 | 45 | Cylindrical |
| TEC008A2-012/06C4M45 | ● | 0.8 | 4 | 0.75 | 1.2 | 6 | 45 | Cylindrical |
| TEC008A2-012/08C4M45 | ● | 0.8 | 4 | 0.75 | 1.2 | 8 | 45 | Cylindrical |
| TEC009A2-0135/06C4M45 | ● | 0.9 | 4 | 0.85 | 1.35 | 6 | 45 | Cylindrical |
| TEC009A2-0135/08C4M45 | ● | 0.9 | 4 | 0.85 | 1.35 | 8 | 45 | Cylindrical |
| TEC009A2-0135/10C4M45 | ● | 0.9 | 4 | 0.85 | 1.35 | 10 | 45 | Cylindrical |
| TEC010A2-015/04C4M45 | ● | 1 | 4 | 0.97 | 1.5 | 4 | 45 | Cylindrical |
| TEC010A2-015/06C4M45 | ● | 1 | 4 | 0.97 | 1.5 | 6 | 45 | Cylindrical |
| TEC010A2-015/08C4M45 | ● | 1 | 4 | 0.95 | 1.5 | 8 | 45 | Cylindrical |
| TEC010A2-015/10C4M45 | ● | 1 | 4 | 0.95 | 1.5 | 10 | 45 | Cylindrical |
| TEC010A2-015/12C4M45 | ● | 1 | 4 | 0.93 | 1.5 | 12 | 45 | Cylindrical |
| TEC010A2-015/16C4M50 | ● | 1 | 4 | 0.93 | 1.5 | 16 | 50 | Cylindrical |
| TEC012A2-018/06C4M45 | ● | 1.2 | 4 | 1.17 | 1.8 | 6 | 45 | Cylindrical |
| TEC012A2-018/08C4M45 | ● | 1.2 | 4 | 1.15 | 1.8 | 8 | 45 | Cylindrical |
| TEC012A2-018/10C4M45 | ● | 1.2 | 4 | 1.15 | 1.8 | 10 | 45 | Cylindrical |
| TEC012A2-018/12C4M45 | ● | 1.2 | 4 | 1.13 | 1.8 | 12 | 45 | Cylindrical |
| TEC012A2-018/16C4M50 | ● | 1.2 | 4 | 1.13 | 1.8 | 16 | 50 | Cylindrical |
| TEC014A2-021/06C4M45 | ● | 1.4 | 4 | 1.35 | 2.1 | 6 | 45 | Cylindrical |
| TEC014A2-021/08C4M45 | ● | 1.4 | 4 | 1.35 | 2.1 | 8 | 45 | Cylindrical |
| TEC014A2-021/10C4M45 | ● | 1.4 | 4 | 1.35 | 2.1 | 10 | 45 | Cylindrical |
| TEC014A2-021/12C4M45 | ● | 1.4 | 4 | 1.33 | 2.1 | 12 | 45 | Cylindrical |
| TEC014A2-021/16C4M50 | ● | 1.4 | 4 | 1.31 | 2.1 | 16 | 50 | Cylindrical |
| TEC015A2-023/06C4M45 | ● | 1.5 | 4 | 1.47 | 2.3 | 6 | 45 | Cylindrical |
| TEC015A2-023/08C4M45 | ● | 1.5 | 4 | 1.45 | 2.3 | 8 | 45 | Cylindrical |
| TEC015A2-023/10C4M45 | ● | 1.5 | 4 | 1.45 | 2.3 | 10 | 45 | Cylindrical |
| TEC015A2-023/12C4M45 | ● | 1.5 | 4 | 1.43 | 2.3 | 12 | 45 | Cylindrical |
| TEC015A2-023/16C4M50 | ● | 1.5 | 4 | 1.41 | 2.3 | 16 | 50 | Cylindrical |



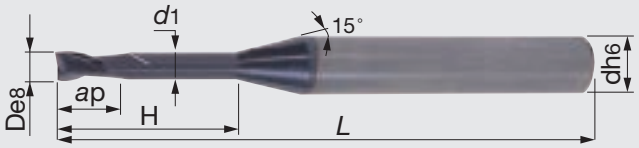
●: Line-up

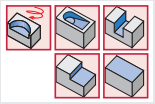
# TEC**A2-**C*M...

2 flutes endmill for rib processing, 30° helix for materials up to 65 HRC

H
Hard Materials





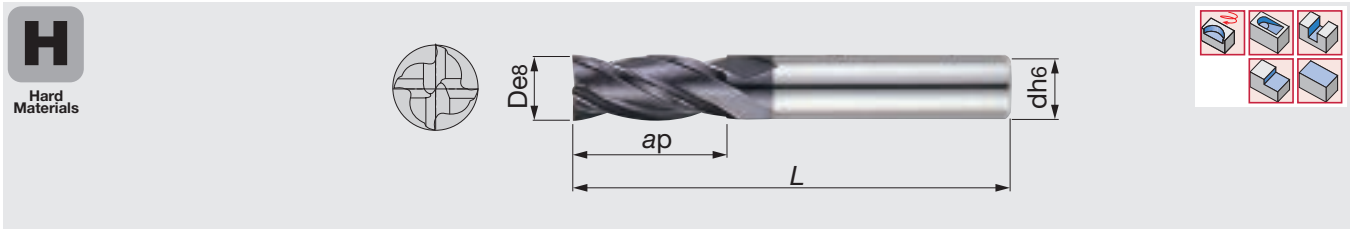
| Designation | AH750 | D | d | d1 | ap | H | L | Shank |
|---|---|---|---|---|---|---|---|---|
| TEC015A2-023/18C4M55 | ● | 1.5 | 4 | 1.41 | 2.3 | 18 | 55 | Cylindrical |
| TEC015A2-023/20C4M55 | ● | 1.5 | 4 | 1.41 | 2.3 | 20 | 55 | Cylindrical |
| TEC016A2-024/06C4M45 | ● | 1.6 | 4 | 1.57 | 2.4 | 6 | 45 | Cylindrical |
| TEC016A2-024/08C4M45 | ● | 1.6 | 4 | 1.55 | 2.4 | 8 | 45 | Cylindrical |
| TEC016A2-024/10C4M45 | ● | 1.6 | 4 | 1.55 | 2.4 | 10 | 45 | Cylindrical |
| TEC016A2-024/12C4M45 | ● | 1.6 | 4 | 1.53 | 2.4 | 12 | 45 | Cylindrical |
| TEC016A2-024/16C4M50 | ● | 1.6 | 4 | 1.53 | 2.4 | 16 | 50 | Cylindrical |
| TEC016A2-024/18C4M55 | ● | 1.6 | 4 | 1.53 | 2.4 | 18 | 55 | Cylindrical |
| TEC016A2-024/20C4M55 | ● | 1.6 | 4 | 1.53 | 2.4 | 20 | 55 | Cylindrical |
| TEC016A2-024/26C4M60 | ● | 1.6 | 4 | 1.53 | 2.4 | 26 | 60 | Cylindrical |
| TEC018A2-027/06C4M45 | ● | 1.8 | 4 | 1.77 | 2.7 | 6 | 45 | Cylindrical |
| TEC018A2-027/08C4M45 | ● | 1.8 | 4 | 1.75 | 2.7 | 8 | 45 | Cylindrical |
| TEC018A2-027/10C4M45 | ● | 1.8 | 4 | 1.75 | 2.7 | 10 | 45 | Cylindrical |
| TEC018A2-027/12C4M45 | ● | 1.8 | 4 | 1.73 | 2.7 | 12 | 45 | Cylindrical |
| TEC018A2-027/16C4M50 | ● | 1.8 | 4 | 1.71 | 2.7 | 16 | 50 | Cylindrical |
| TEC018A2-027/18C4M55 | ● | 1.8 | 4 | 1.71 | 2.7 | 18 | 55 | Cylindrical |
| TEC018A2-027/20C4M55 | ● | 1.8 | 4 | 1.69 | 2.7 | 20 | 55 | Cylindrical |
| TEC020A2-030/06C4M45 | ● | 2 | 4 | 1.97 | 3 | 6 | 45 | Cylindrical |
| TEC020A2-030/08C4M45 | ● | 2 | 4 | 1.95 | 3 | 8 | 45 | Cylindrical |
| TEC020A2-030/10C4M45 | ● | 2 | 4 | 1.95 | 3 | 10 | 45 | Cylindrical |
| TEC020A2-030/12C4M45 | ● | 2 | 4 | 1.93 | 3 | 12 | 45 | Cylindrical |
| TEC020A2-030/16C4M50 | ● | 2 | 4 | 1.91 | 3 | 16 | 50 | Cylindrical |
| TEC020A2-030/20C4M55 | ● | 2 | 4 | 1.89 | 3 | 20 | 55 | Cylindrical |
| TEC020A2-030/30C4M70 | ● | 2 | 4 | 1.89 | 3 | 30 | 70 | Cylindrical |
| TEC025A2-037/08C4M45 | ● | 2.5 | 4 | 2.4 | 3.7 | 8 | 45 | Cylindrical |
| TEC025A2-037/10C4M45 | ● | 2.5 | 4 | 2.4 | 3.7 | 10 | 45 | Cylindrical |
| TEC025A2-037/12C4M45 | ● | 2.5 | 4 | 2.4 | 3.7 | 12 | 45 | Cylindrical |
| TEC025A2-037/16C4M55 | ● | 2.5 | 4 | 2.4 | 3.7 | 16 | 55 | Cylindrical |
| TEC025A2-037/20C4M60 | ● | 2.5 | 4 | 2.4 | 3.7 | 20 | 60 | Cylindrical |
| TEC025A2-037/30C4M80 | ● | 2.5 | 4 | 2.4 | 3.7 | 30 | 80 | Cylindrical |
| TEC030A2-045/08C6M45 | ● | 3 | 6 | 2.85 | 4.5 | 8 | 45 | Cylindrical |
| TEC030A2-045/10C6M45 | ● | 3 | 6 | 2.85 | 4.5 | 10 | 45 | Cylindrical |
| TEC030A2-045/12C6M45 | ● | 3 | 6 | 2.85 | 4.5 | 12 | 45 | Cylindrical |
| TEC030A2-045/16C6M55 | ● | 3 | 6 | 2.85 | 4.5 | 16 | 55 | Cylindrical |
| TEC030A2-045/20C6M60 | ● | 3 | 6 | 2.85 | 4.5 | 20 | 60 | Cylindrical |
| TEC030A2-045/30C6M70 | ● | 3 | 6 | 2.85 | 4.5 | 30 | 70 | Cylindrical |
| TEC030A2-045/40C6M90 | ● | 3 | 6 | 2.85 | 4.5 | 40 | 90 | Cylindrical |



●: Line-up

## TEC**A4-**C...

4 flutes, 30° helix, medium length for materials up to 65 HRC

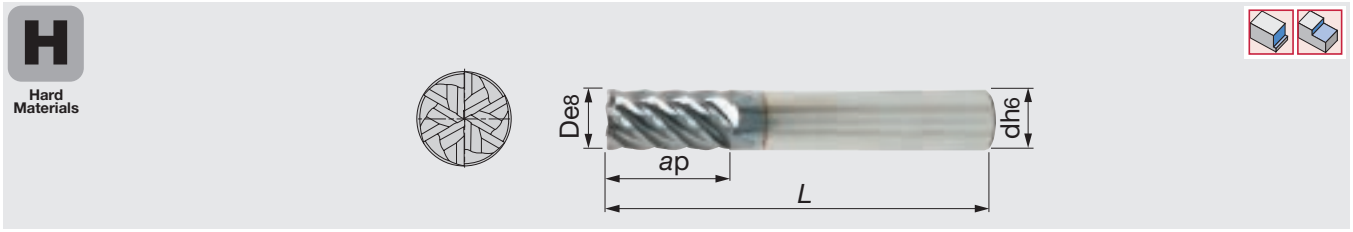



| Designation | AH750 | D | *d* | *ap* | *L* | Shank |
|---|---|---|---|---|---|---|
| TEC040A4-11C06-45 | ● | 4 | 6 | 11 | 45 | Cylindrical |
| TEC050A4-13C06-50 | ● | 5 | 6 | 13 | 50 | Cylindrical |
| TEC060A4-13C06-50 | ● | 6 | 6 | 13 | 50 | Cylindrical |
| TEC070A4-16C08-60 | ● | 7 | 8 | 16 | 60 | Cylindrical |
| TEC080A4-19C08-60 | ● | 8 | 8 | 19 | 60 | Cylindrical |
| TEC090A4-19C10-70 | ● | 9 | 10 | 19 | 70 | Cylindrical |
| TEC100A4-22C10-70 | ● | 10 | 10 | 22 | 70 | Cylindrical |
| TEC120A4-26C12-75 | ● | 12 | 12 | 26 | 75 | Cylindrical |
| TEC140A4-26C14-85 | ● | 14 | 14 | 26 | 85 | Cylindrical |
| TEC160A4-32C16-100 | ● | 16 | 16 | 32 | 100 | Cylindrical |
| TEC180A4-32C18-100 | ● | 18 | 18 | 32 | 100 | Cylindrical |
| TEC200A4-38C20-105 | ● | 20 | 20 | 38 | 105 | Cylindrical |



## TECH**B6...

6 flutes endmill, 45° helix, medium length for finishing hardened steels, for materials up to 65 HRC



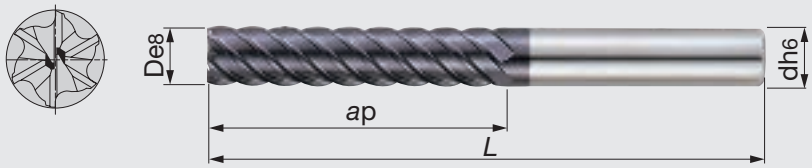

| Designation | AH750 | D | *d* | *ap* | *L* | Shank |
|---|---|---|---|---|---|---|
| TECH060B6-16C06-57 | ● | 6 | 6 | 16 | 57 | Cylindrical |
| TECH080B6-20C08-63 | ● | 8 | 8 | 20 | 63 | Cylindrical |
| TECH100B6-22C10-72 | ● | 10 | 10 | 22 | 72 | Cylindrical |
| TECH120B6-25C12-83 | ● | 12 | 12 | 25 | 83 | Cylindrical |
| TECH160B6-32C16-92 | ● | 16 | 16 | 32 | 92 | Cylindrical |
| TECH200B6-38C20-104 | ● | 20 | 20 | 38 | 104 | Cylindrical |

●: Line-up

## TEC**B6...

6 flutes, 45° helix, extra long length, for materials up to 65 HRC

H Hard Materials

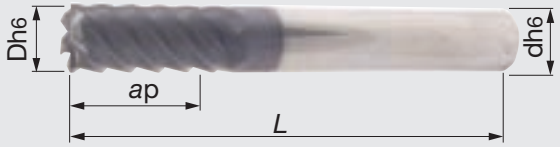



| Designation | AH750 | D | *d* | *ap* | *L* | Shank |
|---|---|---|---|---|---|---|
| TEC060B6-26C06-70 | ● | 6 | 6 | 26 | 70 | Cylindrical |
| TEC080B6-36C08-90 | ● | 8 | 8 | 36 | 90 | Cylindrical |
| TEC100B6-46C10-100 | ● | 10 | 10 | 46 | 100 | Cylindrical |
| TEC120B6-56C12-110 | ● | 12 | 12 | 56 | 110 | Cylindrical |
| TEC160B6-66C16-130 | ● | 16 | 16 | 66 | 130 | Cylindrical |
| TEC200B6-76C20-140 | ● | 20 | 20 | 76 | 140 | Cylindrical |
| TEC250B6-92C25-180 | ● | 25 | 25 | 92 | 180 | Cylindrical |

## TEC**D6...

6 flutes endmill, 50° helix, medium length, for materials up to 65 HRC

H Hard Materials



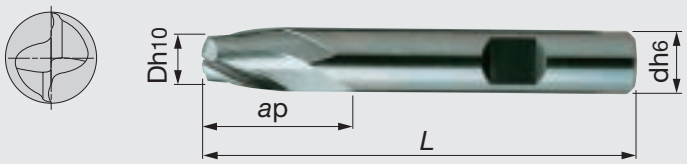

| Designation | AH750 | D | *d* | *ap* | *L* | Shank |
|---|---|---|---|---|---|---|
| TEC060D6-13C06H57 | ● | 6 | 6 | 13 | 57 | Cylindrical |
| TEC080D6-20C08H63 | ● | 8 | 8 | 20 | 63 | Cylindrical |
| TEC100D6-22C10H72 | ● | 10 | 10 | 22 | 72 | Cylindrical |
| TEC120D6-25C12H83 | ● | 12 | 12 | 25 | 83 | Cylindrical |
| TEC140D6-30C14H83 | ● | 14 | 14 | 30 | 83 | Cylindrical |
| TEC160D6-32C16H92 | ● | 16 | 16 | 32 | 92 | Cylindrical |
| TEC200D6-38C20H104 | ● | 20 | 20 | 38 | 104 | Cylindrical |



●: Line-up

# TEC**A2...

2 flutes, 30° helix, short cutting length



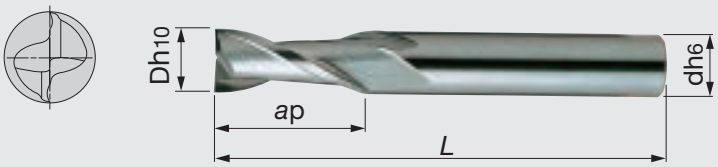

| Designation | AH725 | D | *d* | *ap* | *L* | Shank |
|---|---|---|---|---|---|---|
| TEC020A2-03W06-E50 | ● | 2 | 6 | 3 | 50 | Weldon |
| TEC030A2-04W06-E50 | ● | 3 | 6 | 4 | 50 | Weldon |
| TEC035A2-04W06-E50 | ● | 3.5 | 6 | 4 | 50 | Weldon |
| TEC040A2-05W06-E54 | ● | 4 | 6 | 5 | 54 | Weldon |
| TEC045A2-05W06-E54 | ● | 4.5 | 6 | 5 | 54 | Weldon |
| TEC050A2-06W06-E54 | ● | 5 | 6 | 6 | 54 | Weldon |
| TEC060A2-07W06-E54 | ● | 6 | 6 | 7 | 54 | Weldon |
| TEC070A2-08W08-E58 | ● | 7 | 8 | 8 | 58 | Weldon |
| TEC080A2-09W08-E58 | ● | 8 | 8 | 9 | 58 | Weldon |
| TEC090A2-10W10-E66 | ● | 9 | 10 | 10 | 66 | Weldon |
| TEC100A2-11W10-E66 | ● | 10 | 10 | 11 | 66 | Weldon |
| TEC120A2-12W12-E73 | ● | 12 | 12 | 12 | 73 | Weldon |
| TEC140A2-14W14-E75 | ● | 14 | 14 | 14 | 75 | Weldon |
| TEC160A2-16W16-E82 | ● | 16 | 16 | 16 | 82 | Weldon |
| TEC180A2-18W18-E84 | ● | 18 | 18 | 18 | 84 | Weldon |
| TEC200A2-20W20-E92 | ● | 20 | 20 | 20 | 92 | Weldon |



●: Line-up

## TEC**A2...

2 flutes, medium length, 30° helix



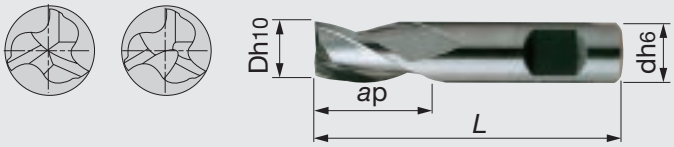

| Designation | AH725 | D | *d* | *ap* | *L* | Shank |
|---|---|---|---|---|---|---|
| TEC010A2-03C04-E50 | ● | 1 | 4 | 3 | 50 | Cylindrical |
| TEC015A2-045C04-E50 | ● | 1.5 | 4 | 4.5 | 50 | Cylindrical |
| TEC020A2-08C02-E32 | ● | 2 | 2 | 8 | 32 | Cylindrical |
| TEC025A2-08C025-E32 | ● | 2.5 | 2.5 | 8 | 32 | Cylindrical |
| TEC030A2-12C03-E38 | ● | 3 | 3 | 12 | 38 | Cylindrical |
| TEC035A2-12C035-E32 | ● | 3.5 | 3.5 | 12 | 32 | Cylindrical |
| TEC040A2-12C04-E50 | ● | 4 | 4 | 12 | 50 | Cylindrical |
| TEC045A2-14C045-E50 | ● | 4.5 | 4.5 | 14 | 50 | Cylindrical |
| TEC050A2-14C05-E50 | ● | 5 | 5 | 14 | 50 | Cylindrical |
| TEC055A2-16C055-E50 | ● | 5.5 | 5.5 | 16 | 50 | Cylindrical |
| TEC060A2-16C06-E50 | ● | 6 | 6 | 16 | 50 | Cylindrical |
| TEC070A2-20C07-E60 | ● | 7 | 7 | 20 | 60 | Cylindrical |
| TEC080A2-20C08-E63 | ● | 8 | 8 | 20 | 63 | Cylindrical |
| TEC090A2-20C09-E60 | ● | 9 | 9 | 20 | 60 | Cylindrical |
| TEC100A2-22C10-E72 | ● | 10 | 10 | 22 | 72 | Cylindrical |
| TEC120A2-22C12-E70 | ● | 12 | 12 | 22 | 70 | Cylindrical |
| TEC140A2-25C14-E75 | ● | 14 | 14 | 25 | 75 | Cylindrical |
| TEC160A2-25C16-E75 | ● | 16 | 16 | 25 | 75 | Cylindrical |
| TEC200A2-32C20-E100 | ● | 20 | 20 | 32 | 100 | Cylindrical |



●: Line-up

## TEC**A3..., TEC**E3...

3 flutes, 30° and 38° helix, short length

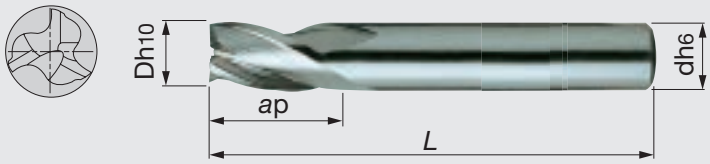



| Designation | AH725 | D | *d* | $a_p$ | *L* | Helix | Shank |
|---|---|---|---|---|---|---|---|
| TEC020E3-04C06-E35 | ● | 2 | 6 | 4 | 35 | 38 | Cylindrical |
| TEC025E3-05C06-E36 | ● | 2.5 | 6 | 5 | 36 | 38 | Cylindrical |
| TEC030E3-05C06-E36 | ● | 3 | 6 | 5 | 36 | 38 | Cylindrical |
| TEC035A3-06W06-E37 | ● | 3.5 | 6 | 6 | 37 | 30 | Weldon |
| TEC040E3-07C06-E38 | ● | 4 | 6 | 7 | 38 | 38 | Cylindrical |
| TEC045A3-08W06-E38 | ● | 4.5 | 6 | 8 | 38 | 30 | Weldon |
| TEC050A3-08C06-E39 | ● | 5 | 6 | 8 | 39 | 30 | Cylindrical |
| TEC055A3-08W06-E39 | ● | 5.5 | 6 | 8 | 39 | 30 | Weldon |
| TEC060E3-08C06-E39 | ● | 6 | 6 | 8 | 39 | 38 | Cylindrical |
| TEC070A3-10W08-E42 | ● | 7 | 8 | 10 | 42 | 30 | Weldon |
| TEC080E3-11C08-E43 | ● | 8 | 8 | 11 | 43 | 38 | Cylindrical |
| TEC090A3-11W10-E48 | ● | 9 | 10 | 11 | 48 | 30 | Weldon |
| TEC100E3-13C10-E50 | ● | 10 | 10 | 13 | 50 | 38 | Cylindrical |
| TEC120A3-15C12-E55 | ● | 12 | 12 | 15 | 55 | 30 | Cylindrical |



## TEC**A3..., TEC**E3...

3 flutes, 30° and 38° helix, medium length

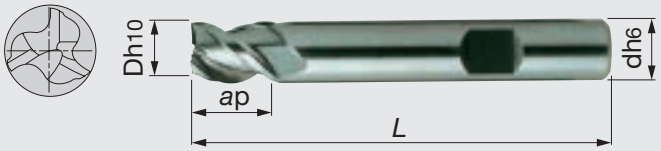



| Designation | AH725 | D | *d* | $a_p$ | *L* | Helix | Shank |
|---|---|---|---|---|---|---|---|
| TEC020E3-08C02-E32 | ● | 2 | 2 | 8 | 32 | 38 | Cylindrical |
| TEC030E3-12C03-E38 | ● | 3 | 3 | 12 | 38 | 38 | Cylindrical |
| TEC040E3-12C04-E50 | ● | 4 | 4 | 12 | 50 | 38 | Cylindrical |
| TEC050E3-14C05-E50 | ● | 5 | 5 | 14 | 50 | 38 | Cylindrical |
| TEC060E3-16C06-E50 | ● | 6 | 6 | 16 | 50 | 38 | Cylindrical |
| TEC070E3-20C07-E60 | ● | 7 | 7 | 20 | 60 | 38 | Cylindrical |
| TEC080E3-20C08-E63 | ● | 8 | 8 | 20 | 63 | 38 | Cylindrical |
| TEC090A3-20C09-E60 | ● | 9 | 9 | 20 | 60 | 30 | Cylindrical |
| TEC100E3-22C10-E72 | ● | 10 | 10 | 22 | 72 | 38 | Cylindrical |
| TEC120E3-22C12-E73 | ● | 12 | 12 | 22 | 73 | 38 | Cylindrical |
| TEC140A3-25C14-E75 | ● | 14 | 14 | 25 | 75 | 30 | Cylindrical |
| TEC160A3-25C16-E75 | ● | 16 | 16 | 25 | 75 | 30 | Cylindrical |
| TEC200E3-32C20-E104 | ● | 20 | 20 | 32 | 104 | 38 | Cylindrical |

●: Line-up

## TEC**B3-**W...

3 flutes, 45° helix, short length



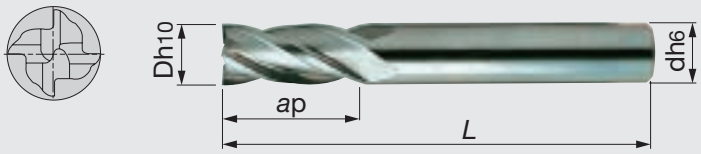

| Designation | AH725 | D | *d* | $a_p$ | *L* | Shank |
|---|---|---|---|---|---|---|
| TEC020B3-03W06-50 | ● | 2 | 6 | 3 | 50 | Weldon |
| TEC030B3-04W06-50 | ● | 3 | 6 | 4 | 50 | Weldon |
| TEC040B3-05W06-54 | ● | 4 | 6 | 5 | 54 | Weldon |
| TEC050B3-06W06-54 | ● | 5 | 6 | 6 | 54 | Weldon |
| TEC060B3-07W06-54 | ● | 6 | 6 | 7 | 54 | Weldon |
| TEC080B3-09W08-58 | ● | 8 | 8 | 9 | 58 | Weldon |
| TEC100B3-11W10-66 | ● | 10 | 10 | 11 | 66 | Weldon |
| TEC120B3-12W12-73 | ● | 12 | 12 | 12 | 73 | Weldon |
| TEC140B3-14W14-75 | ● | 14 | 14 | 14 | 75 | Weldon |
| TEC160B3-16W16-82 | ● | 16 | 16 | 16 | 82 | Weldon |
| TEC180B3-18W18-84 | ● | 18 | 18 | 18 | 84 | Weldon |
| TEC200B3-20W20-92 | ● | 20 | 20 | 20 | 92 | Weldon |



●: Line-up

## TEC**A4-**C**-E...

4 flutes, 30° helix, medium length

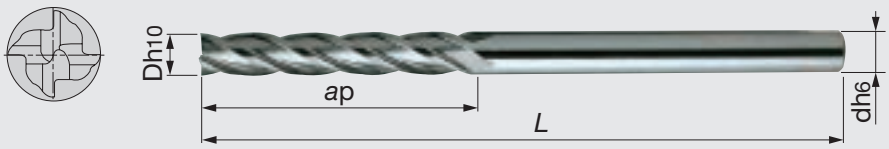



| Designation | AH725 | D | *d* | $a_p$ | *L* | Shank |
|---|---|---|---|---|---|---|
| TEC020A4-08C02-E32 | ● | 2 | 2 | 8 | 32 | Cylindrical |
| TEC025A4-08C025-E32 | ● | 2.5 | 2.5 | 8 | 32 | Cylindrical |
| TEC030A4-12C03-E32 | ● | 3 | 3 | 12 | 32 | Cylindrical |
| TEC035A4-12C035-E32 | ● | 3.5 | 3.5 | 12 | 32 | Cylindrical |
| TEC040A4-12C04-E50 | ● | 4 | 4 | 12 | 50 | Cylindrical |
| TEC045A4-14C045-E50 | ● | 4.5 | 4.5 | 14 | 50 | Cylindrical |
| TEC050A4-14C05-E50 | ● | 5 | 5 | 14 | 50 | Cylindrical |
| TEC055A4-16C055-E50 | ● | 5.5 | 5.5 | 16 | 50 | Cylindrical |
| TEC060A4-16C06-E50 | ● | 6 | 6 | 16 | 50 | Cylindrical |
| TEC070A4-20C07-E60 | ● | 7 | 7 | 20 | 60 | Cylindrical |
| TEC080A4-20C08-E60 | ● | 8 | 8 | 20 | 60 | Cylindrical |
| TEC090A4-20C09-E60 | ● | 9 | 9 | 20 | 60 | Cylindrical |
| TEC100A4-22C10-E72 | ● | 10 | 10 | 22 | 72 | Cylindrical |
| TEC120A4-22C12-E70 | ● | 12 | 12 | 22 | 70 | Cylindrical |
| TEC140A4-25C14-E75 | ● | 14 | 14 | 25 | 75 | Cylindrical |
| TEC160A4-25C16-E75 | ● | 16 | 16 | 25 | 75 | Cylindrical |
| TEC200A4-32C20-E100 | ● | 20 | 20 | 32 | 100 | Cylindrical |



## TEC**A4-**C**-E...

4 flutes, 30° helix, extra long



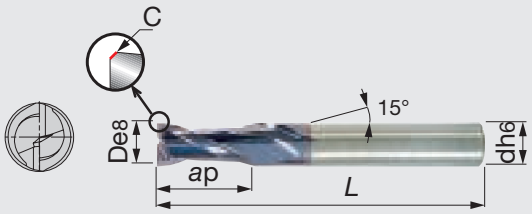

| Designation | AH725 | D | *d* | $a_p$ | *L* | Shank |
|---|---|---|---|---|---|---|
| TEC030A4-30C03-E75 | ● | 3 | 3 | 30 | 75 | Cylindrical |
| TEC040A4-30C04-E75 | ● | 4 | 4 | 30 | 75 | Cylindrical |
| TEC050A4-40C05-E100 | ● | 5 | 5 | 40 | 100 | Cylindrical |
| TEC060A4-50C06-E150 | ● | 6 | 6 | 50 | 150 | Cylindrical |
| TEC080A4-50C08-E150 | ● | 8 | 8 | 50 | 150 | Cylindrical |
| TEC100A4-60C10-E150 | ● | 10 | 10 | 60 | 150 | Cylindrical |
| TEC120A4-75C12-E150 | ● | 12 | 12 | 75 | 150 | Cylindrical |
| TEC140A4-65C14-E150 | ● | 14 | 14 | 65 | 150 | Cylindrical |
| TEC160A4-65C16-E150 | ● | 16 | 16 | 65 | 150 | Cylindrical |
| TEC200A4-65C20-E150 | ● | 20 | 20 | 65 | 150 | Cylindrical |

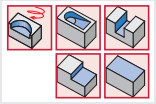
●: Line-up

## TECC**A2..., TECC**B2...

2 flutes slot drill, 30° and 45° helix, medium length

| øD | C |
|---|---|
| D≤4 | 0.1x45° |
| 4< D≤10 | 0.15x45° |
| 10< D | 0.25x45° |



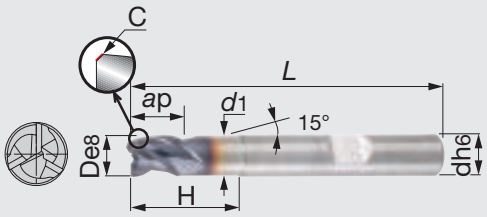



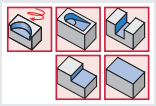
| Designation | AH725 | D | *d* | $a_p$ | *L* | Helix | Shank |
|---|---|---|---|---|---|---|---|
| TECC020B2-07C03-38 | ● | 2 | 3 | 7 | 38 | 45° | Cylindrical |
| TECC030A2-10C03-38 | ● | 3 | 3 | 10 | 38 | 30° | Cylindrical |
| TECC040A2-12C04-50 | ● | 4 | 4 | 12 | 50 | 30° | Cylindrical |
| TECC050A2-14C05-50 | ● | 5 | 5 | 14 | 50 | 30° | Cylindrical |
| TECC060A2-16C06-57 | ● | 6 | 6 | 16 | 57 | 30° | Cylindrical |
| TECC080A2-20C08-63 | ● | 8 | 8 | 20 | 63 | 30° | Cylindrical |
| TECC100A2-22C10-72 | ● | 10 | 10 | 22 | 72 | 30° | Cylindrical |
| TECC120A2-25C12-83 | ● | 12 | 12 | 25 | 83 | 30° | Cylindrical |
| TECC160A2-32C16-92 | ● | 16 | 16 | 32 | 92 | 30° | Cylindrical |
| TECC200A2-38C20-104 | ● | 20 | 20 | 38 | 104 | 30° | Cylindrical |

## TECS**E3..., TECCS**E3...

3 flutes slot drill, 38° helix, short length

| øD | C |
|---|---|
| D≤4 | 0.1x45° |
| 4< D≤10 | 0.15x45° |
| D>10 | 0.25x45° |



| Designation | AH725 | D | *d* | $d_1$ | $a_p$ | H | *L* | Shank |
|---|---|---|---|---|---|---|---|---|
| TECS020E3-03W06-57 | ● | 2 | 6 | 1.9 | 3 | 7 | 57 | Weldon |
| TECS030E3-04W06-57 | ● | 3 | 6 | 2.9 | 4 | 10 | 57 | Weldon |
| TECS040E3-05W06-57 | ● | 4 | 6 | 3.9 | 5 | 12 | 57 | Weldon |
| TECS050E3-06W06-57 | ● | 5 | 6 | 4.9 | 6 | 14 | 57 | Weldon |
| TECCS060E3-07W06-57 | ● | 6 | 6 | 5.9 | 7 | 16 | 57 | Weldon |
| TECCS080E3-09W08-63 | ● | 8 | 8 | 7.6 | 9 | 20 | 63 | Weldon |
| TECCS100E3-11W10-72 | ● | 10 | 10 | 9.5 | 11 | 22 | 72 | Weldon |
| TECCS120E3-12W12-83 | ● | 12 | 12 | 11.3 | 12 | 25 | 83 | Weldon |
| TECCS160E3-16W16-92 | ● | 16 | 16 | 15.2 | 16 | 32 | 92 | Weldon |
| TECCS200E3-20W20-104 | ● | 20 | 20 | 19 | 20 | 38 | 104 | Weldon |

**Due to short and stable design, feed can be increased by 25%.**

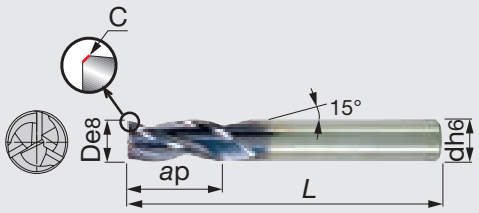


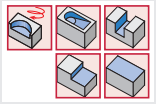
●: Line-up

# TECC**B3..., TECC**E3...

3 flutes slot drill, 38° and 45° helix, medium length

| øD | C |
|---|---|
| D≤4 | 0.1x45° |
| 4< D≤10 | 0.15x45° |
| 10< D | 0.25x45° |



| Designation | AH725 | D | *d* | $a_p$ | *L* | Helix | Shank |
|---|---|---|---|---|---|---|---|
| TECC020B3-07C03-38 | ● | 2 | 3 | 7 | 38 | 45° | Cylindrical |
| TECC030E3-10C03-38 | ● | 3 | 3 | 10 | 38 | 38° | Cylindrical |
| TECC040E3-12C04-50 | ● | 4 | 4 | 12 | 50 | 38° | Cylindrical |
| TECC050E3-14C05-50 | ● | 5 | 5 | 14 | 50 | 38° | Cylindrical |
| TECC060E3-16C06-57 | ● | 6 | 6 | 16 | 57 | 38° | Cylindrical |
| TECC080E3-20C08-63 | ● | 8 | 8 | 20 | 63 | 38° | Cylindrical |
| TECC100E3-22C10-72 | ● | 10 | 10 | 22 | 72 | 38° | Cylindrical |
| TECC120E3-25C12-83 | ● | 12 | 12 | 25 | 83 | 38° | Cylindrical |
| TECC160E3-32C16-92 | ● | 16 | 16 | 32 | 92 | 38° | Cylindrical |
| TECC200E3-38C20-104 | ● | 20 | 20 | 38 | 104 | 38° | Cylindrical |

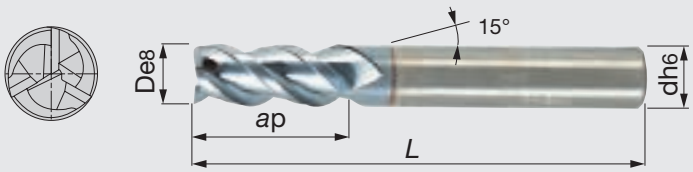
Multi-purpose endmills.
Also suitable for deep slotting.



●: Line-up

## TEC**B3-**C...

3 flutes slot drill, 45° helix, medium length



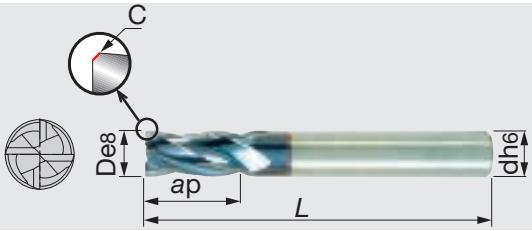

| Designation | AH725 | D | d | ap | L | Shank |
|---|---|---|---|---|---|---|
| TEC020B3-07C06-57 | ● | 2 | 6 | 7 | 57 | Cylindrical |
| TEC030B3-10C06-57 | ● | 3 | 6 | 10 | 57 | Cylindrical |
| TEC040B3-12C06-57 | ● | 4 | 6 | 12 | 57 | Cylindrical |
| TEC050B3-14C06-57 | ● | 5 | 6 | 14 | 57 | Cylindrical |
| TEC060B3-16C06-57 | ● | 6 | 6 | 16 | 57 | Cylindrical |
| TEC070B3-16C07-60 | ● | 7 | 7 | 16 | 60 | Cylindrical |
| TEC080B3-20C08-63 | ● | 8 | 8 | 20 | 63 | Cylindrical |
| TEC090B3-20C09-67 | ● | 9 | 9 | 20 | 67 | Cylindrical |
| TEC100B3-22C10-72 | ● | 10 | 10 | 22 | 72 | Cylindrical |
| TEC120B3-25C12-83 | ● | 12 | 12 | 25 | 83 | Cylindrical |
| TEC140B3-25C14-75 | ● | 14 | 14 | 25 | 75 | Cylindrical |
| TEC160B3-32C16-92 | ● | 16 | 16 | 32 | 92 | Cylindrical |
| TEC180B3-32C18-92 | ● | 18 | 18 | 32 | 92 | Cylindrical |
| TEC200B3-38C20-104 | ● | 20 | 20 | 38 | 104 | Cylindrical |

Excellent for deep slotting and shoulder milling.

## TECC**A4..., TECC**B4...

4 flutes endmill, 30° and 45° helix, medium length

| øD | C |
|---|---|
| D≤4 | 0.1x45° |
| 4< D≤10 | 0.15x45° |
| 10< D | 0.25x45° |



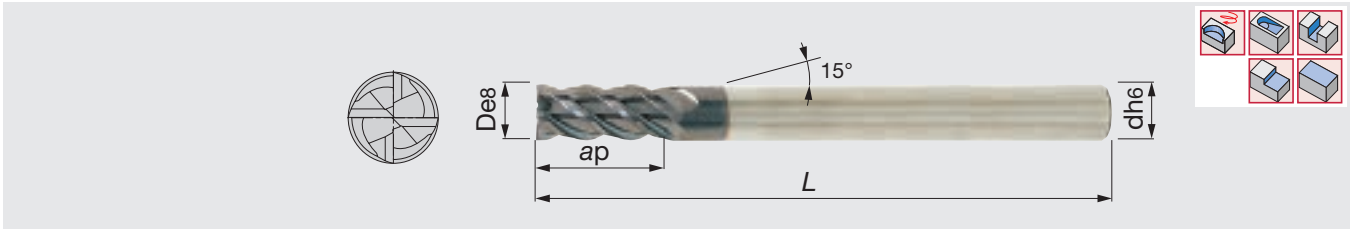

| Designation | AH725 | D | d | ap | L | Helix | Shank |
|---|---|---|---|---|---|---|---|
| TECC020B4-07C03-38 | ● | 2 | 3 | 7 | 38 | 45 | Cylindrical |
| TECC030A4-10C03-38 | ● | 3 | 3 | 10 | 38 | 30 | Cylindrical |
| TECC040A4-12C04-50 | ● | 4 | 4 | 12 | 50 | 30 | Cylindrical |
| TECC050A4-14C05-50 | ● | 5 | 5 | 14 | 50 | 30 | Cylindrical |
| TECC060A4-16C06-57 | ● | 6 | 6 | 16 | 57 | 30 | Cylindrical |
| TECC080A4-20C08-63 | ● | 8 | 8 | 20 | 63 | 30 | Cylindrical |
| TECC100A4-22C10-72 | ● | 10 | 10 | 22 | 72 | 30 | Cylindrical |
| TECC120A4-25C12-83 | ● | 12 | 12 | 25 | 83 | 30 | Cylindrical |
| TECC160A4-32C16-92 | ● | 16 | 16 | 32 | 92 | 30 | Cylindrical |
| TECC200A4-38C20-104 | ● | 20 | 20 | 38 | 104 | 30 | Cylindrical |



●: Line-up

## TEC**B4...

4 flutes endmill, 45° helix, medium length



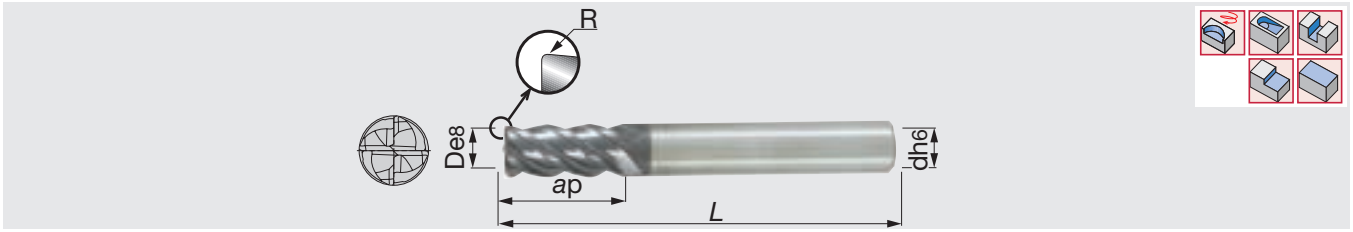

| Designation | AH725 | D | *d* | $a_p$ | *L* | Shank |
|---|---|---|---|---|---|---|
| TEC020B4-07C06-57 | ● | 2 | 6 | 7 | 57 | Cylindrical |
| TEC030B4-10C06-57 | ● | 3 | 6 | 10 | 57 | Cylindrical |
| TEC040B4-12C06-57 | ● | 4 | 6 | 12 | 57 | Cylindrical |
| TEC050B4-14C06-57 | ● | 5 | 6 | 14 | 57 | Cylindrical |
| TEC060B4-16C06-57 | ● | 6 | 6 | 16 | 57 | Cylindrical |
| TEC080B4-20C08-63 | ● | 8 | 8 | 20 | 63 | Cylindrical |
| TEC100B4-22C10-72 | ● | 10 | 10 | 22 | 72 | Cylindrical |
| TEC120B4-25C12-83 | ● | 12 | 12 | 25 | 83 | Cylindrical |
| TEC140B4-25C14-83 | ● | 14 | 14 | 25 | 83 | Cylindrical |
| TEC160B4-32C16-92 | ● | 16 | 16 | 32 | 92 | Cylindrical |
| TEC180B4-32C18-92 | ● | 18 | 18 | 32 | 92 | Cylindrical |
| TEC200B4-38C20-104 | ● | 20 | 20 | 38 | 104 | Cylindrical |



●: Line-up

## TEC**B4-**R...

4 flutes endmill with radius corner, 45° helix, medium length




| Designation | AH725 | D | *d* | R | *ap* | *L* | Shank |
|---|---|---|---|---|---|---|---|
| TEC060B4-16C06R05-57 | ● | 6 | 6 | 0.5 | 16 | 57 | Cylindrical |
| TEC060B4-16C06R1-57 | ● | 6 | 6 | 1 | 16 | 57 | Cylindrical |
| TEC080B4-20C08R05-63 | ● | 8 | 8 | 0.5 | 20 | 63 | Cylindrical |
| TEC080B4-20C08R1-63 | ● | 8 | 8 | 1 | 20 | 63 | Cylindrical |
| TEC080B4-20C08R15-63 | ● | 8 | 8 | 1.5 | 20 | 63 | Cylindrical |
| TEC080B4-20C08R2-63 | ● | 8 | 8 | 2 | 20 | 63 | Cylindrical |
| TEC100B4-22C10R05-72 | ● | 10 | 10 | 0.5 | 22 | 72 | Cylindrical |
| TEC100B4-22C10R1-72 | ● | 10 | 10 | 1 | 22 | 72 | Cylindrical |
| TEC100B4-22C10R15-72 | ● | 10 | 10 | 1.5 | 22 | 72 | Cylindrical |
| TEC100B4-22C10R2-72 | ● | 10 | 10 | 2 | 22 | 72 | Cylindrical |
| TEC100B4-22C10R3-72 | ● | 10 | 10 | 3 | 22 | 72 | Cylindrical |
| TEC120B4-25C12R05-83 | ● | 12 | 12 | 0.5 | 25 | 83 | Cylindrical |
| TEC120B4-25C12R1-83 | ● | 12 | 12 | 1 | 25 | 83 | Cylindrical |
| TEC120B4-25C12R15-83 | ● | 12 | 12 | 1.5 | 25 | 83 | Cylindrical |
| TEC120B4-25C12R2-83 | ● | 12 | 12 | 2 | 25 | 83 | Cylindrical |
| TEC120B4-25C12R3-83 | ● | 12 | 12 | 3 | 25 | 83 | Cylindrical |
| TEC160B4-32C16R05-92 | ● | 16 | 16 | 0.5 | 32 | 92 | Cylindrical |
| TEC160B4-32C16R1-92 | ● | 16 | 16 | 1 | 32 | 92 | Cylindrical |
| TEC160B4-32C16R2-92 | ● | 16 | 16 | 2 | 32 | 92 | Cylindrical |
| TEC160B4-32C16R3-92 | ● | 16 | 16 | 3 | 32 | 92 | Cylindrical |
| TEC200B4-38C20R05-104 | ● | 20 | 20 | 0.5 | 38 | 104 | Cylindrical |
| TEC200B4-38C20R1-104 | ● | 20 | 20 | 1 | 38 | 104 | Cylindrical |
| TEC200B4-38C20R2-104 | ● | 20 | 20 | 2 | 38 | 104 | Cylindrical |
| TEC200B4-38C20R3-104 | ● | 20 | 20 | 3 | 38 | 104 | Cylindrical |
| TEC200B4-38C20R4-104 | ● | 20 | 20 | 4 | 38 | 104 | Cylindrical |

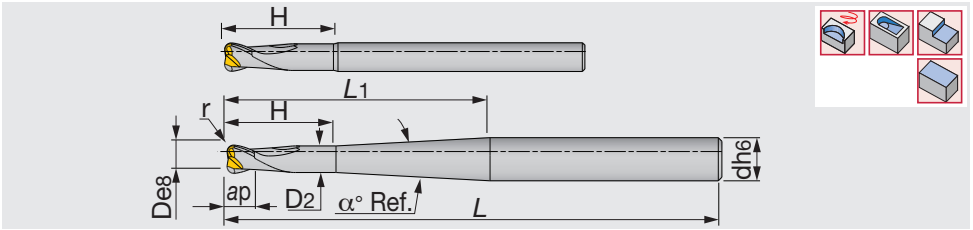


●: Line-up

## TETR**A2-**R...

2 flutes toroidal endmills





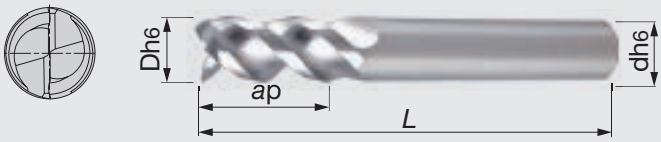

| Designation | AH725 | D | *d* | *D*2 | r | *a*p | H | *L*1 | α° | L | Shank |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TETR020A2-2/08C06R05M80 | ● | 2 | 6 | 1.9 | 0.5 | 2 | 8 | 40 | 3.6 | 80 | Cylindrical |
| TETR030A2-2/12C06R05M80 | ● | 3 | 6 | 2.8 | 0.5 | 2 | 12 | 40 | 3.3 | 80 | Cylindrical |
| TETR040A2-3/16C06R1M80 | ● | 4 | 6 | 3.7 | 1 | 3 | 16 | 40 | 2.8 | 80 | Cylindrical |
| TETR060A2-4/25C06R2M80 | ● | 6 | 6 | 5.6 | 2 | 4 | 25 | - | 0 | 80 | Cylindrical |
| TETR060A2-4/25C08R2M100 | ● | 6 | 8 | 5.6 | 2 | 4 | 25 | 66 | 2.0 | 100 | Cylindrical |
| TETR080A2-4/32C08R2M100 | ● | 7 | 8 | 7.6 | 2 | 4 | 32 | - | 0 | 100 | Cylindrical |
| TETR080A2-4/32C10R2M120 | ● | 7 | 10 | 7.6 | 2 | 4 | 32 | 66 | 2.0 | 120 | Cylindrical |
| TETR100A2-6/40C10R3M120 | ● | 10 | 10 | 9.6 | 3 | 6 | 40 | - | 0 | 120 | Cylindrical |
| TETR100A2-6/40C12R3M158 | ● | 10 | 12 | 9.6 | 3 | 6 | 40 | 110 | 1.0 | 158 | Cylindrical |

## TECA**B2...

2 flutes aluminium slot drill, 45° helix, medium length



N
Non-ferrous




| Designation | KS15F | D | *d* | *a*p | *L* | Shank |
|---|---|---|---|---|---|---|
| TECA040B2-12C06-57 | ● | 4 | 6 | 12 | 57 | Cylindrical |
| TECA050B2-14C06-57 | ● | 5 | 6 | 14 | 57 | Cylindrical |
| TECA060B2-16C06-57 | ● | 6 | 6 | 16 | 57 | Cylindrical |
| TECA080B2-20C08-63 | ● | 8 | 8 | 20 | 63 | Cylindrical |
| TECA100B2-22C10-72 | ● | 10 | 10 | 22 | 72 | Cylindrical |
| TECA120B2-25C12-83 | ● | 12 | 12 | 25 | 83 | Cylindrical |
| TECA160B2-32C16-92 | ● | 16 | 16 | 32 | 92 | Cylindrical |
| TECA200B2-38C20-104 | ● | 20 | 20 | 38 | 104 | Cylindrical |

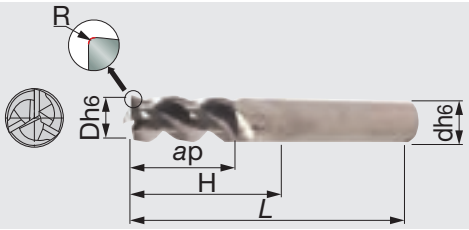
Special design for aluminium

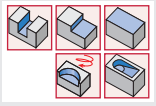
●: Line-up

## TECA**H3-**CF-R...

Solid carbide endmills for aluminium, center cutting, 3 flutes, 39 - 41° variable helix for chatter dampening

N
Non-ferrous



| Designation | KS15F | D | *d* | R | *ap* | H | *L* | Shank |
|---|---|---|---|---|---|---|---|---|
| TECA030H3-07/12C06CF-R01 | ● | 3 | 6 | 0.1 | 7 | 12 | 57 | Cylindrical |
| TECA040H3-10/16C06CF-R02 | ● | 4 | 6 | 0.2 | 10 | 16 | 57 | Cylindrical |
| TECA050H3-12/20C06CF-R02 | ● | 5 | 6 | 0.2 | 12 | 20 | 57 | Cylindrical |
| TECA060H3-09/18C06CF-R02 | ● | 6 | 6 | 0.2 | 9 | 18 | 57 | Cylindrical |
| TECA060H3-09/18C06CF-R04 | ● | 6 | 6 | 0.4 | 9 | 18 | 57 | Cylindrical |
| TECA060H3-09/18C06CF-R08 | ● | 6 | 6 | 0.8 | 9 | 18 | 57 | Cylindrical |
| TECA080H3-12/24C08CF-R02 | ● | 8 | 8 | 0.2 | 12 | 24 | 63 | Cylindrical |
| TECA080H3-12/24C08CF-R04 | ● | 8 | 8 | 0.4 | 12 | 24 | 63 | Cylindrical |
| TECA080H3-12/24C08CF-R08 | ● | 8 | 8 | 0.8 | 12 | 24 | 63 | Cylindrical |
| TECA100H3-15/30C10CF-R02 | ● | 10 | 10 | 0.2 | 15 | 30 | 72 | Cylindrical |
| TECA100H3-15/30C10CF-R04 | ● | 10 | 10 | 0.4 | 15 | 30 | 72 | Cylindrical |
| TECA100H3-15/30C10CF-R08 | ● | 10 | 10 | 0.8 | 15 | 30 | 72 | Cylindrical |
| TECA120H3-18/36C12CF-R02 | ● | 12 | 12 | 0.2 | 18 | 36 | 83 | Cylindrical |
| TECA120H3-18/36C12CF-R04 | ● | 12 | 12 | 0.4 | 18 | 36 | 83 | Cylindrical |
| TECA120H3-18/36C12CF-R08 | ● | 12 | 12 | 0.8 | 18 | 36 | 83 | Cylindrical |
| TECA120H3-18/36C12CF-R16 | ● | 12 | 12 | 1.6 | 18 | 36 | 83 | Cylindrical |
| TECA160H3-24/48C16CF-R02 | ● | 16 | 16 | 0.2 | 24 | 48 | 92 | Cylindrical |
| TECA160H3-24/48C16CF-R04 | ● | 16 | 16 | 0.4 | 24 | 48 | 92 | Cylindrical |
| TECA160H3-24/48C16CF-R08 | ● | 16 | 16 | 0.8 | 24 | 48 | 92 | Cylindrical |
| TECA160H3-24/48C16CF-R16 | ● | 16 | 16 | 1.6 | 24 | 48 | 92 | Cylindrical |
| TECA160H3-24/48C16CF-R20 | ● | 16 | 16 | 2 | 24 | 48 | 92 | Cylindrical |
| TECA200H3-30/60C20CF-R04 | ● | 20 | 20 | 0.4 | 30 | 60 | 110 | Cylindrical |
| TECA200H3-30/60C20CF-R08 | ● | 20 | 20 | 0.8 | 30 | 60 | 110 | Cylindrical |
| TECA200H3-30/60C20CF-R16 | ● | 20 | 20 | 1.6 | 30 | 60 | 110 | Cylindrical |
| TECA200H3-30/60C20CF-R20 | ● | 20 | 20 | 2 | 30 | 60 | 110 | Cylindrical |



●: Line-up

## TEBRF**T*-...

3, 4 flutes roughing ball nose, 20° helix long length for materials up to 55 HRC

H
Hard Materials




| Designation | AH750 | D | *d* | R | $a_p$ | *L* | z | Shank |
|---|---|---|---|---|---|---|---|---|
| TEBRF060T3-16C06M57 | ● | 6 | 6 | 3 | 16 | 57 | 3 | Cylindrical |
| TEBRF080T3-16C08M63 | ● | 8 | 8 | 4 | 16 | 63 | 3 | Cylindrical |
| TEBRF100T4-22C10M72 | ● | 10 | 10 | 5 | 22 | 72 | 4 | Cylindrical |
| TEBRF120T4-26C12M83 | ● | 12 | 12 | 6 | 26 | 83 | 4 | Cylindrical |
| TEBRF140T4-26C14M83 | ● | 14 | 14 | 7 | 26 | 83 | 4 | Cylindrical |
| TEBRF160T4-32C16M92 | ● | 16 | 16 | 8 | 32 | 92 | 4 | Cylindrical |
| TEBRF180T4-32C18M92 | ● | 18 | 18 | 9 | 32 | 92 | 4 | Cylindrical |
| TEBRF200T4-38C20M104 | ● | 20 | 20 | 10 | 38 | 104 | 4 | Cylindrical |



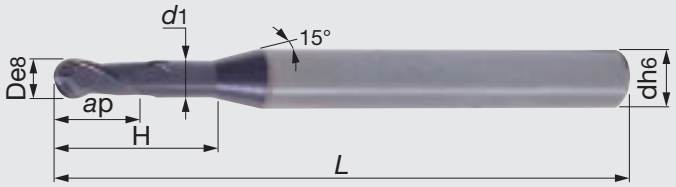
●: Line-up

## TEB**A2-**C**M...

2 flutes ball nose for rib processing, 30° helix for materials up to 65 HRC

H
Hard Materials






| Designation | AH750 | D | d | d1 | ap | H | L | Shank |
|---|---|---|---|---|---|---|---|---|
| TEB004A2-006/02C4M45 | ● | 0.4 | 4 | 0.36 | 0.6 | 2 | 45 | Cylindrical |
| TEB004A2-006/03C4M45 | ● | 0.4 | 4 | 0.36 | 0.6 | 3 | 45 | Cylindrical |
| TEB005A2-007/02C4M45 | ● | 0.5 | 4 | 0.45 | 0.7 | 2 | 45 | Cylindrical |
| TEB005A2-007/04C4M45 | ● | 0.5 | 4 | 0.45 | 0.7 | 4 | 45 | Cylindrical |
| TEB005A2-007/06C4M45 | ● | 0.5 | 4 | 0.45 | 0.7 | 6 | 45 | Cylindrical |
| TEB006A2-009/02C4M45 | ● | 0.6 | 4 | 0.55 | 0.9 | 2 | 45 | Cylindrical |
| TEB006A2-009/04C4M45 | ● | 0.6 | 4 | 0.55 | 0.9 | 4 | 45 | Cylindrical |
| TEB006A2-009/06C4M45 | ● | 0.6 | 4 | 0.55 | 0.9 | 6 | 45 | Cylindrical |
| TEB008A2-012/04C4M45 | ● | 0.8 | 4 | 0.75 | 1.2 | 4 | 45 | Cylindrical |
| TEB008A2-012/06C4M45 | ● | 0.8 | 4 | 0.75 | 1.2 | 6 | 45 | Cylindrical |
| TEB008A2-012/08C4M45 | ● | 0.8 | 4 | 0.75 | 1.2 | 8 | 45 | Cylindrical |
| TEB010A2-015/04C4M45 | ● | 1 | 4 | 0.97 | 1.5 | 4 | 45 | Cylindrical |
| TEB010A2-015/06C4M45 | ● | 1 | 4 | 0.97 | 1.5 | 6 | 45 | Cylindrical |
| TEB010A2-015/08C4M45 | ● | 1 | 4 | 0.95 | 1.5 | 8 | 45 | Cylindrical |
| TEB010A2-015/10C4M45 | ● | 1 | 4 | 0.95 | 1.5 | 10 | 45 | Cylindrical |
| TEB010A2-015/12C4M45 | ● | 1 | 4 | 0.93 | 1.5 | 12 | 45 | Cylindrical |
| TEB010A2-015/16C4M50 | ● | 1 | 4 | 0.93 | 1.5 | 16 | 50 | Cylindrical |
| TEB012A2-018/08C4M45 | ● | 1.2 | 4 | 1.17 | 1.8 | 8 | 45 | Cylindrical |
| TEB012A2-018/12C4M45 | ● | 1.2 | 4 | 1.13 | 1.8 | 12 | 45 | Cylindrical |
| TEB014A2-021/08C4M45 | ● | 1.4 | 4 | 1.35 | 2.1 | 8 | 45 | Cylindrical |
| TEB014A2-021/12C4M45 | ● | 1.4 | 4 | 1.33 | 2.1 | 12 | 45 | Cylindrical |
| TEB014A2-021/16C4M50 | ● | 1.4 | 4 | 1.31 | 2.1 | 16 | 50 | Cylindrical |
| TEB015A2-023/06C4M45 | ● | 1.5 | 4 | 1.47 | 2.3 | 6 | 45 | Cylindrical |
| TEB015A2-023/08C4M45 | ● | 1.5 | 4 | 1.45 | 2.3 | 8 | 45 | Cylindrical |
| TEB015A2-023/10C4M45 | ● | 1.5 | 4 | 1.45 | 2.3 | 10 | 45 | Cylindrical |
| TEB015A2-023/12C4M45 | ● | 1.5 | 4 | 1.43 | 2.3 | 12 | 45 | Cylindrical |
| TEB015A2-023/16C4M50 | ● | 1.5 | 4 | 1.41 | 2.3 | 16 | 50 | Cylindrical |
| TEB015A2-023/20C4M55 | ● | 1.5 | 4 | 1.39 | 2.3 | 20 | 55 | Cylindrical |
| TEB016A2-024/08C4M45 | ● | 1.6 | 4 | 1.55 | 2.4 | 8 | 45 | Cylindrical |
| TEB016A2-024/12C4M45 | ● | 1.6 | 4 | 1.53 | 2.4 | 12 | 45 | Cylindrical |
| TEB016A2-024/16C4M50 | ● | 1.6 | 4 | 1.51 | 2.4 | 16 | 50 | Cylindrical |
| TEB016A2-024/20C4M55 | ● | 1.6 | 4 | 1.49 | 2.4 | 20 | 55 | Cylindrical |



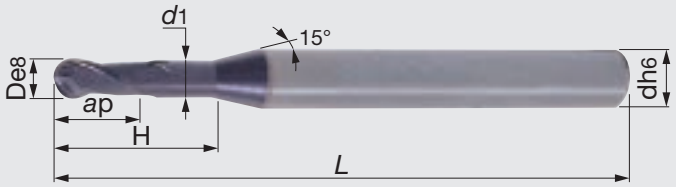
●: Line-up

## TEB**A2-**C**M...

2 flutes ball nose for rib processing, 30° helix for materials up to 65 HRC

H
Hard Materials






| Designation | AH750 | D | d | $d_1$ | $a_p$ | H | L | Shank |
|---|---|---|---|---|---|---|---|---|
| TEB018A2-027/08C4M45 | ● | 1.8 | 4 | 1.75 | 2.7 | 8 | 45 | Cylindrical |
| TEB018A2-027/12C4M45 | ● | 1.8 | 4 | 1.73 | 2.7 | 12 | 45 | Cylindrical |
| TEB018A2-027/16C4M50 | ● | 1.8 | 4 | 1.71 | 2.7 | 16 | 50 | Cylindrical |
| TEB018A2-027/20C4M55 | ● | 1.8 | 4 | 1.69 | 2.7 | 20 | 55 | Cylindrical |
| TEB020A2-030/06C4M45 | ● | 2 | 4 | 1.97 | 3 | 6 | 45 | Cylindrical |
| TEB020A2-030/10C4M45 | ● | 2 | 4 | 1.93 | 3 | 10 | 45 | Cylindrical |
| TEB020A2-030/12C4M50 | ● | 2 | 4 | 1.93 | 3 | 12 | 50 | Cylindrical |
| TEB020A2-030/16C4M50 | ● | 2 | 4 | 1.91 | 3 | 16 | 50 | Cylindrical |
| TEB020A2-030/20C4M55 | ● | 2 | 4 | 1.89 | 3 | 20 | 55 | Cylindrical |
| TEB020A2-030/30C4M70 | ● | 2 | 4 | 1.89 | 3 | 30 | 70 | Cylindrical |
| TEB030A2-045/08C6M50 | ● | 3 | 6 | 2.85 | 4.5 | 8 | 50 | Cylindrical |
| TEB030A2-045/10C6M50 | ● | 3 | 6 | 2.85 | 4.5 | 10 | 50 | Cylindrical |
| TEB030A2-045/12C6M50 | ● | 3 | 6 | 2.85 | 4.5 | 12 | 50 | Cylindrical |
| TEB030A2-045/16C6M55 | ● | 3 | 6 | 2.85 | 4.5 | 16 | 55 | Cylindrical |
| TEB030A2-045/20C6M60 | ● | 3 | 6 | 2.85 | 4.5 | 20 | 60 | Cylindrical |
| TEB030A2-045/30C6M70 | ● | 3 | 6 | 2.85 | 4.5 | 30 | 70 | Cylindrical |

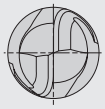


●: Line-up

## TEB**A2-**C**H...

2 flutes ball nose, 30° helix, stub cut length for materials up to 55 - 70 HRC

H
Hard Materials





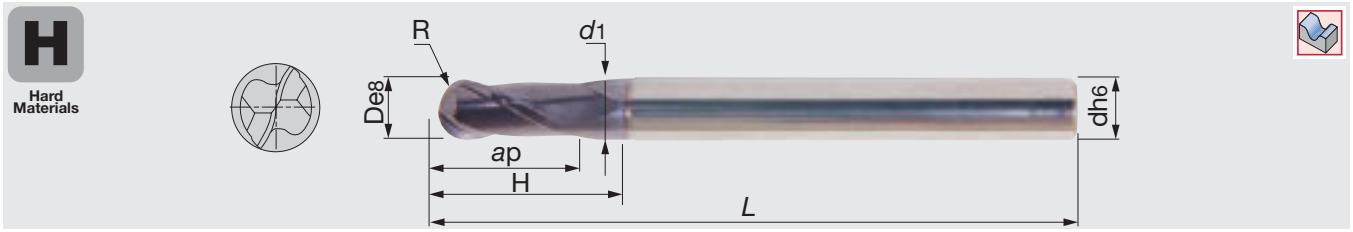

| Designation | AH750 | D | d | $d_1$ | $R^{\pm 0.01}$ | $a_p$ | H | L | Shank |
|---|---|---|---|---|---|---|---|---|---|
| TEB010A2-01/02C04H50 | ● | 1 | 4 | 0.95 | 0.5 | 1 | 2.2 | 50 | Cylindrical |
| TEB020A2-02/04C06H50 | ● | 2 | 6 | 1.9 | 1 | 2 | 4 | 50 | Cylindrical |
| TEB030A2-03/06C06H60 | ● | 3 | 6 | 2.9 | 1.5 | 3 | 6 | 60 | Cylindrical |
| TEB040A2-04/08C06H70 | ● | 4 | 6 | 3.9 | 2 | 4 | 8 | 70 | Cylindrical |
| TEB050A2-05/10C06H80 | ● | 5 | 6 | 4.9 | 2.5 | 5 | 10 | 80 | Cylindrical |
| TEB060A2-06/12C06H90 | ● | 6 | 6 | 5.9 | 3 | 6 | 12 | 90 | Cylindrical |
| TEB080A2-08/16C08H100 | ● | 8 | 8 | 7.9 | 4 | 8 | 16 | 100 | Cylindrical |
| TEB100A2-10/20C10H100 | ● | 10 | 10 | 9.9 | 5 | 10 | 20 | 100 | Cylindrical |
| TEB120A2-12/24C12H110 | ● | 12 | 12 | 11.9 | 6 | 12 | 24 | 110 | Cylindrical |
| TEB160A2-16/32C16H140 | ● | 16 | 16 | 15.8 | 8 | 16 | 32 | 140 | Cylindrical |
| TEB200A2-20/40C20H160 | ● | 20 | 20 | 19.8 | 10 | 20 | 40 | 160 | Cylindrical |



●: Line-up

## TEB**A2-**C**M...

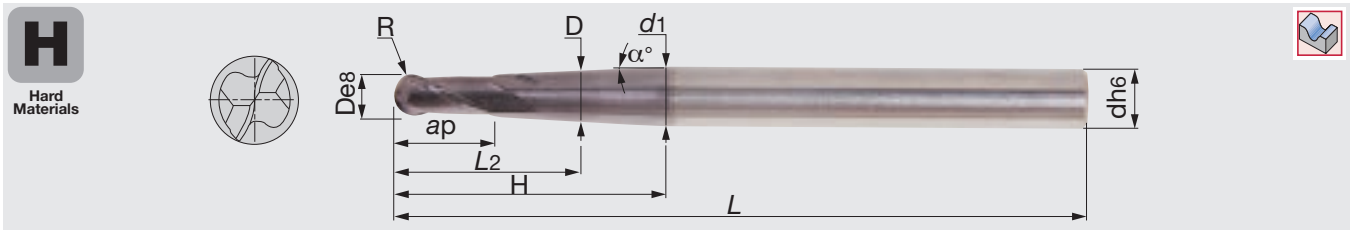
2 flutes long ball nose with neck, 30° helix for materials up to 65 HRC




| Designation | AH750 | D | d | d1 | R | ap | H | L | Shank |
|---|---|---|---|---|---|---|---|---|---|
| TEB030A2-08C06M70 | ● | 3 | 6 | - | 1.5 | 8 | - | 70 | Cylindrical |
| TEB040A2-08C06M70 | ● | 4 | 6 | - | 2 | 8 | - | 70 | Cylindrical |
| TEB050A2-12C06M80 | ● | 5 | 6 | - | 2.5 | 12 | - | 80 | Cylindrical |
| TEB060A2-12/22C06M80 | ● | 6 | 6 | 5.8 | 3 | 12 | 22 | 80 | Cylindrical |
| TEB080A2-14/27C08M90 | ● | 8 | 8 | 7.8 | 4 | 14 | 27 | 90 | Cylindrical |
| TEB100A2-18/31C10M100 | ● | 10 | 10 | 9.8 | 5 | 18 | 31 | 100 | Cylindrical |
| TEB120A2-22/35C12M110 | ● | 12 | 12 | 11.8 | 6 | 22 | 35 | 110 | Cylindrical |
| TEB160A2-30/50C16M140 | ● | 16 | 16 | 15.8 | 8 | 30 | 50 | 140 | Cylindrical |
| TEB200A2-38/58C20M160 | ● | 20 | 20 | 19.8 | 10 | 38 | 58 | 160 | Cylindrical |

## TEB**A2-**C**M...

2 flutes ball nose, tapered neck for materials up to 65 HRC



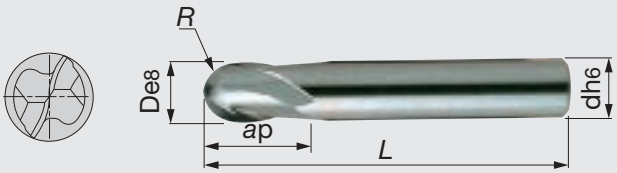

| Designation | AH750 | D | d | d1 | R±0.01 | ap | L2 | H | α° | L | Shank |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TEB010A2-02/04/3.0C06M80 | ● | 1 | 6 | 5 | 0.5 | 2 | 4 | 42 | 3 | 80 | Cylindrical |
| TEB020A2-04/06/3.0C06M80 | ● | 2 | 6 | 5.7 | 1 | 4 | 6 | 41 | 3 | 80 | Cylindrical |
| TEB030A2-06/08/3.0C06M70 | ● | 3 | 6 | 5.6 | 1.5 | 6 | 8 | 32 | 3 | 70 | Cylindrical |
| TEB040A2-08/10/1.5C06M90 | ● | 4 | 6 | 6 | 2 | 8 | 10 | 49 | 1.5 | 90 | Cylindrical |
| TEB050A2-10/12/1.5C08M110 | ● | 5 | 8 | 7.6 | 2.5 | 10 | 12 | 61 | 1.5 | 110 | Cylindrical |
| TEB060A2-12/15/1.5C08M110 | ● | 6 | 8 | 8 | 3 | 12 | 15 | 53 | 1.5 | 110 | Cylindrical |
| TEB080A2-14/17/1.5C10M120 | ● | 8 | 10 | 10 | 4 | 14 | 17 | 55 | 1.5 | 120 | Cylindrical |
| TEB100A2-18/21/1.5C12M130 | ● | 10 | 12 | 12 | 5 | 18 | 21 | 59 | 1.5 | 130 | Cylindrical |
| TEB120A2-22/25/1.5C16M160 | ● | 12 | 16 | 15 | 6 | 22 | 25 | 83 | 1.5 | 160 | Cylindrical |



●: Line-up

## TEB**A2-**C**-E...

2 flutes ball nose, 30° helix, short length




| Designation | AH725 | D | *d* | R | *ap* | *L* | Shank |
|---|---|---|---|---|---|---|---|
| TEB020A2-06C03-E38 | ● | 2 | 3 | 1 | 6 | 38 | Cylindrical |
| TEB020A2-04C06-E48 | ● | 2 | 6 | 1 | 4 | 48 | Cylindrical |
| TEB025A2-04C06-E48 | ● | 2.5 | 6 | 1.3 | 4 | 48 | Cylindrical |
| TEB030A2-04C06-E48 | ● | 3 | 6 | 1.5 | 4 | 48 | Cylindrical |
| TEB040A2-06C06-E50 | ● | 4 | 6 | 2 | 6 | 50 | Cylindrical |
| TEB050A2-07C06-E51 | ● | 5 | 6 | 2.5 | 7 | 51 | Cylindrical |
| TEB060A2-07C06-E51 | ● | 6 | 6 | 3 | 7 | 51 | Cylindrical |
| TEB080A2-09C08-E59 | ● | 8 | 8 | 4 | 9 | 59 | Cylindrical |
| TEB100A2-10C10-E60 | ● | 10 | 10 | 5 | 10 | 60 | Cylindrical |
| TEB120A2-14C12-E71 | ● | 12 | 12 | 6 | 14 | 71 | Cylindrical |
| TEB140A2-14C14-E71 | ● | 14 | 14 | 7 | 14 | 71 | Cylindrical |
| TEB160A2-16C16-E76 | ● | 16 | 16 | 8 | 16 | 76 | Cylindrical |
| TEB180A2-18C18-E76 | ● | 18 | 18 | 9 | 18 | 76 | Cylindrical |
| TEB200A2-20C20-E82 | ● | 20 | 20 | 10 | 20 | 82 | Cylindrical |

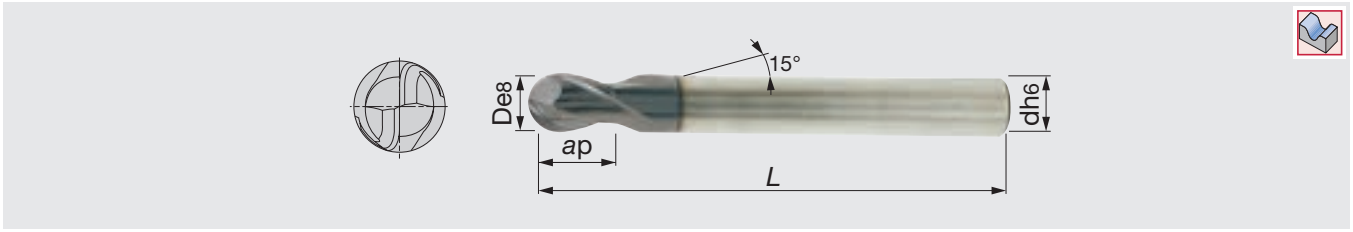


●: Line-up

SOLIDMEISTER TUNGALOY

## TEB**A2-**C**-...

2 flutes ball nose, 30° helix, short length



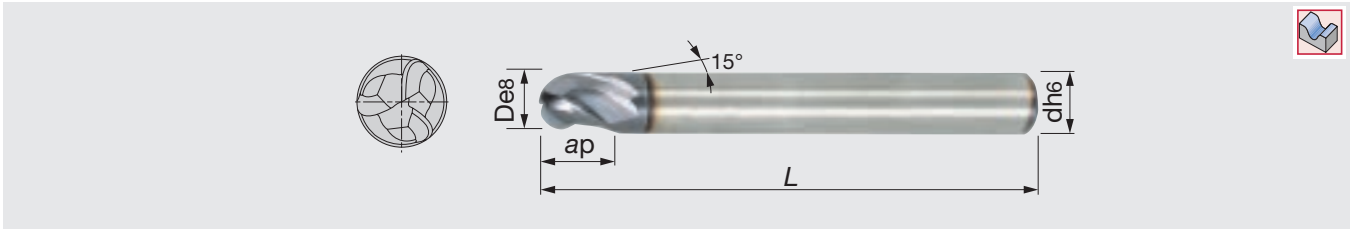

| Designation | AH725 | D | *d* | $a_p$ | *L* | Shank |
|---|---|---|---|---|---|---|
| TEB030A2-05C06-57 | ● | 3 | 6 | 5 | 57 | Cylindrical |
| TEB040A2-07C06-57 | ● | 4 | 6 | 7 | 57 | Cylindrical |
| TEB050A2-08C06-57 | ● | 5 | 6 | 8 | 57 | Cylindrical |
| TEB060A2-08C06-57 | ● | 6 | 6 | 8 | 57 | Cylindrical |
| TEB080A2-11C08-63 | ● | 8 | 8 | 11 | 63 | Cylindrical |
| TEB100A2-13C10-72 | ● | 10 | 10 | 13 | 72 | Cylindrical |
| TEB120A2-14C12-83 | ● | 12 | 12 | 14 | 83 | Cylindrical |
| TEB160A2-16C16-92 | ● | 16 | 16 | 16 | 92 | Cylindrical |
| TEB200A2-20C20-104 | ● | 20 | 20 | 20 | 104 | Cylindrical |

Short and stable design for profiling (roughing).

SOLIDMEISTER TUNGALOY

## TEB**A3...

3 flutes ball nose, 30° helix, short length




| Designation | AH725 | D | *d* | $a_p$ | *L* | Shank |
|---|---|---|---|---|---|---|
| TEB030A3-05C06-57 | ● | 3 | 6 | 5 | 57 | Cylindrical |
| TEB040A3-07C06-57 | ● | 4 | 6 | 7 | 57 | Cylindrical |
| TEB050A3-08C06-57 | ● | 5 | 6 | 8 | 57 | Cylindrical |
| TEB060A3-08C06-57 | ● | 6 | 6 | 9 | 57 | Cylindrical |
| TEB080A3-11C08-63 | ● | 8 | 8 | 11 | 63 | Cylindrical |
| TEB100A3-13C10-72 | ● | 10 | 10 | 13 | 72 | Cylindrical |
| TEB120A3-14C12-83 | ● | 12 | 12 | 14 | 83 | Cylindrical |
| TEB160A3-16C16-92 | ● | 16 | 16 | 16 | 92 | Cylindrical |
| TEB200A3-20C20-104 | ● | 20 | 20 | 20 | 104 | Cylindrical |

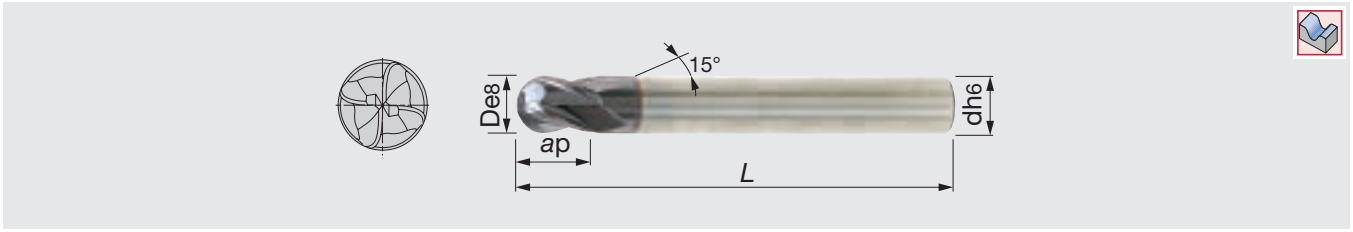
Short and stable design for contouring (roughing).



●: Line-up

## TEB**A4...

4 flutes ball nose, 30° helix, short length




| Designation | AH725 | D | *d* | $a_p$ | *L* | Shank |
|---|---|---|---|---|---|---|
| TEB030A4-05C06-57 | ● | 3 | 6 | 5 | 57 | Cylindrical |
| TEB040A4-07C06-50 | ● | 4 | 6 | 7 | 50 | Cylindrical |
| TEB050A4-08C06-57 | ● | 5 | 6 | 8 | 57 | Cylindrical |
| TEB060A4-08C06-57 | ● | 6 | 6 | 9 | 57 | Cylindrical |
| TEB080A4-11C08-63 | ● | 8 | 8 | 11 | 63 | Cylindrical |
| TEB100A4-13C10-72 | ● | 10 | 10 | 13 | 72 | Cylindrical |
| TEB120A4-14C12-83 | ● | 12 | 12 | 14 | 83 | Cylindrical |
| TEB160A4-16C16-92 | ● | 16 | 16 | 16 | 92 | Cylindrical |
| TEB200A4-20C20-104 | ● | 20 | 20 | 20 | 104 | Cylindrical |

Short and stable design for profiling (finishing).



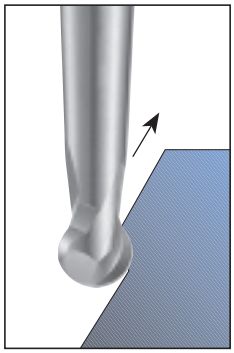
●: Line-up

## Ball Nose Characteristics

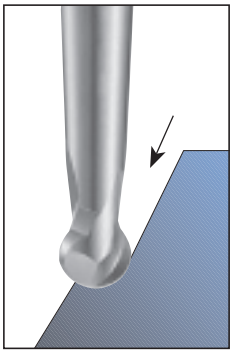
- Die & mold making, turbine manufacturing and aircraft industry, etc.
- Useful for intricate-shaped surfaces.
- Profiling of up to 70 HRC high hardened steels and alloy steels, nickel based alloys, titanium alloys.
- Ultra-fine grain carbide which increases both toughness and hardness.
- Suitable for dry and high speed cutting.
- Special sphere shaped tool geometry provides increased tool life and enables higher speed and feed operations.

## Milling Features

- Operating angle 208° - 212°
- Excellent surface roughness and high milling process.
- Enables milling with high speed and feed in back milling mode.



**Favorable Back Milling** ✓

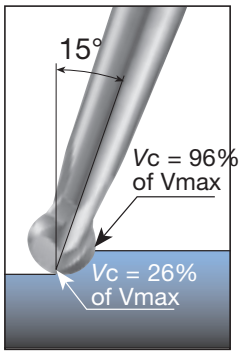


**Unfavorable Drilling**

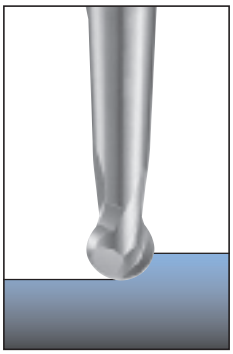


## Operating Recommendations

- It is recommended to machine with the tool inclined at a 15° angle. This technique eliminates cutting at nearly zero speed at the tool axis. Cutting is more efficient, and tool life substantially improves.
- Decreased cutting force.
- Excellent surface roughness and brightness.




**Favorable Profiling** ✓



**Unfavorable Profiling**

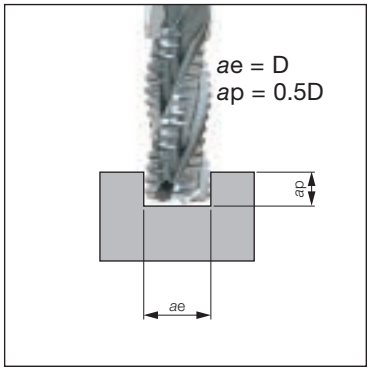
MEMO

# MACHINING DATA FOR SHREDMEISTER ROUGHER ENDMILLS

| ISO | Material | | Condition | Tensile Strength (N/mm2) | Hardness HB | Cutting speed: *Vc* (m/min) min | max |
|---|---|---|---|---|---|---|---|
| P | Non-alloy steel and cast steel, free cutting steel | < 0.25 %C | Annealed | 420 | 125 | 260 | 280 |
| | | ≥ 0.25 %C | Annealed | 650 | 190 | 200 | 230 |
| | | < 0.55 %C | Quenched and tempered | 850 | 250 | 160 | 190 |
| | | ≥ 0.55 %C | Annealed | 750 | 220 | 160 | 180 |
| | | ≥ 0.55 %C | Quenched and tempered | 1000 | 300 | 140 | 160 |
| | Low alloy steel and cast steel (less than 5% all elements) | | Annealed | 600 | 200 | 160 | 190 |
| | | | Quenched and tempered | 930 | 275 | 120 | 140 |
| | | | Quenched and tempered | 1000 | 300 | 130 | 150 |
| | | | Quenched and tempered | 1200 | 350 | 140 | 160 |
| | High alloy steel, cast steel, and tool steel | | Annealed | 680 | 200 | 130 | 160 |
| | | | Quenched and tempered | 1100 | 325 | 70 | 90 |
| M | Stainless steel and cast steel | | Ferritic / martensitic | 680 | 200 | 110 | 200 |
| | | | Martensitic | 820 | 240 | 60 | 180 |
| | | | Austenitic | 600 | 180 | 80 | 120 |
| K | Cast iron nodular (GGG) | | Ferritic / pearlitic | - | 180 | 80 | 260 |
| | | | Pearlitic | - | 260 | 130 | 240 |
| | Grey cast iron (GG) | | Ferritic | - | 160 | 150 | 280 |
| | | | Pearlitic | - | 250 | 90 | 280 |
| | Malleable cast iron | | Ferritic | - | 130 | 150 | 280 |
| | | | Pearlitic | - | 230 | 140 | 240 |
| N | Aluminium-wrought alloy | | Not cureable | - | 60 | 810 | 840 |
| | | | Cured | - | 100 | 730 | 830 |
| | Aluminium-cast, alloyed | ≤ 12% Si | Not cureable | - | 75 | 800 | 840 |
| | | | Cured | - | 90 | 730 | 830 |
| | | > 12% Si | High temperature | - | 130 | 320 | 340 |
| | Copper alloys | > 1% Pb | Free cutting | - | 110 | 400 | 430 |
| | | | Brass | - | 90 | 400 | 430 |
| | | | Electrolitic copper | - | 100 | 270 | 300 |
| | Non-metallic | | Duroplastics, fiber plastics | - | - | - | - |
| | | | Hard rubber | - | - | - | - |
| S | High temp. alloys | Fe based | Annealed | - | 200 | 20 | 40 |
| | | Fe based | Cured | - | 280 | 20 | 30 |
| | | Ni or Co based | Annealed | - | 250 | 20 | 30 |
| | | Ni or Co based | Cured | - | 350 | 20 | 30 |
| | | Ni or Co based | Cast | - | 320 | 30 | 70 |
| | Titanium and Ti alloys | | | RM 400 | - | 30 | 70 |
| | | | Alpha + beta alloys cured | RM 1050 | - | 30 | 70 |
| H | Hardened steel | | Hardened | - | 55 HRC | 30 | 50 |
| | | | Hardened | - | 60 HRC | 30 | 40 |
| | Chilled cast iron | | Cast | - | 400 | 60 | 80 |
| | Cast iron | | Hardened | - | 55 HRC | 30 | 50 |

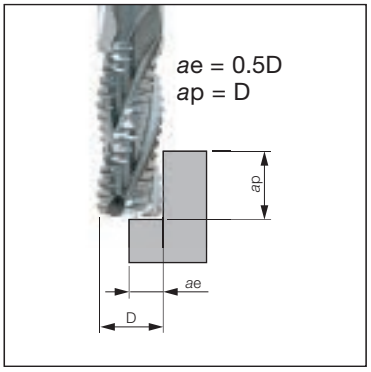
## Recommended Feeds

### Slotting




| D (mm) | Min. *fz* | Max. *fz* |
|---|---|---|
| 1 | 0.006 | 0.01 |
| 1.3 | 0.006 | 0.02 |
| 1.5 | 0.006 | 0.04 |
| 1.8 | 0.01 | 0.05 |
| 2 | 0.01 | 0.06 |
| 2.3 | 0.01 | 0.06 |
| 2.5 | 0.01 | 0.06 |
| 2.8 | 0.02 | 0.07 |
| 3 | 0.02 | 0.08 |
| 3.3 | 0.02 | 0.08 |
| 4 | 0.03 | 0.09 |
| 4.3 | 0.03 | 0.09 |
| 5 | 0.04 | 0.1 |
| 6 | 0.05 | 0.12 |
| 7 | 0.06 | 0.14 |
| 8 | 0.06 | 0.16 |
| 9 | 0.06 | 0.16 |
| 10 | 0.06 | 0.18 |
| 12 | 0.07 | 0.2 |
| 14 | 0.08 | 0.22 |
| 16 | 0.1 | 0.24 |
| 18 | 0.1 | 0.26 |
| 20 | 0.1 | 0.3 |
| 25 | 0.12 | 0.3 |

### Shoulder milling



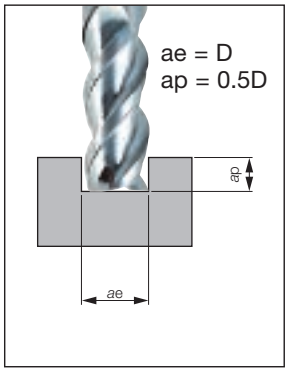

| D (mm) | Min. *fz* | Max. *fz* |
|---|---|---|
| 1 | 0.006 | 0.014 |
| 1.3 | 0.006 | 0.024 |
| 1.5 | 0.006 | 0.044 |
| 1.8 | 0.01 | 0.056 |
| 2 | 0.01 | 0.066 |
| 2.3 | 0.01 | 0.066 |
| 2.5 | 0.01 | 0.066 |
| 2.8 | 0.02 | 0.076 |
| 3 | 0.02 | 0.088 |
| 3.3 | 0.02 | 0.088 |
| 4 | 0.03 | 0.098 |
| 4.3 | 0.03 | 0.098 |
| 5 | 0.04 | 0.11 |
| 6 | 0.05 | 0.132 |
| 7 | 0.06 | 0.154 |
| 8 | 0.06 | 0.176 |
| 9 | 0.06 | 0.176 |
| 10 | 0.06 | 0.196 |
| 12 | 0.07 | 0.216 |
| 14 | 0.08 | 0.238 |
| 16 | 0.1 | 0.26 |
| 18 | 0.1 | 0.28 |
| 20 | 0.1 | 0.34 |
| 25 | 0.12 | 0.36 |

# MACHINING DATA FOR SOLID CARBIDE ENDMILLS

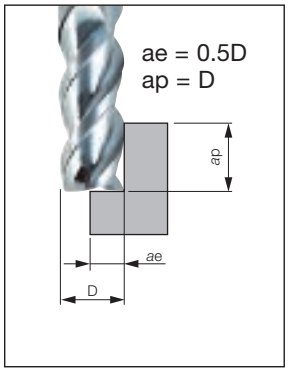
| ISO | Material | | Condition | Tensile Strength (N/mm2) | Hardness HB | Cutting speed: *Vc* (m/min) min | max |
|---|---|---|---|---|---|---|---|
| P | Non-alloy steel and cast steel, free cutting steel | < 0.25 %C | Annealed | 420 | 125 | 220 | 230 |
| | | ≥ 0.25 %C | Annealed | 650 | 190 | 170 | 190 |
| | | < 0.55 %C | Quenched and tempered | 850 | 250 | 140 | 150 |
| | | ≥ 0.55 %C | Annealed | 750 | 220 | 140 | 150 |
| | | ≥ 0.55 %C | Quenched and tempered | 1000 | 300 | 120 | 130 |
| | Low alloy steel and cast steel (less than 5% all elements) | | Annealed | 600 | 200 | 140 | 150 |
| | | | Quenched and tempered | 930 | 275 | 100 | 110 |
| | | | Quenched and tempered | 1000 | 300 | 110 | 120 |
| | | | Quenched and tempered | 1200 | 350 | 120 | 130 |
| | High alloy steel, cast steel, and tool steel | | Annealed | 680 | 200 | 110 | 130 |
| | | | Quenched and tempered | 1100 | 325 | 60 | 70 |
| M | Stainless steel and cast steel | | Ferritic / martensitic | 680 | 200 | 100 | 170 |
| | | | Martensitic | 820 | 240 | 60 | 150 |
| | | | Austenitic | 600 | 180 | 70 | 100 |
| K | Cast iron nodular (GGG) | | Ferritic / pearlitic | - | 180 | 70 | 220 |
| | | | Pearlitic | - | 260 | 110 | 200 |
| | Grey cast iron (GG) | | Ferritic | - | 160 | 130 | 230 |
| | | | Pearlitic | - | 250 | 70 | 230 |
| | Malleable cast iron | | Ferritic | - | 130 | 130 | 230 |
| | | | Pearlitic | - | 230 | 110 | 200 |
| N | Aluminium-wrought alloy | | Not cureable | - | 60 | 670 | 700 |
| | | | Cured | - | 100 | 610 | 690 |
| | Aluminium-cast, alloyed | ≤ 12% Si | Not cureable | - | 75 | 670 | 700 |
| | | | Cured | - | 90 | 610 | 690 |
| | | > 12% Si | High temperature | - | 130 | 270 | 280 |
| | Copper alloys | > 1% Pb | Free cutting | - | 110 | 330 | 350 |
| | | | Brass | - | 90 | 330 | 350 |
| | | | Electrolitic copper | - | 100 | 230 | 250 |
| | Non-metallic | | Duroplastics, fiber plastics | - | - | - | - |
| | | | Hard rubber | - | - | - | - |
| S | High temp. alloys | Fe based | Annealed | - | 200 | 20 | 30 |
| | | Fe based | Cured | - | 280 | 20 | 20 |
| | | Ni or Co based | Annealed | - | 250 | 20 | 20 |
| | | Ni or Co based | Cured | - | 350 | 20 | 20 |
| | | Ni or Co based | Cast | - | 320 | 30 | 60 |
| | Titanium and Ti alloys | | | RM 400 | - | 30 | 60 |
| | | | Alpha + beta alloys cured | RM 1050 | - | 30 | 60 |
| H | Hardened steel | | Hardened | - | 55 HRC | 30 | 40 |
| | | | Hardened | - | 60 HRC | 30 | 30 |
| | Chilled cast iron | | Cast | - | 400 | 50 | 60 |
| | Cast iron | | Hardened | - | 55 HRC | 30 | 40 |

## Recommended Feeds

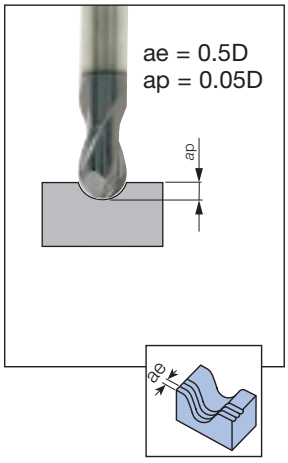
**Slotting**




**Shoulder milling**




**Profiling**




| Slotting | | | Shoulder milling / Profiling | |
|---|---|---|---|---|
| D (mm) | Min. *fz* | Max. *fz* | Min. *fz* | Max. *fz* |
| 1 | 0.003 | 0.005 | 0.003 | 0.007 |
| 1.3 | 0.003 | 0.01 | 0.003 | 0.012 |
| 1.5 | 0.003 | 0.02 | 0.003 | 0.022 |
| 1.8 | 0.005 | 0.025 | 0.005 | 0.028 |
| 2 | 0.005 | 0.03 | 0.005 | 0.033 |
| 2.3 | 0.005 | 0.03 | 0.005 | 0.033 |
| 2.5 | 0.005 | 0.03 | 0.005 | 0.03 |
| 2.8 | 0.01 | 0.035 | 0.01 | 0.038 |
| 3 | 0.01 | 0.04 | 0.01 | 0.044 |
| 3.3 | 0.015 | 0.04 | 0.01 | 0.044 |
| 4 | 0.015 | 0.045 | 0.015 | 0.049 |
| 4.3 | 0.020 | 0.045 | 0.015 | 0.049 |
| 5 | 0.025 | 0.05 | 0.02 | 0.055 |
| 6 | 0.03 | 0.06 | 0.025 | 0.066 |
| 7 | 0.03 | 0.07 | 0.03 | 0.077 |
| 8 | 0.03 | 0.08 | 0.03 | 0.088 |
| 9 | 0.03 | 0.08 | 0.03 | 0.088 |
| 10 | 0.035 | 0.09 | 0.03 | 0.098 |
| 12 | 0.04 | 0.1 | 0.035 | 0.108 |
| 14 | 0.05 | 0.11 | 0.04 | 0.119 |
| 16 | 0.05 | 0.12 | 0.05 | 0.13 |
| 18 | 0.05 | 0.13 | 0.05 | 0.14 |
| 20 | 0.05 | 0.15 | 0.05 | 0.17 |
| 25 | 0.06 | 0.15 | 0.06 | 0.18 |

1. For Slotting — M type materials — *ap* max = 0.5D
   S type materials — *ap* max = 0.25D
2. For Finishing — P type materials — *ap* max = 1.5D
3. For Roughing — *ap* max = 1.5D
   V = 1.25 x *Vc*

**High speed cutting on Hard materials (up to 60 HRC):**
Apply small depth of cut: *ap* (0.1 - 0.3 mm) at *Vc* 80 - 160 m/min

## GRADE PRIORITIES FOR SOLID CARBIDE ENDMILLS

In most cases the best performance can be attained without using coolant for specific grades. However, it should be noted that if for any reason coolant must be used, it could possibly affect tool life and sometimes cause insert failure, due to thermal shock.

| Material Groups | ISO P Steel | ISO H Hard Materials | ISO M Stainless | ISO S Superalloys | ISO K Cast Iron | ISO N Non-ferrous |
|---|---|---|---|---|---|---|
|  | Harder<br>AH750<br>**AH725**<br>Tougher | Harder<br>**AH750**<br>AH725<br>Tougher | Harder<br>**AH725**<br>Tougher | Harder<br>AH750<br>**AH725**<br>KS15F<br>Tougher | Harder<br>AH750<br>**AH725**<br>Tougher | Harder<br>AH725<br>**KS15F**<br>Tougher |

■ First choice

MEMO

# Milling Insert

## ● ACMT**PR-MJ

| Shape | Designation | Coating | | | | Applicable mills |
|---|---|---|---|---|---|---|
| | | AH120 | AH140 | GH330 | T3130 | |
|  | ACMT060308PR-MJ | ● | ● | ● | ● | ELP07/09/12... Page D094 |
| | ACMT07T308PR-MJ | ● | ● | ● | ● | |
| | ACMT100408PR-MJ | ● | ● | ● | ● | |

## ● ADMT**PR-MJ

| Shape | Designation | Coating | | | Applicable mills |
|---|---|---|---|---|---|
| | | AH120 | AH140 | T3130 | |
|  | ADMT130308PR-MJ | ● | ● | ● | ELP13/17/21... Page D094 |
| | ADMT17T308PR-MJ | ● | ● | ● | |
| | ADMT210408PR-MJ | ● | ● | ● | |

## ● AECW**PEFR, AECW**PESR, AEMW**PEFR, AEMW**PETR

| Shape | Designation | Coating | | Cermet | Uncoated | | Applicable mills |
|---|---|---|---|---|---|---|---|
| | | AH120 | GH330 | NS740 | UX30 | TH10 | |
|  | AECW1403PEFR | | | | | ● | EPE4000/5000/6000... Page D097 |
| | AECW1403PESR | ● | ● | ● | ● | | |
| | AECW16T3PEFR | | | | | ● | |
| | AECW16T3PESR | ● | ● | ● | ● | | |
| | AECW1804PEFR | | | | | ● | |
| | AECW1804PESR | ● | ● | ● | ● | | |
| | AEMW1403PEFR | | | | | ● | |
| | AEMW1403PETR | | ● | ● | ● | | |
| | AEMW16T3PEFR | | | | | ● | |
| | AEMW16T3PETR | | ● | ● | ● | | |
| | AEMW1804PEFR | | | | | ● | |
| | AEMW1804PETR | | ● | ● | ● | | |

## ● ANEA542TN, ANEA642TN

| Shape | Designation | Uncoated | Applicable mills |
|---|---|---|---|
| | | UX30 | |
|  | ANEA542TN | ● | VSN... (Former products) |
| | ANEA642TN | ● | |

●: Line-up

# Milling Insert

## ● ANMT**PPPR-MJ, ANMT**PPPR-ML

| Shape | Designation | Coating | | | Applicable mills |
|---|---|---|---|---|---|
| | | AH120 | GH330 | T3130 | |
|  -MJ | ANMT09T3PPPR-MJ | ● | ● | ● | EPN09 (Former products) |
| | ANMT09T3PPPR-ML | ● | | | |
| | ANMT1404PPPR-MJ | ● | ● | ● | EPN14... TPN14... (Former products) |
|  -ML | ANMT1404PPPR-ML | ● | | | |

## ● AOMT**PDPR-MJ, AOGT**PDFR-AJ, AOMT070208PDPR-HJ

| Shape | Designation | Coating | | Uncoated | Applicable mills |
|---|---|---|---|---|---|
| | | AH140 | AH725 | KS15F | |
|  AOMT-MJ | AOMT070202PDPR-MJ | ● | ● | | TUNGREC TPO07... Page D054 EPO07... Page D054 HPO07... Page D055 |
| | AOMT070204PDPR-MJ | ● | ● | | |
| | AOMT070208PDPR-MJ | ● | ● | | |
| | AOMT070216PDPR-MJ | ● | ● | | |
|  AOMT-HJ | AOMT070208PDPR-HJ | ● | ● | | |
| | AOGT070204PDFR-AJ | | | ● | |
|  AOGT-AJ | | | | | |

## ● AOMT**PDPR-MJ, AOGT**PDFR-AJ

| Shape | Designation | Coating | | Uncoated | Applicable mills |
|---|---|---|---|---|---|
| | | AH140 | AH725 | KS15F | |
|  -MJ | AOMT180508PDPR-MJ | ● | ● | | TUNGREC TPO18... Page D065 EPO18... Page D066 |
| | AOMT180516PDPR-MJ | ● | ● | | |
| | AOMT180524PDPR-MJ | ● | ● | | |
| | AOMT180532PDPR-MJ | ● | ● | | |
|  -AJ | AOGT180504PDFR-AJ | | | ● | |
| | AOGT180508PDFR-AJ | | | ● | |

Insert

● : Line-up

# Milling Insert

## ● APMT**PN-MJ

| Shape | Designation | Coating | | | | Applicable mills |
|---|---|---|---|---|---|---|
| | | AH120 | AH140 | GH330 | T3130 | |
|  | APMT070308PN-MJ | ● | ● | ● | ● | ELP07/09/12... Page D094 |
| | APMT09T308PN-MJ | ● | ● | ● | ● | |
| | APMT120408PN-MJ | ● | ● | ● | ● | |

## ● APMT120416PR-MJ

| Shape | Designation | Coating | | Applicable mills |
|---|---|---|---|---|
| | | AH120 | T3130 | |
|  | APMT120416PR-MJ | ● | ● | TZP12... Page D220 HZP12... Page D269 |

## ● ASMT**PDPR-MJ, ASGT11**PDFR-AJ, ASMT304PDPR-MS

| Shape | Designation | Coating | | | | | | | Cermet | Uncoated | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH130 | AH140 | AH725 | T1115 | T1215 | T3130 | DS1100 | NS740 | KS05F | |
|  ASMT-MJ | ASMT11T304PDPR-MJ | ● | | | ● | ● | | ● | | ● | | TUNGREC TPO11... Page D058 |
| | ASMT11T308PDPR-MJ | ● | | | ● | ● | ● | ● | | ● | | |
| | ASMT11T312PDPR-MJ | ● | | | ● | | | ● | | | | |
| | ASMT11T316PDPR-MJ | ● | | | ● | | | ● | | ● | | TLS11... Page D058 |
|  ASMT-MS | ASMT11T320PDPR-MJ | ● | | | | | | | | | | |
| | ASMT11T330PDPR-MJ | ● | | | | | | | | | | EPO11... Page D059 |
| | ASMT11T304PDPR-MS | | ● | ● | | | | | | | | |
|  ASGT-AJ | ASGT11T304PDFR-AJ | | | | | | | | ● | | ● | HPO11... Page D060 |
| | ASGT11T308PDFR-AJ | | | | | | | | ● | | ● | |
| | | | | | | | | | | | | ELS11... Page D060 |

Insert

● : Line-up

# Milling Insert

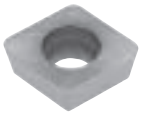
## ● ASMT17**PDPR-MJ, ASGT17**PDFR-AJ, ASMT170508PDPR-MS

| Shape | Designation | Coating | | | | | | Cermet | | | Uncoated | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH130 | AH140 | T1115 | T3130 | DS1100 | NS740 | | | KS05F | | |
|  -MJ | ASMT170504PDPR-MJ | ● | | | ● | ● | | ● | | | | | TPS17... Page D100 |
| | ASMT170508PDPR-MJ | ● | | | ● | ● | | ● | | | | | EPS17... Page D100 |
| | ASMT170512PDPR-MJ | ● | | | | ● | | | | | | | |
| | ASMT170516PDPR-MJ | ● | | | | ● | | ● | | | | | |
|  -MS | ASMT170520PDPR-MJ | ● | | | | | | | | | | | |
| | ASMT170530PDPR-MJ | ● | | | | | | | | | | | |
| | ASMT170532PDPR-MJ | ● | | | | ● | | ● | | | | | |
| | ASMT170508PDPR-MS | | ● | ● | | | | | | | | | |
|  -AJ | ASGT170504PDFR-AJ | | | | | | ● | | | | ● | | |
| | ASGT170508PDFR-AJ | | | | | | ● | | | | ● | | |
| | | | | | | | | | | | | | |

## ● AVGT**PBER-MJ, AVGT**PBFR-AJ

| Shape | Designation | Coating | | | Uncoated | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH3135 | | KS05F | | | | | | |
|  -MJ | AVGT060302PBER-MJ | ● | ● | | | | | | | | TUNGFREC EPAV... Page D050 HPAV06... Page D050 |
| | AVGT060304PBER-MJ | ● | ● | | | | | | | | |
| | AVGT060308PBER-MJ | ● | ● | | | | | | | | |
| | AVGT060302PBFR-AJ | | | | ● | | | | | | |
| | AVGT060304PBFR-AJ | | | | ● | | | | | | |
|  -AJ | AVGT060308PBFR-AJ | | | | ● | | | | | | |
| | | | | | | | | | | | |

## ● CPMW**-EN, CPMT**-EN

| Shape | Designation | Coating | | | Uncoated | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | GH330 | | | UX30 | | | | | | |
|  | CPMW050208EN | ● | | | ● | | | | | | EVP1000 (Former products) |
| | CPMW06T208EN | ● | | | ● | | | | | | |
| | CPMT080308EN | ● | | | ● | | | | | | |
| | | | | | | | | | | | |

Insert

● : Line-up

# Milling Insert

## ● DCMW**TN

| Shape | Designation | Coating | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH330 | | | | | | | | |
|  | DCMW070204TN | ● | ● | | | | | | | | EBP... Page D214 |
| | DCMW11T304TN | ● | ● | | | | | | | | HBP... Page D271 |
| | | | | | | | | | | | |

## ● DPCW11T3ZFR

| Shape | Designation | Coating | | Cermet | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH740 | NS740 | | | | | | | |
|  | DPCW11T3ZFR | ● | ● | ● | | | | | | | TZF11... Page D222 |
| | | | | | | | | | | | HZF11... Page D270 |

## ● EDKW53ZTR

| Shape | Designation | Coating | | Uncoated | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | GH330 | | UX30 | | | | | | | |
|  | EDKW53ZTR | ● | | ● | | | | | | | ESD5000 (Former products) |
| | | | | | | | | | | | |

## ● ENEQ**TN-T

| Shape | Designation | Coating | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | | | | | | | | | |
|  | ENEQ090508TN-T | ● | | | | | | | | | VSNE09... (Former products) |
| | ENEQ100508TN-T | ● | | | | | | | | | VSNE10... (Former products) |
| | ENEQ130608TN-T | ● | | | | | | | | | VSNE13... (Former products) |
| | ENEQ160608TN-T | ● | | | | | | | | | VSNE16... (Former products) |

Insert

● : Line-up

# Milling Insert

## ● GDMT**PDPR-MJ, GDGT**PDFR-AJ

| Shape | Designation | Coating | | | | | Uncoated | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH140 | AH330 | T3130 | DS1100 | UX30 | TH10 | | | | |
|  -MJ | **GDMT10H3PDPR-MJ** | ● | ● | ● | ● | | ● | | | | | ESD10/17... Page D105 |
| | **GDMT17X6PDPR-MJ** | ● | ● | ● | ● | | ● | | | | | |
| | **GDGT10H3PDFR-AJ** | | | | | ● | | ● | | | | HSD10/17... Page D270 |
|  -AJ | **GDGT17X6PDFR-AJ** | | | | | ● | | ● | | | | |

## ● HEHN532FN

| Shape | Designation | Uncoated | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | TH10 | | | | | | | | | | |
|  | **HEHN532FN** | ● | | | | | | | | | | QYE5300 (Former products) |

## ● HPKN532FN

| Shape | Designation | Uncoated | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | TH10 | | | | | | | | | | |
|  | **HPKN532FN** | ● | | | | | | | | | | QYP5300 (Former products) |



● : Line-up

# Milling Insert

## ● LMEU**ZNEN-MJ

| Shape | Designation | Coating | | | Applicable mills |
|---|---|---|---|---|---|
| | | AH120 | AH140 | AH725 | |
|  | LMEU100808ZNEN-MJ | ● | ● | ● | TECTSLOT<br>ASN 10/12/15...<br>Page D182<br>TSN 10/12/15...<br>Page D183 |
| | LMEU100816ZNEN-MJ | ● | ● | ● | |
| | LMEU100824ZNEN-MJ | ● | ● | ● | |
| | LMEU100832ZNEN-MJ | ● | ● | ● | |
| | LMEU120808ZNEN-MJ | ● | ● | ● | |
| | LMEU120816ZNEN-MJ | ● | ● | ● | |
| | LMEU120824ZNEN-MJ | ● | ● | ● | |
| | LMEU120832ZNEN-MJ | ● | ● | ● | |
| | LMEU150908ZNEN-MJ | ● | ● | ● | |
| | LMEU150916ZNEN-MJ | ● | ● | ● | |
| | LMEU150924ZNEN-MJ | ● | ● | ● | |
| | LMEU150932ZNEN-MJ | ● | ● | ● | |

## ● LMMU**PNER-MJ

| Shape | Designation | Coating | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|
| | | AH120 | AH140 | AH725 | T1115 | T3130 | |
|  | LMMU110708PNER-MJ | ● | ● | ● | ● | ● | TECMILL<br>TPM11/16...<br>Page D084<br>TLM11...<br>Page D084<br>EPM11...<br>Page D085 |
| | LMMU110716PNER-MJ | ● | ● | ● | ● | ● | |
| | LMMU110724PNER-MJ | ● | ● | ● | ● | ● | |
| | LMMU110732PNER-MJ | ● | ● | ● | ● | ● | |
| | LMMU160908PNER-MJ | ● | ● | ● | ● | ● | |
| | LMMU160916PNER-MJ | ● | ● | ● | ● | ● | |
| | LMMU160924PNER-MJ | ● | ● | ● | ● | | |
| | LMMU160932PNER-MJ | ● | ● | ● | ● | | |

## ● LNCA64ZTR

| Shape | Designation | Coating | Uncoated | Applicable mills |
|---|---|---|---|---|
| | | T3130 | UX30 | |
|  | LNCA64ZTR | ● | ● | VSN6000I<br>(Former products) |

● : Line-up

# Milling Insert

## ● LNCQ0906N-**L, LNCQ0906R-50S

| Shape | Designation | Coating | | | Cermet | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | GH110 | | NS740 | | | | | | | |
|  | LNCQ0906N-100L | ● | ● | | ● | | | | | | | EMS09... Page D169 |
| | LNCQ0906N-50L | ● | ● | | ● | | | | | | | |
| | LNCQ0906R-50S | ● | ● | | ● | | | | | | | |

## ● LNMU0303ZER-MJ, LNMU0303ZER-ML

| Shape | Designation | Coating | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH130 | AH725 | AH3035 | | | | | | | | |
|  -MJ<br>  -ML | LNMU0303ZER-MJ | ● | ● | ● | | | | | | | | DOFEED<br>TXN03... Page D008<br>EXN03... Page D008<br>HXN03... Page D009 |
| | LNMU0303ZER-ML | ● | ● | ● | | | | | | | | |

## ● LNMU06X5ZER-MJ, LNMU06X5ZER-ML, LNGU06X5ZER-W

| Shape | Designation | Coating | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH130 | AH725 | AH3035 | | | | | | | |
|  -MJ<br>  -ML<br>  -W | LNMU06X5ZER-MJ | ● | ● | ● | ● | | | | | | | DOFEED<br>TXN06... Page D012<br>EXN06... Page D013 |
| | LNMU06X5ZER-ML | ● | ● | ● | ● | | | | | | | |
| | LNGU06X5ZER-W | | | ● | | | | | | | | |



● : Line-up

# Milling Insert

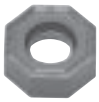
## ● LNMX0405R4-MJ, LNMX0405R4-ML, LNMX0405R4-HJ

| Shape | Designation | Coating | | Applicable mills |
|---|---|---|---|---|
| | | AH120 | AH3135 | |
|  -MJ | LNMX0405R4-MJ | ● | ● | DOTWIST BALL<br>TXLN... Page D016<br>EXLN... Page D016<br>HXLN... Page D017 |
|  -ML | LNMX0405R4-ML | ● | ● | |
|  -HJ | LNMX0405ZER-HJ | ● | ● | |

## ● LQMU**PNER-MJ

| Shape | Designation | Coating | | | Applicable mills |
|---|---|---|---|---|---|
| | | AH120 | AH140 | AH725 | |
|  | LQMU110704PNER-MJ | ● | ● | ● | DOREC<br>TPQ11/18...<br>Page D080<br>EPQ11/18...<br>Page D081 |
| | LQMU110708PNER-MJ | ● | ● | ● | |
| | LQMU110716PNER-MJ | ● | ● | ● | |
| | LQMU110720PNER-MJ | ● | | | |
| | LQMU180804PNER-MJ | ● | ● | ● | |
| | LQMU180808PNER-MJ | ● | ● | ● | |
| | LQMU180816PNER-MJ | ● | ● | ● | |
| | LQMU180824PNER-MJ | ● | ● | ● | |

## ● ONMU0705ANPN-MJ, ONHU0705ANPN-MJ, ONMU0705ANPN-ML, ONHU0705ANTN-ML, ONHU0705ANPR-W

| Shape | Designation | Coating | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH140 | AH725 | AH3135 | T1115 | T1215 | |
|  -ML | ONMU0705ANPN-MJ | | ● | ● | ● | ● | ● | DOOCTO<br>DOQUAD<br>TAN07... Page D123 |
|  -MJ | ONHU0705ANPN-MJ | | ● | ● | | | | |
| | ONMU0705ANPN-ML | ● | | | ● | | | |
| | ONHU0705ANTN-ML | ● | ● | ● | | | | |
|  -W | ONHU0705ANPR-W | ● | | | | | | |

●: Line-up

# Milling Insert

## ● ONGU0507ANEN-MJ, ONGU0507ANEN-W

| Shape | Designation | Coating | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH3135 | T3225 | | | | | | | |
|  -MJ | **ONGU0507ANEN-MJ** | ● | ● | ● | | | | | | | DOTMILL TASN13... Page D120 |
| | **ONGU0507ANEN-W** | ● | ● | | | | | | | | |
|  -W | | | | | | | | | | | |

## ● OWMT0807ZNER-HJ, OWMT0807AAER-ML

| Shape | Designation | Coating | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH130 | AH3135 | | | | | | | | |
|  -HJ | **OWMT0807ZNER-HJ** | | ● | | | | | | | | DOOCTO DOQUAD TAN07... Page D123 |
| | **OWMT0807AAER-ML** | ● | ● | | | | | | | | |
|  -ML | | | | | | | | | | | |



● : Line-up

# Milling Insert

● **PNCU0905GNER-MJ, PNCU0905GNEN-ML, PNCU0905GNFR-AJ, PNMU0905GNEN-MJ, PNCU0905GNER-W**

| Shape | Designation | Coating | | | | | | | Cermet | | Uncoated | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH140 | AH725 | AH3135 | T1115 | T1215 | T3130 | NS740 | | TH10 | | |
|  -MJ | **PNCU0905GNER-MJ** | ● | ● | ● | | ● | | ● | ● | | | | DOPENT TEN09R/L... Page D129 EEN09... Page D130 |
| | **PNCU0905GNEN-ML** | | | | ● | | | | | | | | |
| | **PNCU0905GNFR-AJ** | | | | | | | | | | ● | | |
| | **PNMU0905GNEN-MJ** | ● | | | ● | | ● | | | | | | |
| | **PNCU0905GNER-W** | | | ● | | | | | | | | | |
|  -ML | | | | | | | | | | | | | |
|  -AJ | | | | | | | | | | | | | |
|  PNMU0905-MJ | | | | | | | | | | | | | |
|  -W | | | | | | | | | | | | | |



●: Line-up

# Milling Insert

## ● RCMT**EN-MJ, RCMT**EN-NMJ, RCMT**FN-NAJ

| Shape | Designation | Coating | | | Uncoated | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH140 | AH725 | KS15F | | | | | | |
|  -MJ | RCMT1204EN-MJ | ● | ● | ● | | | | | | | ROUNDSPLIT TRC12/16... Page D201 ERC12/16... Page D202 |
| | RCMT1204EN-NMJ | ● | ● | ● | | | | | | | |
| | RCMT1204FN-NAJ | | | | ● | | | | | | |
| | RCMT1606EN-MJ | ● | ● | ● | | | | | | | |
| | RCMT1606EN-NMJ | ● | ● | ● | | | | | | | |
| | RCMT1606FN-NAJ | | | | ● | | | | | | |
|  -NMJ | | | | | | | | | | | |
|  -NAJ | | | | | | | | | | | |

## ● RDCA2004TN, RDCN2004TN, RDKN2004...

| Shape | Designation | Coating | | | Uncoated | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | | | UX30 | TH10 | | | | | |
|  | RDCA2004TN | | | | ● | | | | | | ERD6000 Page D165 |
| | RDCN2004TN | | | | ● | | | | | | |
| | RDKN2004FN | | | | | ● | | | | | |
| | RDKN2004TN | ● | | | ● | | | | | | |

## ● RDCM1203TN, RDMA1203TN

| Shape | Designation | Uncoated | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | UX30 | | | | | | | | | |
|  | RDCM1203TN | ● | | | | | | | | | ERD4000 (Former products) |
| | RDMA1203TN | ● | | | | | | | | | |

Insert

● : Line-up

# Milling Insert

## ● RDMT**ZDPN-MJ, RDMW**ZDSN

| Shape | Designation | Coating | | | | | Uncoated | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH130 | AH140 | AH330 | T3130 | UX30 | | | | | | |
|  - MJ  | RDMT1204ZDPN-MJ | ● | | ● | ● | ● | ● | | | | | | TRD12/16... Page D206 |
| | RDMW1204ZDSN | ● | | ● | | ● | | | | | | | |
| | RDMT1606ZDPN-MJ | ● | ● | ● | ● | ● | ● | | | | | | ERD12/16... Page D206 |
| | RDMW1606ZDSN | ● | | ● | | ● | | | | | | | |

## ● RDMW**M0

| Shape | Designation | Coating | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | | | | | | | | | | | |
|  | RDMW0501M0 | ● | | | | | | | | | | | EWD05/09/10... Page D210 |
| | RDMW0702M0 | ● | | | | | | | | | | | |
| | RDMW1003M0 | ● | | | | | | | | | | | HWD07... Page D210 |

## ● RFEN2004ZFTN, RFEN2004M0TN

| Shape | Designation | Coating | | | Uncoated | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | GH330 | | UX30 | KS20 | | | | | |
|  | RFEN2004ZFTN | ● | ● | | ● | ● | | | | | TRF6000 Page D167 |
| | RFEN2004M0TN | | ● | | ● | ● | | | | | ERF6000 Page D167 |

## ● RNGU1307ZNER-MJ

| Shape | Designation | Coating | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH3135 | | | | | | | | | | |
|  | RNGU1307ZNER-MJ | ● | ● | | | | | | | | | | DOTMILL TASN13... Page D120 |

● : Line-up

# Milling Inserts

## ● RPMT**EN-MJ, RPMT**EN-ML

| Shape | Designation | Coating | | | Applicable mills |
|---|---|---|---|---|---|
| | | AH130 | AH725 | AH4035 | |
|  -MJ | RPMT10T3EN-MJ | ● | ● | ● | FIXRMILL TRP10/12/16... Page D196 |
| | RPMT10T3EN-ML | ● | ● | ● | |
| | RPMT1204EN-MJ | ● | ● | ● | |
| | RPMT1204EN-ML | ● | ● | ● | ERP10/12/16... Page D196 |
| | RPMT1606EN-MJ | ● | ● | ● | |
|  -ML | RPMT1606EN-ML | ● | ● | ● | HRP10/12... Page D197 |

## ● SCMT**-23

| Shape | Designation | Coating | Applicable mills |
|---|---|---|---|
| | | AH120 | |
|  | SCMT09T308-23 | ● | EBD... Page D216 |
| | SCMT120408-23 | ● | HBD... Page D272 |

## ● SDCN42HTR, SDKN42HTR

| Shape | Designation | Coating | Applicable mills |
|---|---|---|---|
| | | GH330 | |
|  | SDCN42HTR | ● | EUD4600 (Former products) |
| | SDKN42HTR | ● | |

## ● SDKN42EF..., SDEN42EFTR24

| Shape | Designation | Coating | Cermet | Uncoated | | Applicable mills |
|---|---|---|---|---|---|---|
| | | T3130 | NS740 | TH10 | UX30 | |
|  | SDKN42EFTR | ● | ● | | | TMD4100I (Former products) |
| | SDKN42EFFR | | | ● | | |
| | SDEN42EFTR24 | | ● | | ● | |

●: Line-up

# Milling Insert

● **SDCN42Z..., SDEN42Z..., SDKN42Z..., SDCN42ZFN-DIA, SDKR42ZSR-MJ, SDMR1203AETN-MJ, SDKR1203AETN-MJ, SDKR42ZPN-MS**

| Shape | Designation | Coating | | | | | | | Cermet | | Uncoated | | PCD | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH130 | AH140 | AH330 | GH330 | T1115 | T3130 | NS740 | N308 | UX30 | TH10 | DX140 | | |
|  | **SDCN42ZFN** | | | | | | | | | | | ● | | | EMD4400RI<br>Page D152 |
| | **SDCN42ZTN** | | | | | | | | ● | ● | ● | | | | |
| | **SDCN42ZTN20** | | | | | | | | ● | | | | | | EGD4400<br>Page D157 |
| | **SDEN42ZFN** | | | | | | | | | | | ● | | | |
| | **SDEN42ZTN** | ● | | ● | | ● | ● | | ● | ● | ● | | | | |
| | **SDEN42ZTNCR** | ● | | ● | ● | | | | ● | | | | | | |
| | **SDEN42ZTN20** | | | | | | | ● | | | | | | | |
|  | **SDKN42ZFN** | | | | | | | | | | | ● | | | |
| | **SDKN42ZTN** | ● | ● | ● | ● | ● | ● | | ● | ● | ● | | | | |
| | **SDKN42ZTNCR** | | | | | | | | ● | | | | | | |
| -MJ | **SDKN42ZTN16** | | | | | | | ● | | | | | | | |
| | **SDCN42ZFN-DIA** | | | | | | | | | | | | ● | | |
| | **SDKR42ZSR-MJ** | ● | | | ● | ● | | ● | | | | | | | |
| | **SDMR1203AETN-MJ** | | | | | | | | ● | | | | | | |
| | **SDKR1203AETN-MJ** | | | | | | | | ● | | | | | | |
| | **SDKR42ZPN-MS** | | ● | ● | | | | | | | | | | | |

DX140：Packing quantity = 1pc.

●**SDCN53HTR, SDKN53HTR**

| Shape | Designation | Coating | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | GH330 | | | | | | | | | | | |
|  | **SDCN53HTR** | ● | | | | | | | | | | | TUD5600<br>(Former products) |
| | **SDKN53HTR** | ● | | | | | | | | | | | |

● **SDCN53ZTN, SDEN53Z..., SDKN53Z..., SDKR53ZSR-MJ**

| Shape | Designation | Coating | | | | | Cermet | | | Uncoated | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH130 | AH140 | GH330 | T3130 | NS740 | N308 | | UX30 | TH10 | |
|  | **SDCN53ZTN** | | | | | | ● | ● | | | | TMD5400RI<br>Page D155 |
| | **SDEN53ZFN** | | | | | | | | | | ● | |
| | **SDEN53ZTN** | | | | ● | | ● | | | ● | | |
| | **SDEN53ZTNCR** | | | | | | ● | | | | | |
| | **SDEN53ZTN20** | | | | | ● | | | | | | |
|  | **SDKN53ZFN** | | | | | | | | | | ● | |
| | **SDKN53ZTN** | ● | ● | ● | ● | | ● | ● | | ● | | |
| | **SDKN53ZTNCR** | | | | | | ● | | | | | |
| - MJ | **SDKN53ZTN16** | | | | | ● | | | | | | |
| | **SDKR53ZSR-MJ** | | | | ● | ● | | | | | | |

●：Line-up

# Milling Insert

## ● SDMT050204PN-MJ, SDHT050204FN-AJ

| Shape | Designation | Coating | | | Uncoated | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH140 | AH725 | | TH10 | | | | | | |
|  -MJ | SDMT050204PN-MJ | ● | ● | | | | | | | | TUNGQUAD TPD05... Page D070 EPD05... Page D070 ELD05... Page D070 |
| | SDHT050204FN-AJ | | | | ● | | | | | | |
|  -AJ | | | | | | | | | | | |

## ● SDMT1204AFPN-MJ, SDMT1204AFTN-MJ, SDMT1204AFPN-ML, SDMT1204AFPN-MS, SDGT1204AFTN-MJ, SDGT1204AFFN-AJ

| Shape | Designation | Coating | | | | | Cermet | | | Uncoated | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH140 | AH330 | GH330 | T3130 | NS740 | | | TH10 | | |
|  -MJ | SDMT1204AFPN-MJ | ● | ● | ● | ● | ● | | | | | | TAD12... EAD12... (Former products) |
| | SDMT1204AFTN-MJ | | | | | | ● | | | | | |
| | SDMT1204AFPN-ML | ● | | ● | | | | | | | | |
| | SDMT1204AFPN-MS | | ● | | | | | | | | | |
|  -AJ | SDGT1204AFTN-MJ | ● | | ● | | | ● | | | | | |
| | SDGT1204AFFN-AJ | | | | | | | | | ● | | |
| | | | | | | | | | | | | |

## ● SDMT1204PDSR-MJ, SDMT1204PDTR-MJ, SDMT1204PDPR-ML, SDMT1204PDPR-MS SDGT1204PDTR-MJ, SDGT1204PDFR-AJ

| Shape | Designation | Coating | | | | | Cermet | | | Uncoated | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH140 | AH330 | GH330 | T3130 | NS740 | | | TH10 | | |
|  -MJ | SDMT1204PDSR-MJ | ● | ● | ● | ● | ● | | | | | | TPD12... EPD12... (Former products) |
| | SDMT1204PDTR-MJ | | | | | | ● | | | | | |
| | SDMT1204PDPR-ML | ● | | ● | | | | | | | | |
| | SDMT1204PDPR-MS | | ● | | | | | | | | | |
|  -AJ | SDGT1204PDTR-MJ | ● | | ● | | | ● | | | | | |
| | SDGT1204PDFR-AJ | | | | | | | | | ● | | |
| | | | | | | | | | | | | |



● : Line-up

# Milling Insert

## ● SDMW090308TN, SDMW120408TN

| Shape | Designation | Uncoated | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | UX30 | | | | | | | | | | |
|  | SDMW090308TN | ● | | | | | | | | | | ELD3000 |
| | SDMW120408TN | ● | | | | | | | | | | ELD4000 (Former products) |

## ● SECN1203AGFN, SEEN1203AG..., SEKN1203AG..., SEKR1203AGSR-MJ, SEKR1203AGPN-MS

| Shape | Designation | Coating | | | | | | | Cermet | | Uncoated | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH130 | AH140 | AH330 | GH330 | T1115 | T3130 | NS740 | | UX30 | TH10 | |
|  | SECN1203AGFN | | | | | | | | | | | ● | TME4400R/LI Page D146 |
| | SEEN1203AGFN | | | | | | | | | | | ● | |
| | SEEN1203AGTN | ● | ● | ● | | ● | ● | | ● | | ● | | TME4400RB Page D147 |
| | SEEN1203AGTN-T | | | | | | | ● | ● | | ● | | |
| | SEEN1203AGTNCR | ● | ● | ● | ● | | | ● | | | | | EME4400 Page D148 |
|  | SEEN1203AGTNCR-14 | | | | | | | | ● | | | | |
| | SEKN1203AGFN-T | | | | | | | | | | | ● | |
| | SEKN1203AGTN | ● | ● | ● | ● | ● | | ● | ● | | ● | | |
| -MJ | SEKN1203AGTN-T | | | | | ● | ● | ● | ● | | ● | | |
| | SEKN1203AGTNCR | | | | | | | | ● | | | | |
|  | SEKR1203AGSR-MJ | ● | | | ● | ● | | ● | | | | | |
| | SEKR1203AGPN-MS | | ● | ● | | | | | | | | | |
| -MS | | | | | | | | | | | | | |

## ● SECN422TN, SECN422FN, SEEN422TN, SEEN422FN, SECN422FN-DIA

| Shape | Designation | ISO designation (Metric) | Cermet | | | | Uncoated | | | PCD | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | NS740 | N308 | | | UX30 | TH10 | | DX140 | | | | |
|  | SECN422TN | SECN120308TN | ● | ● | | | ● | | | | | | | EGE4000 (Former products) |
| | SECN422FN | SECN120308FN | | | | | | ● | | | | | | |
| | SEEN422TN | SEEN120308TN | ● | ● | | | ● | | | | | | | QHE4000 |
| | SEEN422FN | SEEN120308FN | | | | | | ● | | | | | | |
|  | SECN422FN-DIA | SECN120308FN-D | | | | | | | | ● | | | | |
| -DIA | | | | | | | | | | | | | | |

DX140: Packing quantity = 1pc.

●: Line-up

# Milling Insert

● **SEEN1203AFTNCR-14, SEKN42AFTN, SEKN42AFFN, SEKN42AFTN16, SEKR42AFSR-MJ, SEKR1203AFPN-MS, SEKR1203AFTN-MJ, SEMR1203AFTN-MJ**

| Shape | Designation | ISO designation (Metric) | Coating | | | | | Cermet | Uncoated | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | AH120 | AH130 | AH140 | GH330 | T3130 | NS740 | TH10 | UX30 | |
|  | **SEEN1203AFTNCR-14** | | | | | | | ● | | | TGE4400I |
| | **SEKN42AFTN** | **SEKN1203AFTN** | ● | ● | ● | ● | | | | ● | EGE4400 |
| | **SEKN42AFFN** | **SEKN1203AFFN** | | | | | | | ● | | (Former products) |
|  SEKR-MJ | **SEKN42AFTN16** | **SEKN1203AFTN-16** | | | | | ● | ● | | | |
| | **SEKR42AFSR-MJ** | **SEKR1203AFSR-MJ** | | | | ● | ● | | | | |
| | **SEKR1203AFPN-MS** | | | | ● | | | | | | |
| | **SEKR1203AFTN-MJ** | | | | | | | ● | | | |
|  SEMR-MJ | **SEMR1203AFTN-MJ** | | | | | | | ● | | | |
| | | | | | | | | | | | |

● **SECN42EFTRCR, SEEN42EFTRCR, SEKN42EFTR, SEKN42EFFR**

| Shape | Designation | ISO designation (Metric) | Coating | | | Cermet | | | Uncoated | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | GH330 | T3130 | | NS740 | | | UX30 | TH10 | | | |
|  | **SECN42EFTRCR** | **SECN1203EFTR** | | | | ● | | | | | | | EGE4100 |
| | **SEEN42EFTRCR** | **SEEN1203EFTR** | | | | ● | | | | | | | (Former products) |
| | **SEKN42EFTR** | **SEKN1203EFTR** | ● | ● | | ● | | | | | | | |
| | **SEKN42EFFR** | **SEKN1203EFFR** | | | | | | | | ● | | | |
| | | | | | | | | | | | | | |

Insert

●: Line-up

# Milling Insert

● **SEGW12X4ZEFR, SEGW12X4ZEPR, SEGT12X4ZEFR-AJ, SEGW12X4ZEFR-D, SEGW12X4ZEFR-WD, SEGW12X4ZEFR-BD**

| Shape | Designation | Coating | | | Cermet | | Uncoated | | PCD | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH140 | DS1100 | NS740 | | KS05F | | DX140 | | |
|  | **SEGW12X4ZEFR** | | | | | | ● | | | | EFE12R... Page D140 |
| | **SEGW12X4ZEPR** | ● | ● | | ● | | | | | | |
|  -AJ | **SEGT12X4ZEFR-AJ** | | | ● | | | ● | | | | |
| | **SEGW12X4ZEFR-D** | | | | | | | | ● | | |
|  -D (General insert) | **SEGW12X4ZEFR-WD** | | | | | | | | ● | | |
| | **SEGW12X4ZEFR-BD** | | | | | | | | ● | | |
|  -WD (Wiper insert) | | | | | | | | | | | |
|  -BD (Wiper insert) | | | | | | | | | | | |

DX140: Packing quantity = 1pc.

●**SEKR1504AFSR-MJ**

| Shape | Designation | Coating | | | | Applicable mills |
|---|---|---|---|---|---|---|
| | | T3130 | | | | |
|  | **SEKR1504AFSR-MJ** | ● | | | | (Former products) |

●: Line-up

# Milling Insert

● **SNCN43Z..., SNKF43Z..., SNKN43ZTN**

| Shape | Designation | Coating | | | Cermet | | | Ceramic | | Uncoated | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | T1115 | T3130 | | NS740 | N308 | | FX105 | | UX30 | TH10 | | |
|  | **SNCN43ZFN** | | | | | | | | | | ● | | TGN4200R-A Page D162 |
| | **SNCN43ZTN** | | | | ● | ● | | | | ● | | | |
| | **SNKF43ZFN** | | | | | | | | | | ● | | |
| | **SNKF43ZTN** | ● | | | | | | | | ● | | | |
| | **SNKN43ZTN** | ● | ● | | ● | | | ● | | ● | | | |

● **SNMU1706ANPR-MJ, SNHU1706ANPR-MJ, SNMU1706ANTR-ML, SNHU1706ANTR-ML, SNHU1706ANFN-W**

| Shape | Designation | Coating | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH140 | AH725 | AH3135 | T1215 | | | | | | | |
|  -ML | **SNMU1706ANPR-MJ** | | ● | ● | ● | ● | | | | | | | DOOCTO DOQUAD TAN07... Page D123 |
| | **SNHU1706ANPR-MJ** | | ● | ● | | | | | | | | | |
| | **SNMU1706ANTR-ML** | ● | | | ● | | | | | | | | |
|  -MJ | **SNHU1706ANTR-ML** | ● | | | | | | | | | | | |
| | **SNHU1706ANFN-W** | ● | | | | | | | | | | | |

● **SNEN12**Z...**

| Shape | Designation | Uncoated | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | UX30 | TH10 | | | | | | | | | | |
|  | **SNEN12T2ZFN** | | ● | | | | | | | | | | SVN4000 Page D185 |
| | **SNEN12T2ZTN** | ● | | | | | | | | | | | |
| | **SNEN1233ZFN** | | ● | | | | | | | | | | |
| | **SNEN1233ZTN** | ● | | | | | | | | | | | |



● : Line-up

# Milling Insert

## ● SNGU1307ANEN-MJ, SNGU1307ANEN-W, SNGU1307ANEN-MH

| Shape | Designation | Coating | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH3135 | T3225 | | | | | | | | |
|  -MJ | SNGU1307ANEN-MJ | ● | ● | ● | | | | | | | | DOTMILL TASN13... Page D120 |
| | SNGU1307ANEN-W | ● | ● | | | | | | | | | |
|  -W | SNGU1307ANEN-MH | | | ● | | | | | | | | |
|  -MH | | | | | | | | | | | | |

## ● SNMN1204**TN

| Shape | Designation | Coating | | | Ceramic | | Uncoated | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | T1115 | T3130 | FX105 | | UX30 | | | | |
|  | SNMN120408TN | | | | ● | | | | | | TGN4200R-A Page D162 |
| | SNMN120412TN | ● | ● | ● | ● | | ● | | | | |
| | SNMN120416TN | | | | ● | | | | | | |
| | SNMN120420TN | | | | ● | | | | | | |
| | SNMN120424TN | | | | ● | | | | | | |

## ● SPCN42..., SPEN42..., SPKN42..., SPKR42SSR-MJ, SPGN120312TN

| Shape | Designation | Coating | | | | | Cermet | | Ceramic | Uncoated | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH140 | GH330 | T1115 | T3130 | NS740 | N308 | FX105 | UX30 | TH10 | |
|  | SPCN42STR | | | | | | ● | ● | | ● | | TGP4100RBAE Page D160 |
| | SPCN42SFR | | | | | | | | | | ● | |
| | SPEN42STR | | | | | | ● | | | | | |
| | SPKN42STR | ● | ● | ● | ● | ● | ● | ● | ● | ● | | |
|  | SPKN42STL | | | | | | ● | | | ● | | |
| | SPKN42SFR | | | | | | | | | | ● | |
| | SPKN42SFL | | | | | | | | | | ● | |
| | SPKR42SSR-MJ | | | ● | ● | ● | | | | | | |
| | SPGN120312TN | | | | | | | | ● | | | |
|  -MJ | SPEN423TN | | | | | ● | ● | | | ● | | |
| | SPEN423FN | | | | | | | | | | ● | |
| | | | | | | | | | | | | |

●: Line-up

# Milling Insert

## ● SPGN120412TN

| Shape | Designation | Coating | Ceramic | | Applicable mills |
|---|---|---|---|---|---|
| | | T1115 | FX105 | | |
|  | SPGN120412TN | ● | ● | | QFP4000 (Former products) |

## ● SPHA**FNW

| Shape | Designation | Cermet | Uncoated | | Applicable mills |
|---|---|---|---|---|---|
| | | N308 | TH10 | | |
|  | SPHA431FNW | ● | ● | | SFP4000R Page D170 |
| | SPHA435FNW | ● | ● | | EFP4000R Page D170 |

## ● SPMA422...

| Shape | Designation | Cermet | | Uncoated | | | Applicable mills |
|---|---|---|---|---|---|---|---|
| | | NS740 | N308 | UX30 | TH10 | | |
|  | SPMA422TN | ● | ● | ● | | | ECP4400R Page D262 |
| | SPMA422FN | | | | ● | | |

## ● SPMP..., SPMM**ERD

| Shape | Designation | Coating | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|
| | | T313W | | | | | |
|  | SPMP831DS | ● | | | | | TCB... Page D263 |
| | SPMP042ERD | ● | | | | | |
| | SPMM322ERD | ● | | | | | |
| | SPMM432ERD | ● | | | | | |



● : Line-up

# Milling Insert

## ● SPMR1605PPTR-MJ, SPMR1605PPPR-ML, SPMR1605PPTR-MH

| Shape | Designation | Coating | | | Uncoated | | Applicable mills |
|---|---|---|---|---|---|---|---|
| | | GH330 | T1115 | T3130 | UX30 | | |
|  -MJ | **SPMR1605PPTR-MJ** | ● | ● | ● | ● | | TPP16... Page D108 |
| | **SPMR1605PPPR-ML** | ● | | | | | |
|  -ML | **SPMR1605PPTR-MH** | ● | | ● | ● | | |

## ● SQMU1206ZSR-MJ

| Shape | Designation | Coating | | | | Applicable mills |
|---|---|---|---|---|---|---|
| | | AH120 | AH130 | AH725 | T3130 | |
|  | **SQMU1206ZSR-MJ** | ● | ● | ● | ● | DOFEEDQUAD TXQ... Page D021 |

## ● SSM..., SSS...

| Shape | Designation | Coating | Applicable mills |
|---|---|---|---|
| | | GH130 | |
|  SSM | **SSM22N** | ● | TUNGMILL S/ASG... Page D174 |
| | **SSM31N** | ● | |
| | **SSM41N** | ● | |
| | **SSS16N** | ● | |
| | **SSS22N** | ● | |
| | **SSS31N** | ● | |
|  SSS | **SSS41N** | ● | |

●: Line-up

# Milling Insert

● **SWMT13T3AFPR-MJ, SWMT13T3AFER-ML, SWMW13T3AFTR, SWMT13T3AFPR-HJ, SWMT13T3AFPR-MS, SWGT13T3AFPR-MJ, SWGT13T3AFFR-AJ**

| Shape | Designation | Coating | | | | | | | | | Cermet | | Uncoated | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH130 | AH140 | AH3135 | T1115 | T1215 | T3130 | DS1100 | | NS740 | | KS05F | | |
|  -MJ | **SWMT13T3AFPR-MJ** | ● | ● | ● | ● | ● | ● | ● | | | ● | | | | TUNGMILL |
| | **SWMT13T3AFER-ML** | ● | | | | | | | | | | | | | TAW13... Page D133 |
| | **SWMW13T3AFTR** | ● | | | | ● | ● | ● | | | ● | | | | EAW13... Page D134 |
| | **SWMT13T3AFPR-HJ** | ● | ● | ● | | ● | ● | ● | | | | | | | |
|  -ML | **SWMT13T3AFPR-MS** | | ● | ● | ● | | | | | | | | | | |
| | **SWGT13T3AFPR-MJ** | ● | | | | | | | | | ● | | | | |
| | **SWGT13T3AFFR-AJ** | | | | | | | | ● | | | | ● | | |
|  -FL | | | | | | | | | | | | | | | |
|  -HJ | | | | | | | | | | | | | | | |
|  -MS | | | | | | | | | | | | | | | |
|  -AJ | | | | | | | | | | | | | | | |
|  SWGT-MJ | | | | | | | | | | | | | | | |



●: Line-up

# Milling Insert

● **SWMT1304PDPR-MJ, SWMT1304PDER-ML, SWMT1304PDPR-MS, SWGT1304PDPR-MJ, SWGT1304PDFR-AJ**

| Shape | Designation | Coating | | | | | | | Cermet | | Uncoated | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH130 | AH140 | T1115 | T1215 | T3130 | DS1100 | NS740 | | KS05F | | |
|  SWMT1304-MJ | **SWMT1304PDPR-MJ** | ● | ● | ● | ● | ● | ● | | ● | | | | TUNGMILL TPW13... Page D074 |
| | **SWMT1304PDER-ML** | ● | | | | | | | | | | | |
| | **SWMT1304PDPR-MS** | | ● | ● | | | | | | | | | |
| | **SWGT1304PDPR-MJ** | ● | | | | | | | ● | | | | EPW13... Page D075 |
| | **SWGT1304PDFR-AJ** | | | | | | | ● | | | ● | | |
|  SWMT1304-ML | | | | | | | | | | | | | |
|  SWMT1304-MS | | | | | | | | | | | | | |
|  SWGT1304-MJ | | | | | | | | | | | | | |
|  SWGT1304-AJ | | | | | | | | | | | | | |

● **SWMT1506ZER-MJ**

| Shape | Designation | Coating | | | Applicable mills |
|---|---|---|---|---|---|
| | | AH120 | AH3135 | | |
|  | **SWMT1506ZER-MJ** | ● | ● | | MILLQFEED TXSW... Page D024 |

● **T*-R...**

| Shape | Designation | Coating | | | Applicable mills |
|---|---|---|---|---|---|
| | | GH330 | | | |
|  | **T1-R14** | ● | | | Single tooth threading mills Page D265 |
| | **T1-R28** | ● | | | |
| | **T2-R14** | ● | | | |
| | **T2-R28** | ● | | | |

●: Line-up

# Milling Insert

## ● TCGT160608PDER-MJ, TCMT160620PDER-NMJ

| Shape | Designation | Coating | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH3135 | | | | | | | | | | |
|  -MJ | TCGT160608PDER-MJ | ● | ● | | | | | | | | | | TUNG-TRISHRED LPTC16... Page D047 TPTC16... Page D047 EPTC16... Page D048 |
| | TCMT160620PDER-NMJ | ● | ● | | | | | | | | | | |
|  -NMJ | | | | | | | | | | | | | |

## ●TDMN**N

| Shape | Designation | Cermet | | | Uncoated | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NS740 | | | TH10 | UX30 | | | | | | | |
|  | TDMN110304TN | ● | | | | ● | | | | | | | ESD2000 (Former products) |
| | TDMN110304FN | | | | ● | | | | | | | | |
| | TDMN110308TN | ● | | | | ● | | | | | | | |
| | | | | | | | | | | | | | |

## ● TECN32...,TEEN32..., TECN32ZFR-DIA, TEKR1603PEPR-MS

| Shape | Designation | Coating | | | | | | | Cermet | | Uncoated | | PCD | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH130 | AH140 | AH330 | GH330 | T1115 | T3130 | NS740 | N308 | UX30 | TH10 | DX140 | | |
|  | TECN32ZFR | | | | | | | | | | | ● | | | TSE3000R Page D110 |
| | TECN32ZTR | | | | | | | | ● | ● | ● | | | | ESE3000R Page D110 |
| | TEEN32ZFR | | | | | | | | | | | ● | | | |
| | TEEN32ZTR | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | |
|  -DIA | TECN32ZFR-DIA | | | | | | | | | | | | ● | | |
| | TEKR1603PEPR-MS | | | ● | | | | | | | | | | | |
|  -MS | | | | | | | | | | | | | | | |

DX140: Packing quantity = 1pc.



●: Line-up

# Milling Insert

## ● TECN43..., TEEN43..., TECN43ZFR-DIA, TEKR2204PEPR-MS

| Shape | Designation | Coating | | | | | | | Cermet | | Uncoated | | PCD | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH130 | AH140 | AH330 | GH330 | T1115 | T3130 | NS740 | N308 | UX30 | TH10 | DX140 | | |
|  | **TECN43ZFR** | | | | | | | | | | | ● | | | TSE4000RIA Page D113 |
| | **TECN43ZTR** | | | | | | | | ● | ● | ● | | | | |
| | **TEEN43ZFR** | | | | | | | | | | | ● | | | ESE4000R Page D114 |
| | **TEEN43ZTR** | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | |
|  -DIA | **TECN43ZFR-DIA** | | | | | | | | | | | | ● | | |
| | **TEKR2204PEPR-MS** | | | ● | | | | | | | | | | | |
|  -MS | | | | | | | | | | | | | | | |

DX140: Packing quantity = 1pc.

## ● TNGU120708PER-MJ, TNGU120708PER-NMJ, TNMU1207R16PER-MJ

| Shape | Designation | Coating | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH3135 | | | | | | | | | | |
|  TNGU-MJ | **TNGU120708PER-MJ** | ● | ● | | | | | | | | | | DOFTRI TPTN12... Page D034 |
|  TNGU-NMJ | **TNGU120708PER-NMJ** | ● | ● | | | | | | | | | | EPTN12... Page D034 |
|  TNMU-MJ | **TNMU1207R16PER-MJ** | ● | ● | | | | | | | | | | |

● : Line-up

# Milling Insert

## ●TNKF64ZTR

| Shape | Designation | Uncoated | Applicable mills |
|---|---|---|---|
| | | UX30 | |
|  | **TNKF64ZTR** | ● | TPN6400I (Former products) |

## ●TNMN43ZENS

| Shape | Designation | Uncoated | Applicable mills |
|---|---|---|---|
| | | UX30 | |
|  | **TNMN43ZENS** | ● | TSN4000 ESN4000 (Former products) |

## ● TOMT**PDER-MJ, TOMT150608PDER-NMJ

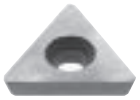
| Shape | Designation | Coating | | | Applicable mills |
|---|---|---|---|---|---|
| | | AH120 | AH3135 | T1215 | |
|  -MJ | **TOMT060302PDER-MJ** | ● | ● | | TUNG-TRI |
| | **TOMT060304PDER-MJ** | ● | ● | | TPA06... Page D038 |
| | **TOMT060308PDER-MJ** | ● | ● | ● | EPA06... Page D038 |
| | **TOMT100404PDER-MJ** | ● | ● | | HPA06... Page D039 |
| | **TOMT100408PDER-MJ** | ● | ● | ● | TPA10... Page D039 |
| | **TOMT100416PDER-MJ** | ● | ● | | TLA10... Page D040 |
| | **TOMT150604PDER-MJ** | ● | ● | | EPA10... Page D040 |
|  -NMJ | **TOMT150608PDER-MJ** | ● | ● | ● | HPA10... Page D041 |
| | **TOMT150616PDER-MJ** | ● | ● | | TPA15... Page D041 |
| | **TOMT150620PDER-MJ** | ● | ● | | TLA15... Page D042 |
| | **TOMT150608PDER-NMJ** | ● | ● | | EPA15... Page D043 |



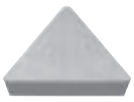
●: Line-up

# Milling Insert

## ● TPCA43ZTRW1, TPMA432TNW1

| Shape | Designation | Cermet | | | Uncoated | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NS740 | | | UX30 | TH10 | | | | | |
|  | TPCA43ZTRW1 | | | | | ● | | | | | PES1500... Page D104 |
| | TPMA432TNW1 | ● | | | ● | ● | | | | | |

## ●TPMN**TN

| Shape | Designation | Cermet | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NS740 | | | | | | | | | |
|  | TPMN110304TN | ● | | | | | | | | | (Former products) |
| | TPMN110308TN | ● | | | | | | | | | |
| | TPMN160308TN | ● | | | | | | | | | |
| | TPMN160312TN | ● | | | | | | | | | |
| | TPMN220408TN | ● | | | | | | | | | |
| | TPMN220412TN | ● | | | | | | | | | |

## ● TVKX**TN-MJ

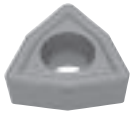
| Shape | Designation | Coating | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH130 | AH725 | | | | | | | |
|  | TVKX020202TN-MJ | ● | | ● | | | | | | | TUNGTSLIT ASV 02/03/04/05... Page D177 |
| | TVKX020204TN-MJ | ● | | ● | | | | | | | |
| | TVKX03X302TN-MJ | ● | | ● | | | | | | | |
| | TVKX03X304TN-MJ | ● | | ● | | | | | | | |
| | TVKX04H304TN-MJ | ● | ● | ● | | | | | | | |
| | TVKX04H308TN-MJ | ● | ● | ● | | | | | | | |
| | TVKX050404TN-MJ | ● | ● | ● | | | | | | | |
| | TVKX050408TN-MJ | ● | ● | ● | | | | | | | |



●: Line-up

# Milling Insert

## ● WCMT**-D4

| Shape | Designation | Coating | | Applicable mills |
|---|---|---|---|---|
| | | AH120 | AH140 | |
|  | WCMT050308-D4 | ● | ● | EVX... Page D257 |
| | WCMT06T308-D4 | ● | ● | HVX... Page D269 |

## ● WDCN42ZFR-DIA

| Shape | Designation | PCD | Applicable mills |
|---|---|---|---|
| | | DX140 | |
|  Wiper insert | WDCN42ZFR-DIA | ● | TMD4400R/LI<br>EMD4400RI Page D152<br>TGD4400-A<br>EGD4400 Page D157 |

DX140: Packing quantity = 1pc.

## ● WNGU**TN-MJ

| Shape | Designation | Coating | | | Applicable mills |
|---|---|---|---|---|---|
| | | AH120 | AH130 | AH725 | |
|  | WNGU060308TN-MJ | ● | ● | ● | TUNGUSLOT<br>ASW 06/07/09... Page D179<br>TSW 06/07/09... Page D180 |
| | WNGU060316TN-MJ | ● | ● | ● | |
| | WNGU07T308TN-MJ | ● | ● | ● | |
| | WNGU07T316TN-MJ | ● | ● | ● | |
| | WNGU090408TN-MJ | ● | ● | ● | |
| | WNGU090416TN-MJ | ● | ● | ● | |



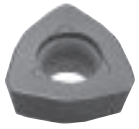
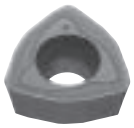
● : Line-up

# Milling Insert

● **WPAN42...**

| Shape | Designation | Cermet | | | Uncoated | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N308 | | | TH10 | | | | | | |
|  Wiper insert (Two corner type) | **WPAN42SFR** | ● | | | ● | | | | | | TGP4100RBAE Page D160 |
| | **WPAN42SFRS** | | | | ● | | | | | | |
|  Wiper insert (One corner type) | | | | | | | | | | | |

● **WPMT**ZPR..., WPMT**ZPR-ML, WPMT**-MH, WPMT**-DML, WPMW**-ZSR**

| Shape | Designation | Coating | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH130 | AH140 | AH730 | T3130 | | | | | |
|  | **WPMW05H315ZPR** | ● | | ● | | ● | | | | | MILLFEED TXP05/06/08/09... Page D026 EXP05/06/08/09... Page D027 |
| | **WPMT05H315ZPR-ML** | ● | | ● | | ● | | | | | |
| | **WPMT05H315ZPR-MH** | ● | | ● | | | | | | | |
| | **WPMT05H315ZPR-DML** | | | | ● | | | | | | |
| | **WPMW06X415ZPR** | ● | | ● | | ● | | | | | |
|  -ML | **WPMT06X415ZPR-ML** | ● | ● | ● | | ● | | | | | |
| | **WPMT06X415ZPR-MH** | ● | | ● | | | | | | | |
| | **WPMT06X415ZPR-DML** | | | | ● | | | | | | |
| | **WPMT080615ZSR** | ● | ● | ● | | ● | | | | | HXP... Page D268 |
| | **WPMT080615ZPR-ML** | ● | ● | ● | | ● | | | | | |
|  -MH | **WPMT080615ZSR-MH** | ● | | ● | | | | | | | |
| | **WPMT080615ZPR-DML** | | | | ● | | | | | | |
| | **WPMT090725ZSR** | ● | | ● | | ● | | | | | |
| | **WPMT090725ZPR-ML** | ● | ● | ● | | ● | | | | | |
| | **WPMT090725ZSR-MH** | ● | ● | ● | | | | | | | |
|  -DML | **WPMT090725ZPR-DML** | | | | ● | | | | | | |

●: Line-up

# Milling Insert

## ● WWCW13T3AFER-WS, WWCW13T3AFFR-WS, WWCW13T3AFFR-WD

| Shape | Designation | Coating | | | Cermet | | | Uncoated | | | PCD | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | GH110 | DS1100 | | NS740 | | | KS05F | | | DX140 | | | |
|   -WD | WWCW13T3AFER-WS | ● | | | ● | | | | | | | | | TUNGMILL TAW13... Page D133 EAW13... Page D134 |
| | WWCW13T3AFFR-WS | | ● | | | | | ● | | | | | | |
| | WWCW13T3AFFR-WD | | | | | | | | | | ● | | | |

DX140: Packing quantity = 1pc.

## ● WXHU**R-MJ

| Shape | Designation | Coating | | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH110 | | | | | | | | | | | | |
|  | WXHU040305R-MJ | ● | | | | | | | | | | | | DOMMILL HFWX04... Page D195 |
| | WXHU040310R-MJ | ● | | | | | | | | | | | | |

Insert

●: Line-up

# Milling Insert

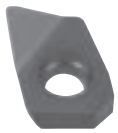
● **XCET310404ER**

| Shape | Designation | Coating | | | Cermet | | | Uncoated | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH330 | | | NS740 | | | UX30 | | | | |
|  | **XCET310404ER** | ● | | | ● | | | ● | | | | ECC31... Page D260 |

● **XVCT16**R-AJ**

| Shape | Designation | Uncoated | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | TH10 | | | | | | | | | | |
|  | **XVCT160504R-AJ** | ● | | | | | | | | | | TUNG-ALUMILL<br>TPV16...<br>Page D086<br>EPV16...<br>Page D086 |
| | **XVCT160508R-AJ** | ● | | | | | | | | | | |
| | **XVCT160512R-AJ** | ● | | | | | | | | | | |
| | **XVCT160516R-AJ** | ● | | | | | | | | | | |
| | **XVCT160520R-AJ** | ● | | | | | | | | | | |
| | **XVCT160530R-AJ** | ● | | | | | | | | | | |
| | **XVCT160532R-AJ** | ● | | | | | | | | | | |
| | **XVCT160540R-AJ** | ● | | | | | | | | | | |
| | **XVCT160550R-AJ** | ● | | | | | | | | | | |

● **XVGT**EC-MJ, XVGT**FP-MJ, XVGT**FC-AJ, XVGT**FP-AJ**

| Shape | Designation | Coating | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH730 | DS1200 | | | | | | | | | |
|  <br>Center edge insert | **XVGT06H205EC-MJ** | ● | | | | | | | | | | HYBRIDTACMILL<br>EVH... Page D254 |
| | **XVGT07X305EC-MJ** | ● | | | | | | | | | | |
| | **XVGT09X405EC-MJ** | ● | | | | | | | | | | |
| | **XVGT06H205EP-MJ** | ● | | | | | | | | | | |
| | **XVGT07X305EP-MJ** | ● | | | | | | | | | | |
| | **XVGT09X405EP-MJ** | ● | | | | | | | | | | |
|  <br>Peripheral edge insert | **XVGT06H205FC-AJ** | | ● | | | | | | | | | |
| | **XVGT07X305FC-AJ** | | ● | | | | | | | | | |
| | **XVGT09X405FC-AJ** | | ● | | | | | | | | | |
| | **XVGT06H205FP-AJ** | | ● | | | | | | | | | |
| | **XVGT07X305FP-AJ** | | ● | | | | | | | | | |
| | **XVGT09X405FP-AJ** | | ● | | | | | | | | | |

●: Line-up

# Milling Insert

● **XHGR**ER-MJ, XHGR**FR-AJ**

| Shape | Designation | Coating AH730 | Coating DS1200 | Applicable mills |
|---|---|---|---|---|
|  | XHGR110202ER-MJ | ● | | HYBRIDTACMILL EPH11/13/18... Page D089 |
| | XHGR110204ER-MJ | ● | | |
| | XHGR110205ER-MJ | ● | | |
| | XHGR110208ER-MJ | ● | | |
| | XHGR110210ER-MJ | ● | | |
| | XHGR110212ER-MJ | ● | | |
| | XHGR110215ER-MJ | ● | | |
| | XHGR110216ER-MJ | ● | | |
| | XHGR110220ER-MJ | ● | | |
| | XHGR130202ER-MJ | ● | | |
| | XHGR130204ER-MJ | ● | | |
| | XHGR130205ER-MJ | ● | | |
| | XHGR130208ER-MJ | ● | | |
| | XHGR130210ER-MJ | ● | | |
| | XHGR130212ER-MJ | ● | | |
| | XHGR130215ER-MJ | ● | | |
| | XHGR130216ER-MJ | ● | | |
| | XHGR130220ER-MJ | ● | | |
| | XHGR18T202ER-MJ | ● | | |
| | XHGR18T204ER-MJ | ● | | |
| | XHGR18T205ER-MJ | ● | | |
| | XHGR18T208ER-MJ | ● | | |
| | XHGR18T210ER-MJ | ● | | |
| | XHGR18T212ER-MJ | ● | | |
| | XHGR18T215ER-MJ | ● | | |
| | XHGR18T216ER-MJ | ● | | |
| | XHGR18T220ER-MJ | ● | | |
| | XHGR110200FR-AJ | | ● | |
| | XHGR110202FR-AJ | | ● | |
| | XHGR110204FR-AJ | | ● | |
| | XHGR110205FR-AJ | | ● | |
| | XHGR110208FR-AJ | | ● | |
| | XHGR110210FR-AJ | | ● | |
| | XHGR110212FR-AJ | | ● | |
| | XHGR110215FR-AJ | | ● | |
| | XHGR110216FR-AJ | | ● | |
| | XHGR110220FR-AJ | | ● | |
| | XHGR130200FR-AJ | | ● | |
| | XHGR130202FR-AJ | | ● | |
| | XHGR130204FR-AJ | | ● | |
| | XHGR130205FR-AJ | | ● | |
| | XHGR130208FR-AJ | | ● | |
| | XHGR130210FR-AJ | | ● | |
| | XHGR130212FR-AJ | | ● | |
| | XHGR130215FR-AJ | | ● | |
| | XHGR130216FR-AJ | | ● | |
| | XHGR130220FR-AJ | | ● | |
| | XHGR18T200FR-AJ | | ● | |
| | XHGR18T202FR-AJ | | ● | |
| | XHGR18T204FR-AJ | | ● | |
| | XHGR18T205FR-AJ | | ● | |
| | XHGR18T208FR-AJ | | ● | |
| | XHGR18T210FR-AJ | | ● | |
| | XHGR18T212FR-AJ | | ● | |
| | XHGR18T215FR-AJ | | ● | |
| | XHGR18T216FR-AJ | | ● | |
| | XHGR18T220FR-AJ | | ● | |

Insert

●: Line-up

# Milling Insert

● **XXGT**EC-MJ, XXGT**EP-MJ, XXGT**FC-AJ, XXGT**FP-AJ**

| Shape | Designation | Coating | | | Applicable mills |
|---|---|---|---|---|---|
| | | AH730 | DS1200 | | |
|  EC-MJ, FC-AJ | XXGT06H205EC-MJ | ● | | | HYBRIDTACMILL EXH... Page D004 |
| | XXGT07X305EC-MJ | ● | | | |
| | XXGT09X408EC-MJ | ● | | | |
| | XXGT06H205FC-AJ | | ● | | |
| | XXGT07X305FC-AJ | | ● | | |
| | XXGT09X408FC-AJ | | ● | | |
|  EP-MJ, FP-AJ | XXGT06H205EP-MJ | ● | | | |
| | XXGT07X305EP-MJ | ● | | | |
| | XXGT09X408EP-MJ | ● | | | |
| | XXGT06H205FP-AJ | | ● | | |
| | XXGT07X305FP-AJ | | ● | | |
| | XXGT09X408FP-AJ | | ● | | |

● **XXMU**PR-MJ**

| Shape | Designation | Coating | | | Applicable mills |
|---|---|---|---|---|---|
| | | AH120 | AH140 | | |
|  | XXMU08T204PR-MJ | ● | ● | | EVX... Page D257 |
| | XXMU10H308PR-MJ | ● | ● | | HVX... Page D269 |
| | XXMU12X408PR-MJ | ● | ● | | |
| | XXMU16X508PR-MJ | ● | ● | | |



●: Line-up

# Milling Insert

## ● YDEN0905PDFR-D, YDEN0905PDFR-WD, YDEN0905PDFR-BD

| Shape | Designation | PCD | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|
| | | DX140 | | | | | | | | |
|  General insert | YDEN0905PDFR-D | ● | | | | | | | | EDPD09... Page D143 |
| | YDEN0905PDFR-WD | ● | | | | | | | | |
| | YDEN0905PDFR-BD | ● | | | | | | | | |
|  Wiper insert | | | | | | | | | | |
|  Wiper insert | | | | | | | | | | |

DX140: Packing quantity = 1pc.

## ● YDEN1505PDFR-D, YDEN1505PDFR-WD

| Shape | Designation | PCD | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|
| | | DX140 | | | | | | | | |
|  General insert | YDEN1505PDFR-D | ● | | | | | | | | EDPD15... |
| | YDEN1505PDFR-WD | ● | | | | | | | | |
|  Wiper insert | | | | | | | | | | |

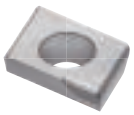
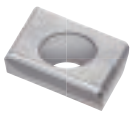
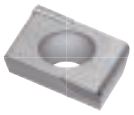
DX140: Packing quantity = 1pc.



●: Line-up

# Milling Insert

● **YPEB12X3-1A**-D, YPEB12X3-1P**-D, YPEB12X3-2A**-D, YPEB12X3-FP**-D, YPEB12X3-2P07R-D**

| Shape | Designation | PCD | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|
| | | DX160 | | | | | | | | |
|  -1A/P | **YPEB12X3-1A01R-D** | ● | | | | | | | | TUNGSMILL TPYP12... Page D138 EPYP12... Page D138 |
| | **YPEB12X3-1A02R-D** | ● | | | | | | | | |
| | **YPEB12X3-1A07R-D** | ● | | | | | | | | |
| | **YPEB12X3-1P02R-D** | ● | | | | | | | | |
| | **YPEB12X3-1P07R-D** | ● | | | | | | | | |
|  -FP | **YPEB12X3-FP02R-D** | ● | | | | | | | | |
| | **YPEB12X3-FP07R-D** | ● | | | | | | | | |
| | **YPEB12X3-2A01R-D** | ● | | | | | | | | |
| | **YPEB12X3-2A02R-D** | ● | | | | | | | | |
| | **YPEB12X3-2A07R-D** | ● | | | | | | | | |
|  -2A/P | **YPEB12X3-2P07R-D** | ● | | | | | | | | |

DX160: Packing quantity = 2pcs.



●: Line-up

# Milling Insert

## ●ZDCA**TN

| Shape | Designation | Uncoated | | Applicable mills |
|---|---|---|---|---|
| | | UX30 | | |
|  | ZDCA0804TN | ● | | TBF1000 (Former products) |
| | ZDCA1105TN | ● | | |

## ● ZDMT**-MJ

| Shape | Designation | Coating | Applicable mills |
|---|---|---|---|
| | | AH120 | |
|  | ZDMT4005-MJ | ● | EBD... Page D216 |
| | ZDMT5006-MJ | ● | HBD... Page D272 |

## ● ZFBM**-MJ, ZFRM**-MJ

| Shape | Designation | Coating | | Applicable mills |
|---|---|---|---|---|
| | | AH710 | AH725 | |
|  ZFBM-MJ | ZFBM080R00-MJ | ● | ● | BALL FNOSE |
| | ZFBM100R00-MJ | ● | ● | EBFM... Page D190 |
| | ZFBM120R00-MJ | ● | ● | HBFM... Page D191 |
| | ZFBM160R00-MJ | ● | ● | |
| | ZFBM200R00-MJ | ● | ● | |
| | ZFBM250R00-MJ | ● | ● | |
| | ZFBM300R00-MJ | ● | ● | |
| | ZFBM320R00-MJ | ● | ● | |
|  ZFRM-MJ | ZFRM120R05-MJ | ● | ● | |
| | ZFRM120R10-MJ | ● | ● | |
| | ZFRM160R05-MJ | ● | ● | |
| | ZFRM160R10-MJ | ● | ● | |
| | ZFRM160R15-MJ | ● | ● | |
| | ZFRM200R10-MJ | ● | ● | |
| | ZFRM200R15-MJ | ● | ● | |



●: Line-up

# Milling Insert

## ● ZNCA**FN, ZNMM**EN, ZNCA1002FN2

| Shape | Designation | Uncoated | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | UX30 | TH10 | | | | | | | | |
|  | ZNCA1002FN2 | ● | ● | | | | | | | | TBN1000 Page D212 |
| | ZNCA1203FN | ● | ● | | | | | | | | |
| | ZNCA1603FN | ● | ● | | | | | | | | |
| | ZNCA2004FN | ● | ● | | | | | | | | |
| | ZNCA2505FN | ● | ● | | | | | | | | |
| | ZNCA3005FN | ● | ● | | | | | | | | |
| | ZNMM2004EN | ● | | | | | | | | | |
| | ZNMM2505EN | ● | | | | | | | | | |
| | ZNMM3005EN | ● | | | | | | | | | |

## ● ZPET**-MJ

| Shape | Designation | Coating | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH330 | | | | | | | | |
|  | ZPET2004-MJ | ● | ● | | | | | | | | EBP... Page D214 |
| | ZPET2505-MJ | ● | ● | | | | | | | | HBP... Page D271 |
| | ZPET3006-MJ | ● | ● | | | | | | | | |
| | ZPET3206-MJ | ● | ● | | | | | | | | |

## ● ZPCW**-QBN

| Shape | Designation | T-CBN | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | BX950 | | | | | | | | | |
|  | ZPCW2003-QBN | ● | | | | | | | | | EBB... Page D215 |
| | ZPCW25H3-QBN | ● | | | | | | | | | |
| | ZPCW30T3-QBN | ● | | | | | | | | | |
| | ZPCW4004-QBN | ● | | | | | | | | | |
| | ZPCW5004-QBN | ● | | | | | | | | | |

BX950: Packing quantity = 1pc.

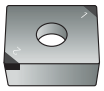
●: Line-up

# Milling Insert CBN

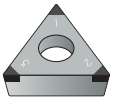
● **2QP-SNGN..**

| Shape | Designation | CBN | Applicable mills |
|---|---|---|---|
| | | BX910 | |
|  | **2QP-SNGN090308** | ● | |
| | **2QP-SNGN090312** | ● | |

● **2QP-SPGW..., 2QP-SPGN...**

| Shape | Designation | CBN | Applicable mills |
|---|---|---|---|
| | | BX910 | |
|  2QP-SPGW | **2QP-SPGW09T308** | ● | |
| | **2QP-SPGW09T312** | ● | |
| | **2QP-SPGW120408** | ● | |
| | **2QP-SPGW120412** | ● | |
| | **2QP-SPGW120416** | ● | |
|  2QP-SPGN | **2QP-SPGN090308** | ● | |
| | **2QP-SPGN090312** | ● | |

● **3QP-TPGW..., 3QP-TPGN...**

| Shape | Designation | CBN | Applicable mills |
|---|---|---|---|
| | | BX910 | |
|  3QP-TPGW | **3QP-TPGW110308** | ● | |
| | **3QP-TPGN110308** | ● | |
| | **3QP-TPGN110312** | ● | |
|  3QP-TPGN | | | |



● : Line-up

# Milling Insert CBN

● **S-CNGN..., S-RNGN..., S-SNGN..., S-TNGN...**

| Shape | Designation | CBN | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|
| | | BXC90 | | | | | | | | |
|  S-CNGN | **S-CNGN090308** | ● | | | | | | | | |
| | **S-CNGN090312** | ● | | | | | | | | |
| | **S-CNGN120408** | ● | | | | | | | | |
| | **S-CNGN120412** | ● | | | | | | | | |
|  S-RNGN | **S-RNGN090300** | ● | | | | | | | | |
| | **S-RNGN120400** | ● | | | | | | | | |
|  S-SNGN | **S-SNGN090308** | ● | | | | | | | | |
| | **S-SNGN090312** | ● | | | | | | | | |
| | **S-SNGN120308** | ● | | | | | | | | |
| | **S-SNGN120312** | ● | | | | | | | | |
| | **S-SNGN120408** | ● | | | | | | | | |
| | **S-SNGN120412** | ● | | | | | | | | |
|  S-TNGN | **S-TNGN110308** | ● | | | | | | | | |
| | **S-TNGN110312** | ● | | | | | | | | |
| | **S-TNGN160408** | ● | | | | | | | | |
| | **S-TNGN160412** | ● | | | | | | | | |
| | | | | | | | | | | |



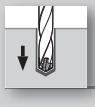
●: Line-up

MEMO

# DrillLine



# DRILLING


 2 Effective Drill E004

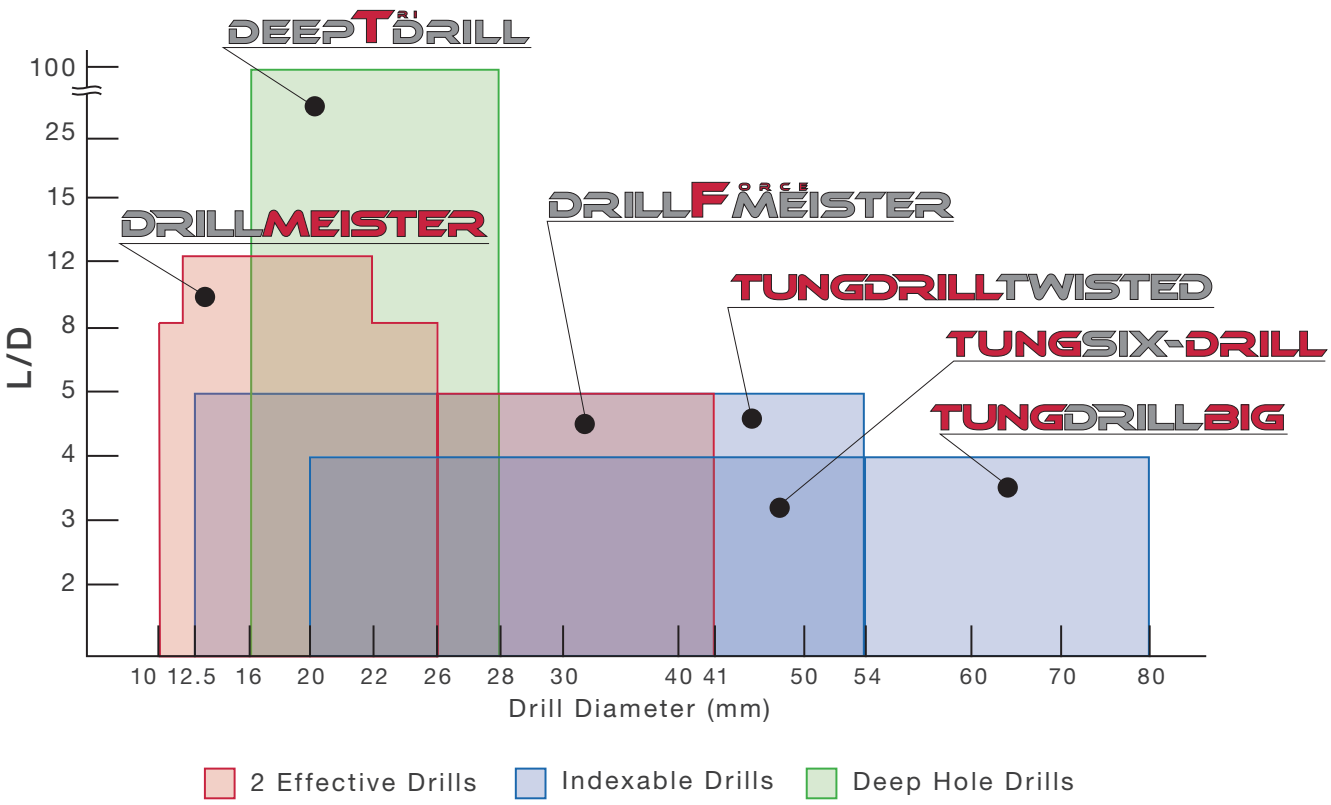
 Indexable Drill E070

 Deep Hole Drill E102

# Basic Selection of Drilling Tools

Application ranges of drilling tools

## Indexable & Head-Changeable Drills




## Hole diameter tolerance*

### TUNGSIX-DRILL

| L/D | Tool diameter | Hole diameter tolerance* |
|---|---|---|
| 2 | ø20 - ø27 | + 0.25 / 0 |
| | ø28 - ø54 | + 0.3 / 0 |
| 3 | ø20 - ø27 | + 0.25 / 0 |
| | ø28 - ø54 | + 0.3 / 0 |
| 4 | ø20 - ø27 | + 0.3 / 0 |
| | ø28 - ø54 | + 0.35 / 0 |

### TUNGDRILL TWISTED

| L/D | Tool diameter | Hole diameter tolerance* |
|---|---|---|
| 2 | ø12.5 - ø17 | + 0.25 / 0 |
| | ø17.5 - ø54 | + 0.3 / 0 |
| 3 | ø12.5 - ø17 | + 0.25 / 0 |
| | ø17.5 - ø54 | + 0.3 / 0 |
| 4 | ø12.5 - ø17 | + 0.4 / 0 |
| | ø17.5 - ø54 | + 0.45 / 0 |
| 5 | ø12.5 - ø17 | + 0.4 / 0 |
| | ø17.5 - ø54 | + 0.45 / 0 |

### DRILLMEISTER

| L/D | Tool diameter | Hole diameter tolerance* |
|---|---|---|
| TID 1.5 | ø10 - ø25.9 | + 0.05 / 0 |
| TID 3 | ø10 - ø25.9 | + 0.05 / 0 |
| TID 5 | ø10 - ø17.9 | + 0.06 / 0 |
| | ø18 - ø25.9 | + 0.065 / 0 |
| TID 8 | ø10 - ø17.9 | + 0.07 / 0 |
| | ø18 - ø25.9 | + 0.085 / 0 |
| TID 12 | ø12 - ø17.9 | + 0.08 / 0 |
| | ø18 - ø25.9 | + 0.095 / 0 |
| TIDC 3 | ø10 - ø19.9 | + 0.05 / 0 |
| TIDC 5 | ø10 - ø19.9 | + 0.05 / 0 |

### DRILL FORCE MEISTER

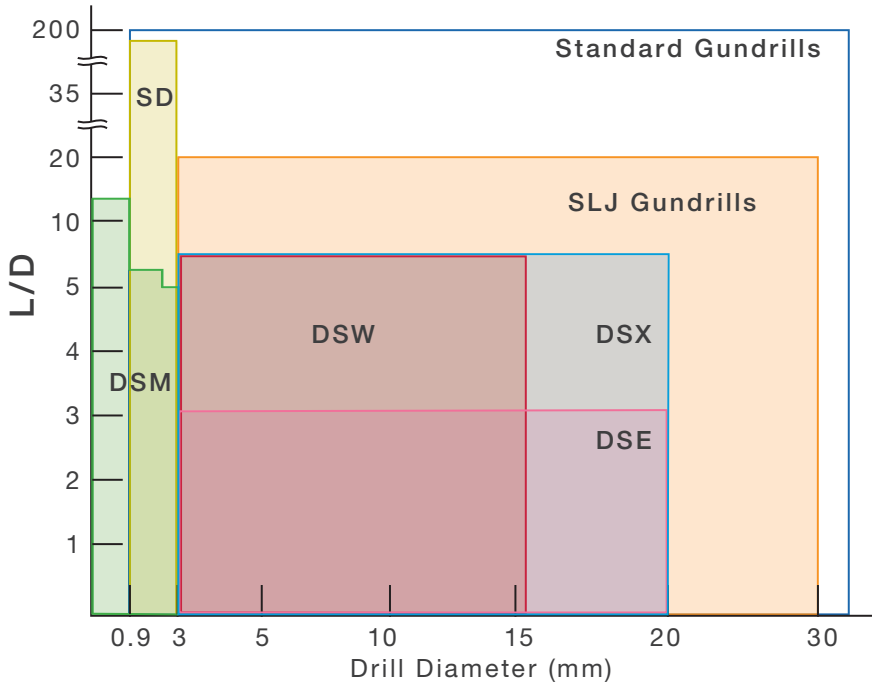
| L/D | Tool diameter | Hole diameter tolerance* |
|---|---|---|
| 3 | ø26 - ø29.9 | + 0.05 / 0 |
| | ø30 - ø41 | + 0.06 / 0 |
| 5 | ø26 - ø29.9 | + 0.08 / 0 |
| | ø30 - ø41 | + 0.09 / 0 |

### DEEP T-DRILL

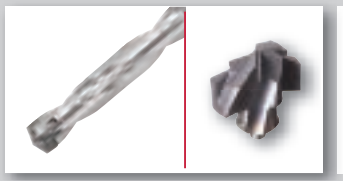
| L/D | Tool diameter | Hole diameter tolerance* |
|---|---|---|
| 10 | ø16 - ø28 | + 0.05 / - 0.1 |
| 15 | ø16 - ø28 | + 0.05 / - 0.1 |
| 25 | ø16 - ø28 | + 0.05 / - 0.1 |

* Just for reference

## Solid Drills, Brazed Carbide Drills



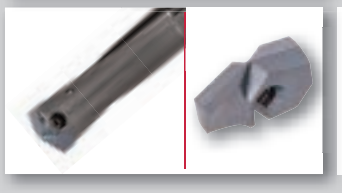
## Head-Changeable Drill



**DRILLMEISTER** E006

Drills with head-changeable system

ø10 mm - ø25.9 mm / L/D = 1.5, 3, 5, 8, 12 ※ L/D =12 : ø12 ~ ø22.9



**DRILLFORCE MEISTER** E020

Drills featuring indexable inserts with 2-effective cutting edges for large diameter drilling

ø26 mm - ø41 mm / L/D = 3, 5

## Solid Drill



**SOLIDDRILL** E025

Solid carbide drills for excellent performance

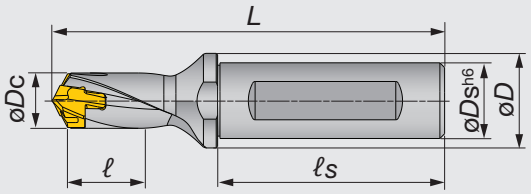


DrillForce-Meister

# TID L/D=1.5

Indexable head drill






| Designation | øDc | øDs | øD | ℓ | ℓs | L | Pocket size | Head |
|---|---|---|---|---|---|---|---|---|
| TID100F16-1.5 | 10 - 10.9 | 16 | 20 | 15 | 48 | 79.2 | 10 | DMP100 - DMP109 |
| TID110F16-1.5 | 11 - 11.9 | 16 | 20 | 17 | 48 | 81.1 | 11 | DMP110 - DMP119 |
| TID120F16-1.5 | 12 - 12.9 | 16 | 20 | 18 | 48 | 83 | 12 | DMP120 - DMP129 |
| TID130F16-1.5 | 13 - 13.9 | 16 | 20 | 20 | 48 | 85.1 | 13 | DMP130 - DMP139 |
| TID140F16-1.5 | 14 - 14.9 | 16 | 20 | 21 | 48 | 89.1 | 14 | DMP140 - DMP149 |
| TID150F20-1.5 | 15 - 15.9 | 20 | 25 | 23 | 50 | 96.2 | 15 | DMP150 - DMP159 |
| TID160F20-1.5 | 16 - 16.9 | 20 | 25 | 24 | 50 | 99.3 | 16 | DMP160 - DMP169 |
| TID170F20-1.5 | 17 - 17.9 | 20 | 25 | 26 | 50 | 102.4 | 17 | DMP170 - DMP179 |
| TID180F25-1.5 | 18 - 18.9 | 25 | 32 | 27 | 56 | 111.5 | 18 | DMP180 - DMP189 |
| TID190F25-1.5 | 19 - 19.9 | 25 | 32 | 29 | 56 | 114.5 | 19 | DMP190 - DMP199 |
| TID200F25-1.5 | 20 - 20.9 | 25 | 32 | 30 | 56 | 117.6 | 20 | DMP200 - DMP209 |
| TID210F25-1.5 | 21 - 21.9 | 25 | 32 | 32 | 56 | 120.7 | 21 | DMP210 - DMP219 |
| TID220F25-1.5 | 22 - 22.9 | 25 | 32 | 33 | 56 | 123.8 | 22 | DMP220 - DMP229 |
| TID230F32-1.5 | 23 - 23.9 | 32 | 42 | 35 | 60 | 130.8 | 23 | DMP230 - DMP239 |
| TID240F32-1.5 | 24 - 24.9 | 32 | 42 | 36 | 60 | 133.9 | 24 | DMP240 - DMP249 |
| TID250F32-1.5 | 25 - 25.9 | 32 | 42 | 38 | 60 | 137 | 25 | DMP250 - DMP259 |

| Tool diameter | Hole diameter tolerance* |
|---|---|
| ø10 - ø25.9 | +0.05 / 0 |

*Just for reference

## SPARE PARTS



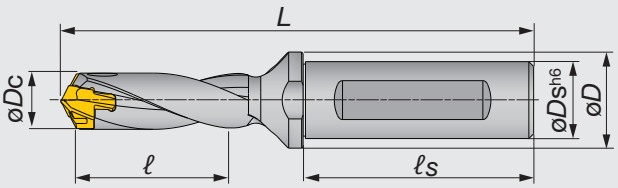
| Designation | Clamping key |
|---|---|
| TID100-190 | K-TID10-19.99 |
| TID200-250 | K-TID20-26.99 |

# DRILLMEISTER

## TID L/D=3

Indexable head drill






| Designation | øDc | øDs | øD | ℓ | ℓs | L | Pocket size | Head |
|---|---|---|---|---|---|---|---|---|
| TID100F16-3 | 10 - 10.4 | 16 | 20 | 30 | 48 | 94.2 | 10 | DMP100 - DMP104 |
| TID105F16-3 | 10.5 - 10.9 | 16 | 20 | 32 | 48 | 95.7 | 10 | DMP105 - DMP109 |
| TID110F16-3 | 11 - 11.4 | 16 | 20 | 33 | 48 | 97.6 | 11 | DMP110 - DMP114 |
| TID115F16-3 | 11.5 - 11.9 | 16 | 20 | 35 | 48 | 99.1 | 11 | DMP115 - DMP119 |
| TID120F16-3 | 12 - 12.4 | 16 | 20 | 36 | 48 | 101 | 12 | DMP120 - DMP124 |
| TID125F16-3 | 12.5 - 12.9 | 16 | 20 | 37 | 48 | 102.5 | 12 | DMP125 - DMP129 |
| TID130F16-3 | 13 - 13.4 | 16 | 20 | 39 | 48 | 104.6 | 13 | DMP130 - DMP134 |
| TID135F16-3 | 13.5 - 13.9 | 16 | 20 | 41 | 48 | 106.1 | 13 | DMP135 - DMP139 |
| TID140F16-3 | 14 - 14.4 | 16 | 20 | 42 | 48 | 110.1 | 14 | DMP140 - DMP144 |
| TID145F16-3 | 14.5 - 14.9 | 16 | 20 | 44 | 48 | 111.6 | 14 | DMP145 - DMP149 |
| TID150F20-3 | 15 - 15.9 | 20 | 25 | 45 | 50 | 118.7 | 15 | DMP150 - DMP159 |
| TID160F20-3 | 16 - 16.9 | 20 | 25 | 48 | 50 | 123.3 | 16 | DMP160 - DMP169 |
| TID170F20-3 | 17 - 17.9 | 20 | 25 | 51 | 50 | 127.9 | 17 | DMP170 - DMP179 |
| TID180F25-3 | 18 - 18.9 | 25 | 32 | 54 | 56 | 138.5 | 18 | DMP180 - DMP189 |
| TID190F25-3 | 19 - 19.9 | 25 | 32 | 57 | 56 | 143 | 19 | DMP190 - DMP199 |
| TID200F25-3 | 20 - 20.9 | 25 | 32 | 60 | 56 | 147.6 | 20 | DMP200 - DMP209 |
| TID210F25-3 | 21 - 21.9 | 25 | 32 | 63 | 56 | 152.2 | 21 | DMP210 - DMP219 |
| TID220F25-3 | 22 - 22.9 | 25 | 32 | 66 | 56 | 156.8 | 22 | DMP220 - DMP229 |
| TID230F32-3 | 23 - 23.9 | 32 | 42 | 69 | 60 | 165.3 | 23 | DMP230 - DMP239 |
| TID240F32-3 | 24 - 24.9 | 32 | 42 | 72 | 60 | 169.9 | 24 | DMP240 - DMP249 |
| TID250F32-3 | 25 - 25.9 | 32 | 42 | 75 | 60 | 174.5 | 25 | DMP250 - DMP259 |

| Tool diameter | Hole diameter tolerance* |
|---|---|
| ø10 - ø25.9 | +0.05 / 0 |

*Just for reference

### SPARE PARTS

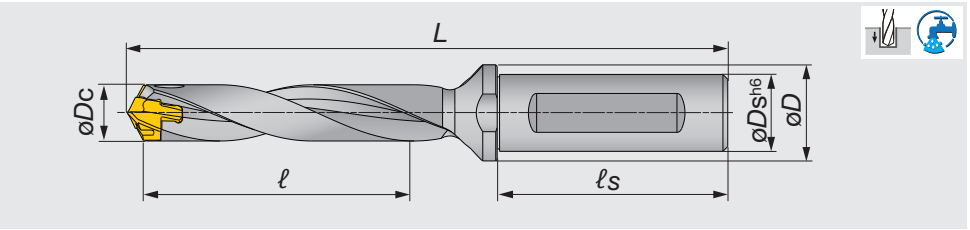


| Designation | Clamping key |
|---|---|
| TID100-190 | K-TID10-19.99 |
| TID200-250 | K-TID20-26.99 |

# TID L/D=5

Indexable head drill






| Designation | øDc | øDs | øD | ℓ | ℓs | L | Pocket size | Head |
|---|---|---|---|---|---|---|---|---|
| TID100F16-5 | 10 - 10.4 | 16 | 20 | 50 | 48 | 114.2 | 10 | DMP100 - DMP104 |
| TID105F16-5 | 10.5 - 10.9 | 16 | 20 | 53 | 48 | 116.7 | 10 | DMP105 - DMP109 |
| TID110F16-5 | 11 - 11.4 | 16 | 20 | 55 | 48 | 119.6 | 11 | DMP110 - DMP114 |
| TID115F16-5 | 11.5 - 11.9 | 16 | 20 | 58 | 48 | 122.1 | 11 | DMP115 - DMP119 |
| TID120F16-5 | 12 - 12.4 | 16 | 20 | 60 | 48 | 125 | 12 | DMP120 - DMP124 |
| TID125F16-5 | 12.5 - 12.9 | 16 | 20 | 62 | 48 | 127.5 | 12 | DMP125 - DMP129 |
| TID130F16-5 | 13 - 13.4 | 16 | 20 | 65 | 48 | 130.6 | 13 | DMP130 - DMP134 |
| TID135F16-5 | 13.5 - 13.9 | 16 | 20 | 68 | 48 | 133.1 | 13 | DMP135 - DMP139 |
| TID140F16-5 | 14 - 14.4 | 16 | 20 | 70 | 48 | 138.2 | 14 | DMP140 - DMP144 |
| TID145F16-5 | 14.5 - 14.9 | 16 | 20 | 73 | 48 | 140.7 | 14 | DMP145 - DMP149 |
| TID150F20-5 | 15 - 15.9 | 20 | 25 | 75 | 50 | 148.7 | 15 | DMP150 - DMP159 |
| TID160F20-5 | 16 - 16.9 | 20 | 25 | 80 | 50 | 155.3 | 16 | DMP160 - DMP169 |
| TID170F20-5 | 17 - 17.9 | 20 | 25 | 85 | 50 | 161.9 | 17 | DMP170 - DMP179 |
| TID180F25-5 | 18 - 18.9 | 25 | 32 | 90 | 56 | 174.5 | 18 | DMP180 - DMP189 |
| TID190F25-5 | 19 - 19.9 | 25 | 32 | 95 | 56 | 181 | 19 | DMP190 - DMP199 |
| TID200F25-5 | 20 - 20.9 | 25 | 32 | 100 | 56 | 187.6 | 20 | DMP200 - DMP209 |
| TID210F25-5 | 21 - 21.9 | 25 | 32 | 105 | 56 | 194.2 | 21 | DMP210 - DMP219 |
| TID220F25-5 | 22 - 22.9 | 25 | 32 | 110 | 56 | 200.8 | 22 | DMP220 - DMP229 |
| TID230F32-5 | 23 - 23.9 | 32 | 42 | 115 | 60 | 211.3 | 23 | DMP230 - DMP239 |
| TID240F32-5 | 24 - 24.9 | 32 | 42 | 120 | 60 | 217.9 | 24 | DMP240 - DMP249 |
| TID250F32-5 | 25 - 25.9 | 32 | 42 | 125 | 60 | 224.5 | 25 | DMP250 - DMP259 |

| Tool diameter | Hole diameter tolerance* |
|---|---|
| ø10 - ø17.9 | +0.06 / 0 |
| ø18 - ø25.9 | +0.065 / 0 |

*Just for reference

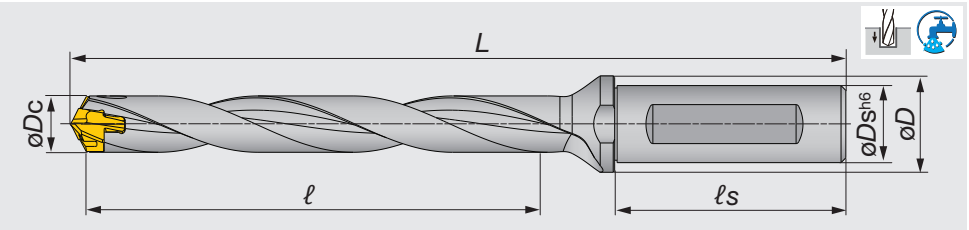
## SPARE PARTS

| Designation | Clamping key |
|---|---|
| TID100-190 | K-TID10-19.99 |
| TID200-250 | K-TID20-26.99 |

# TID L/D=8

## Indexable head drill






| Designation | øDc | øDs | øD | ℓ | ℓs | L | Pocket size | Head |
|---|---|---|---|---|---|---|---|---|
| TID100F16-8 | 10 - 10.4 | 16 | 20 | 80 | 48 | 144.2 | 10 | DMP100 - DMP104 |
| TID105F16-8 | 10.5 - 10.9 | 16 | 20 | 84 | 48 | 148.2 | 10 | DMP105 - DMP109 |
| TID110F16-8 | 11 - 11.4 | 16 | 20 | 88 | 48 | 152.6 | 11 | DMP110 - DMP114 |
| TID115F16-8 | 11.5 - 11.9 | 16 | 20 | 92 | 48 | 156.6 | 11 | DMP115 - DMP119 |
| TID120F16-8 | 12 - 12.4 | 16 | 20 | 96 | 48 | 161 | 12 | DMP120 - DMP124 |
| TID125F16-8 | 12.5 - 12.9 | 16 | 20 | 100 | 48 | 165 | 12 | DMP125 - DMP129 |
| TID130F16-8 | 13 - 13.4 | 16 | 20 | 104 | 48 | 169.6 | 13 | DMP130 - DMP134 |
| TID135F16-8 | 13.5 - 13.9 | 16 | 20 | 108 | 48 | 173.6 | 13 | DMP135 - DMP139 |
| TID140F16-8 | 14 - 14.4 | 16 | 20 | 112 | 48 | 180.1 | 14 | DMP140 - DMP144 |
| TID145F16-8 | 14.5 - 14.9 | 16 | 20 | 116 | 48 | 184.2 | 14 | DMP145 - DMP149 |
| TID150F20-8 | 15 - 15.9 | 20 | 25 | 120 | 50 | 193.7 | 15 | DMP150 - DMP159 |
| TID160F20-8 | 16 - 16.9 | 20 | 25 | 128 | 50 | 203.3 | 16 | DMP160 - DMP169 |
| TID170F20-8 | 17 - 17.9 | 20 | 25 | 136 | 50 | 212.9 | 17 | DMP170 - DMP179 |
| TID180F25-8 | 18 - 18.9 | 25 | 32 | 144 | 56 | 228.5 | 18 | DMP180 - DMP189 |
| TID190F25-8 | 19 - 19.9 | 25 | 32 | 152 | 56 | 238 | 19 | DMP190 - DMP199 |
| TID200F25-8 | 20 - 20.9 | 25 | 32 | 160 | 56 | 247.6 | 20 | DMP200 - DMP209 |
| TID210F25-8 | 21 - 21.9 | 25 | 32 | 168 | 56 | 257.2 | 21 | DMP210 - DMP219 |
| TID220F25-8 | 22 - 22.9 | 25 | 32 | 176 | 56 | 266.8 | 22 | DMP220 - DMP229 |
| TID230F32-8 | 23 - 23.9 | 32 | 42 | 184 | 60 | 280.3 | 23 | DMP230 - DMP239 |
| TID240F32-8 | 24 - 24.9 | 32 | 42 | 192 | 60 | 289.9 | 24 | DMP240 - DMP249 |
| TID250F32-8 | 25 - 25.9 | 32 | 42 | 200 | 60 | 299.5 | 25 | DMP250 - DMP259 |

| Tool diameter | Hole diameter tolerance* |
|---|---|
| ø10 - ø17.9 | +0.07 / 0 |
| ø18 - ø25.9 | +0.085 / 0 |

*Just for reference

### SPARE PARTS

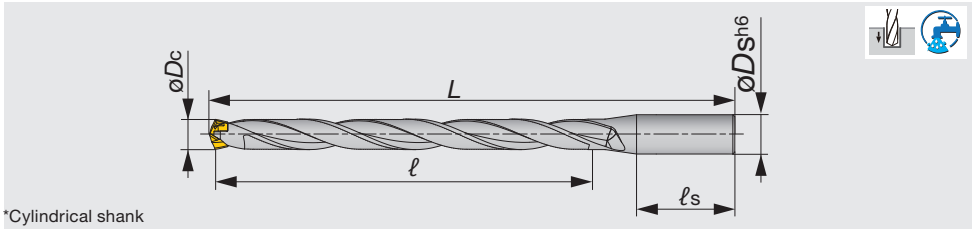


| Designation | Clamping key |
|---|---|
| TID100-190 | K-TID10-19.99 |
| TID200-250 | K-TID20-26.99 |

# TID L/D=12

## Indexable head drill






*Cylindrical shank

| Designation | øDc | øDs | ℓ | ℓs | L | Pocket size | Head |
|---|---|---|---|---|---|---|---|
| TID120R16-12 | 12 - 12.4 | 16 | 144 | 48 | 209 | 12 | DMP120 - 124 |
| TID125R16-12 | 12.5 - 12.9 | 16 | 150 | 48 | 215 | 12 | DMP125 - 129 |
| TID130R16-12 | 13 - 13.4 | 16 | 156 | 48 | 221.6 | 13 | DMP130 - 134 |
| TID135R16-12 | 13.5 - 13.9 | 16 | 162 | 48 | 227.6 | 13 | DMP135 - 139 |
| TID140R16-12 | 14 - 14.4 | 16 | 168 | 48 | 236.2 | 14 | DMP140 - 144 |
| TID145R16-12 | 14.5 - 14.9 | 16 | 174 | 48 | 242.2 | 14 | DMP145 - 149 |
| TID150R20-12 | 15 - 15.9 | 20 | 180 | 50 | 253.7 | 15 | DMP150 - 159 |
| TID160R20-12 | 16 - 16.9 | 20 | 192 | 50 | 267.3 | 16 | DMP160 - 169 |
| TID170R20-12 | 17 - 17.9 | 20 | 204 | 50 | 280.9 | 17 | DMP170 - 179 |
| TID180R25-12 | 18 - 18.9 | 25 | 216 | 56 | 300.5 | 18 | DMP180 - 189 |
| TID190R25-12 | 19 - 19.9 | 25 | 228 | 56 | 314 | 19 | DMP190 - 199 |
| TID200R25-12 | 20 - 20.9 | 25 | 240 | 56 | 327.6 | 20 | DMP200 - 209 |
| TID210R25-12 | 21 - 21.9 | 25 | 252 | 56 | 341.2 | 21 | DMP210 - 219 |
| TID220R25-12 | 22 - 22.9 | 25 | 264 | 56 | 354.8 | 22 | DMP220 - 229 |

| Tool diameter | Hole diameter tolerance* |
|---|---|
| ø12 - ø17.9 | +0.08 / 0 |
| ø18 - ø25.9 | +0.095 / 0 |

*Just for reference

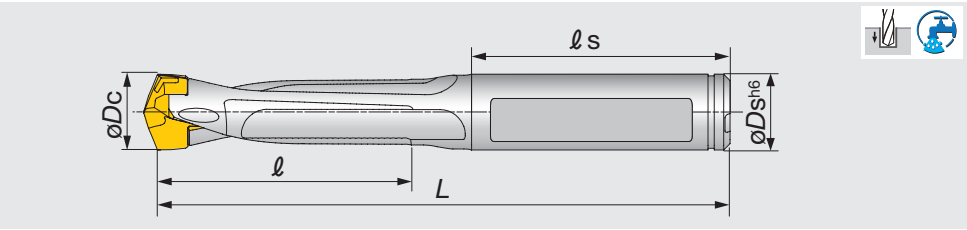
### SPARE PARTS

| Designation | Clamping key |
|---|---|
| TID100-190 | K-TID10-19.99 |
| TID200-220 | K-TID20-26.99 |

# TIDC L/D=3

## Indexable head drill






| Designation | øDc | øDs | ℓ | ℓs | L | Pocket size | Head |
|---|---|---|---|---|---|---|---|
| TIDC100C10-3 | 10 - 10.4 | 10 | 30 | 43 | 85 | 10 | DMP100 - DMP104 |
| TIDC105C11-3 | 10.5 - 10.9 | 11 | 31.5 | 43 | 87.1 | 10 | DMP105 - DMP109 |
| TIDC110C11-3 | 11 - 11.4 | 11 | 33 | 43 | 89.2 | 11 | DMP110 - DMP114 |
| TIDC115C12-3 | 11.5 - 11.9 | 12 | 34.5 | 43 | 91.3 | 11 | DMP115 - DMP119 |
| TIDC120C12-3 | 12 - 12.4 | 12 | 36 | 43 | 95 | 12 | DMP120 - DMP124 |
| TIDC125C13-3 | 12.5 - 12.9 | 13 | 37.5 | 43 | 95.5 | 12 | DMP125 - DMP129 |
| TIDC130C13-3 | 13 - 13.4 | 13 | 39 | 45 | 99.6 | 13 | DMP130 - DMP134 |
| TIDC135C14-3 | 13.5 - 13.9 | 14 | 40.5 | 45 | 101.7 | 13 | DMP135 - DMP139 |
| TIDC140C14-3 | 14 - 14.4 | 14 | 42 | 45 | 103.8 | 14 | DMP140 - DMP144 |
| TIDC145C15-3 | 14.5 - 14.9 | 15 | 43.5 | 45 | 105.9 | 14 | DMP145 - DMP149 |
| TIDC150C15-3 | 15 - 15.9 | 15 | 45 | 45 | 108 | 15 | DMP150 - DMP159 |
| TIDC160C16-3 | 16 - 16.9 | 16 | 48 | 48 | 117.7 | 16 | DMP160 - DMP169 |
| TIDC170C17-3 | 17 - 17.9 | 17 | 51 | 48 | 119.4 | 17 | DMP170 - DMP179 |
| TIDC180C18-3 | 18 - 18.9 | 18 | 54 | 48 | 123.3 | 18 | DMP180 - DMP189 |
| TIDC190C19-3 | 19 - 19.9 | 19 | 57 | 54 | 132.2 | 19 | DMP190 - DMP199 |

| Tool diameter | Hole diameter tolerance* |
|---|---|
| ø10 - ø19.9 | +0.05 / 0 |

*Just for reference

### SPARE PARTS

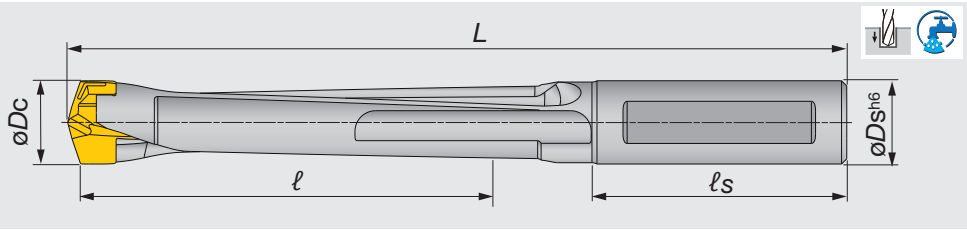


| Designation | Clamping key |
|---|---|
| TIDC100-190 | K-TID10-19.99 |

# TIDC L/D=5

## Indexable head drill






| Designation | øDc | øDs | ℓ | ℓs | L | Pocket size | Head |
|---|---|---|---|---|---|---|---|
| TIDC100C10-5 | 10 - 10.4 | 10 | 50 | 43 | 105 | 10 | DMP100 - DMP104 |
| TIDC105C11-5 | 10.5 - 10.9 | 11 | 52.5 | 43 | 108.1 | 10 | DMP105 - DMP109 |
| TIDC110C11-5 | 11 - 11.4 | 11 | 55 | 43 | 111.2 | 11 | DMP110 - DMP114 |
| TIDC115C12-5 | 11.5 - 11.9 | 12 | 57.5 | 43 | 114.3 | 11 | DMP115 - DMP119 |
| TIDC120C12-5 | 12 - 12.4 | 12 | 60 | 43 | 119 | 12 | DMP120 - DMP124 |
| TIDC125C13-5 | 12.5 - 12.9 | 13 | 62.5 | 43 | 120.5 | 12 | DMP125 - DMP129 |
| TIDC130C13-5 | 13 - 13.4 | 13 | 65 | 45 | 125.6 | 13 | DMP130 - DMP134 |
| TIDC135C14-5 | 13.5 - 13.9 | 14 | 67.5 | 45 | 128.7 | 13 | DMP135 - DMP139 |
| TIDC140C14-5 | 14 - 14.4 | 14 | 70 | 45 | 131.8 | 14 | DMP140 - DMP144 |
| TIDC145C15-5 | 14.5 - 14.9 | 15 | 72.5 | 45 | 134.9 | 14 | DMP145 - DMP149 |
| TIDC150C15-5 | 15 - 15.9 | 15 | 75 | 45 | 138 | 15 | DMP150 - DMP159 |
| TIDC160C16-5 | 16 - 16.9 | 16 | 80 | 48 | 149.7 | 16 | DMP160 - DMP169 |
| TIDC170C17-5 | 17 - 17.9 | 17 | 85 | 48 | 153.4 | 17 | DMP170 - DMP179 |
| TIDC180C18-5 | 18 - 18.9 | 18 | 90 | 48 | 159.6 | 18 | DMP180 - DMP189 |
| TIDC190C19-5 | 19 - 19.9 | 19 | 95 | 54 | 170.2 | 19 | DMP190 - DMP199 |

| Tool diameter | Hole diameter tolerance* |
|---|---|
| ø10 - ø19.9 | +0.05 / 0 |

*Just for reference

### SPARE PARTS

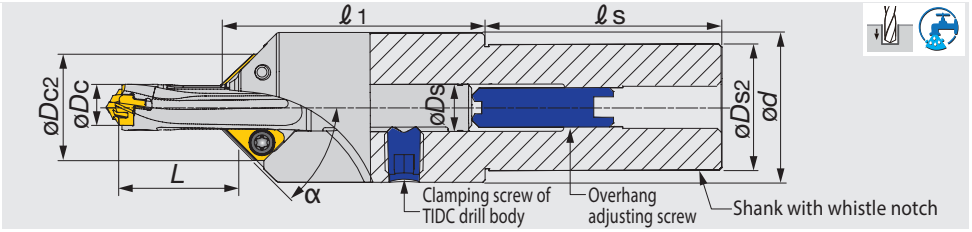


| Designation | Clamping key |
|---|---|
| TIDC100-190 | K-TID10-19.99 |

# TIDCF

## Chamfering adapter






| Designation | øDc | øDs2 | ød | øDc2 | ℓ1 | ℓs | L* L/D = 3 | L* L/D = 5 | Drill body | øDs |
|---|---|---|---|---|---|---|---|---|---|---|
| TIDCF100-W32 | 10 - 10.4 | 32 | 38 | 24.9 | 67.3 | 60 | 14.5 - 31.8 | 31.7 - 51.8 | TIDC100C10-... | 10 |
| TIDCF110-W32 | 10.5 - 10.9 | 32 | 38 | 25.9 | 67.3 | 60 | 15.7 - 33.3 | 31.2 - 54.2 | TIDC105C11-... | 11 |
| TIDCF110-W32 | 11 - 11.4 | 32 | 38 | 25.9 | 67.3 | 60 | 16.2 - 35.3 | 34.1 - 57.3 | TIDC110C11-... | 11 |
| TIDCF120-W32 | 11.5 - 11.9 | 32 | 38 | 26.9 | 67.3 | 60 | 15.1 - 36.7 | 33.8 - 59.4 | TIDC115C12-... | 12 |
| TIDCF120-W32 | 12 - 12.4 | 32 | 38 | 26.9 | 67.3 | 60 | 16.5 - 37.7 | 36.6 - 61.6 | TIDC120C12-... | 12 |
| TIDCF130-W32 | 12.5 - 12.9 | 32 | 38 | 27.9 | 67.3 | 60 | 16.1 - 39.6 | 39.7 - 64.8 | TIDC125C13-... | 13 |
| TIDCF130-W32 | 13 - 13.4 | 32 | 38 | 27.9 | 67.3 | 60 | 17.5 - 41.5 | 42.7 - 68 | TIDC130C13-... | 13 |
| TIDCF140-W32 | 13.5 - 13.9 | 32 | 38 | 28.4 | 67.3 | 60 | 17.7 - 42.9 | 41.4 - 70.3 | TIDC135C14-... | 14 |
| TIDCF140-W32 | 14 - 14.4 | 32 | 38 | 28.4 | 67.3 | 60 | 18.1 - 45 | 44.8 - 73.1 | TIDC140C14-... | 14 |
| TIDCF150-W32 | 14.5 - 14.9 | 32 | 38 | 29.4 | 67.3 | 60 | 19.2 - 44.6 | 44 - 73.9 | TIDC145C15-... | 15 |
| TIDCF150-W32 | 15 - 15.9 | 32 | 38 | 29.4 | 67.3 | 60 | 19.7 - 47.4 | 47.6 - 80.7 | TIDC150C15-... | 15 |
| TIDCF160-W32 | 16 - 16.9 | 32 | 38 | 30.4 | 67.3 | 60 | 19.5 - 55.3 | 57 - 87.5 | TIDC160C16-... | 16 |
| TIDCF170-W32 | 17 - 17.9 | 32 | 38 | 31.4 | 67.3 | 60 | 21.4 - 54.9 | 55.9 - 88.5 | TIDC170C17-... | 17 |
| TIDCF180-W32 | 18 - 18.9 | 32 | 38 | 32.4 | 67.3 | 60 | 24.2 - 65.2 | 60 - 93 | TIDC180C18-... | 18 |
| TIDCF190-W32 | 19 - 19.9 | 32 | 38 | 33.4 | 75 | 60 | 28.5 - 62.3 | 67 - 100 | TIDC190C19-... | 19 |

• *L** is the dimension when using 45° chamfering insert.

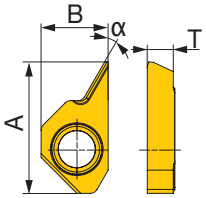
### SPARE PARTS

| Designation | Insert screw | Grip | Overhang adjusting screw | Clamping screw of TIDC drill body | Torx bit | Wrench |
|---|---|---|---|---|---|---|
| TIDCF | SR14-544/S | SW6-SD | SRM10X10DIN916 | SRM10X1.5S | BT15S | HW5.0 |

## CHAMFERING INSERT

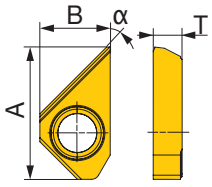
### XHGT-30A





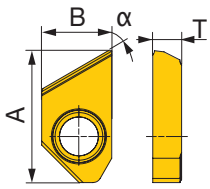

### XHGR-45A






### XHGR-60A






| Designation | GH730 | A | B | T | Chamfering angle α° | Maximum width of chamfer ** |
|---|---|---|---|---|---|---|
| XHGT090300-30A | ● | 16 | 8.5 | 3.3 | 30 | 1.5 |
| XHGR090300-45A | ● | 16 | 8.5 | 3.3 | 45 | 6 |
| XHGR090300-60A | ● | 16 | 8.5 | 3.3 | 60 | 3.5 |

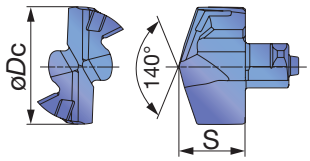
**Please reduce the feed rate to half when chamfering over 60% of maximum width of chamfer

● : Line-up
Package quantity = 2 pcs.

# DRILL HEAD

## DMP






| Designation | øDc | AH725 | S | Pocket size | Body |
|---|---|---|---|---|---|
| DMP100 | 10 | ● | 6.05 | 10 | TID*100... |
| DMP101 | 10.1 | ● | 6.05 | 10 | TID*100... |
| DMP102 | 10.2 | ● | 6.05 | 10 | TID*100... |
| DMP103 | 10.3 | ● | 6.05 | 10 | TID*100... |
| DMP104 | 10.4 | ● | 6.05 | 10 | TID*100... |
| DMP105 | 10.5 | ● | 6.05 | 10 | TID*105... |
| DMP106 | 10.6 | ● | 6.05 | 10 | TID*105... |
| DMP107 | 10.7 | ● | 6.05 | 10 | TID*105... |
| DMP108 | 10.8 | ● | 6.05 | 10 | TID*105... |
| DMP109 | 10.9 | ● | 6.05 | 10 | TID*105... |
| DMP110 | 11 | ● | 6.45 | 11 | TID*110... |
| DMP111 | 11.1 | ● | 6.45 | 11 | TID*110... |
| DMP112 | 11.2 | ● | 6.45 | 11 | TID*110... |
| DMP113 | 11.3 | ● | 6.45 | 11 | TID*110... |
| DMP114 | 11.4 | ● | 6.45 | 11 | TID*110... |
| DMP115 | 11.5 | ● | 6.45 | 11 | TID*115... |
| DMP116 | 11.6 | ● | 6.45 | 11 | TID*115... |
| DMP117 | 11.7 | ● | 6.45 | 11 | TID*115... |
| DMP118 | 11.8 | ● | 6.45 | 11 | TID*115... |
| DMP119 | 11.9 | ● | 6.45 | 11 | TID*115... |
| DMP120 | 12 | ● | 6.8 | 12 | TID*120... |
| DMP121 | 12.1 | ● | 6.8 | 12 | TID*120... |
| DMP122 | 12.2 | ● | 6.8 | 12 | TID*120... |
| DMP123 | 12.3 | ● | 6.8 | 12 | TID*120... |
| DMP124 | 12.4 | ● | 6.8 | 12 | TID*120... |
| DMP125 | 12.5 | ● | 6.8 | 12 | TID*125... |
| DMP126 | 12.6 | ● | 6.8 | 12 | TID*125... |
| DMP127 | 12.7 | ● | 6.8 | 12 | TID*125... |
| DMP128 | 12.8 | ● | 6.8 | 12 | TID*125... |
| DMP129 | 12.9 | ● | 6.8 | 12 | TID*125... |
| DMP130 | 13 | ● | 7.4 | 13 | TID*130... |
| DMP131 | 13.1 | ● | 7.4 | 13 | TID*130... |
| DMP132 | 13.2 | ● | 7.4 | 13 | TID*130... |
| DMP133 | 13.3 | ● | 7.4 | 13 | TID*130... |
| DMP134 | 13.4 | ● | 7.4 | 13 | TID*130... |
| DMP135 | 13.5 | ● | 7.4 | 13 | TID*135... |
| DMP136 | 13.6 | ● | 7.4 | 13 | TID*135... |
| DMP137 | 13.7 | ● | 7.4 | 13 | TID*135... |
| DMP138 | 13.8 | ● | 7.4 | 13 | TID*135... |
| DMP139 | 13.9 | ● | 7.4 | 13 | TID*135... |
| DMP140 | 14 | ● | 7.95 | 14 | TID*140... |
| DMP141 | 14.1 | ● | 7.95 | 14 | TID*140... |
| DMP142 | 14.2 | ● | 7.95 | 14 | TID*140... |
| DMP143 | 14.3 | ● | 7.95 | 14 | TID*140... |
| DMP144 | 14.4 | ● | 7.95 | 14 | TID*140... |
| DMP145 | 14.5 | ● | 7.95 | 14 | TID*145... |
| DMP146 | 14.6 | ● | 7.95 | 14 | TID*145... |
| DMP147 | 14.7 | ● | 7.95 | 14 | TID*145... |
| DMP148 | 14.8 | ● | 7.95 | 14 | TID*145... |
| DMP149 | 14.9 | ● | 7.95 | 14 | TID*145... |
| DMP150 | 15 | ● | 8.53 | 15 | TID*150... |
| DMP151 | 15.1 | ● | 8.53 | 15 | TID*150... |
| DMP152 | 15.2 | ● | 8.53 | 15 | TID*150... |
| DMP153 | 15.3 | ● | 8.53 | 15 | TID*150... |
| DMP154 | 15.4 | ● | 8.53 | 15 | TID*150... |
| DMP155 | 15.5 | ● | 8.53 | 15 | TID*150... |
| DMP156 | 15.6 | ● | 8.53 | 15 | TID*150... |
| DMP157 | 15.7 | ● | 8.53 | 15 | TID*150... |
| DMP158 | 15.8 | ● | 8.53 | 15 | TID*150... |
| DMP159 | 15.9 | ● | 8.53 | 15 | TID*150... |
| DMP160 | 16 | ● | 9.1 | 16 | TID*160... |
| DMP161 | 16.1 | ● | 9.1 | 16 | TID*160... |
| DMP162 | 16.2 | ● | 9.1 | 16 | TID*160... |
| DMP163 | 16.3 | ● | 9.1 | 16 | TID*160... |
| DMP164 | 16.4 | ● | 9.1 | 16 | TID*160... |
| DMP165 | 16.5 | ● | 9.1 | 16 | TID*160... |
| DMP166 | 16.6 | ● | 9.1 | 16 | TID*160... |
| DMP167 | 16.7 | ● | 9.1 | 16 | TID*160... |
| DMP168 | 16.8 | ● | 9.1 | 16 | TID*160... |
| DMP169 | 16.9 | ● | 9.1 | 16 | TID*160... |
| DMP170 | 17 | ● | 9.7 | 17 | TID*170... |
| DMP171 | 17.1 | ● | 9.7 | 17 | TID*170... |
| DMP172 | 17.2 | ● | 9.7 | 17 | TID*170... |
| DMP173 | 17.3 | ● | 9.7 | 17 | TID*170... |
| DMP174 | 17.4 | ● | 9.7 | 17 | TID*170... |
| DMP175 | 17.5 | ● | 9.7 | 17 | TID*170... |
| DMP176 | 17.6 | ● | 9.7 | 17 | TID*170... |
| DMP177 | 17.7 | ● | 9.7 | 17 | TID*170... |
| DMP178 | 17.8 | ● | 9.7 | 17 | TID*170... |
| DMP179 | 17.9 | ● | 9.7 | 17 | TID*170... |
| DMP180 | 18 | ● | 10.3 | 18 | TID*180... |
| DMP181 | 18.1 | ● | 10.3 | 18 | TID*180... |
| DMP182 | 18.2 | ● | 10.3 | 18 | TID*180... |
| DMP183 | 18.3 | ● | 10.3 | 18 | TID*180... |
| DMP184 | 18.4 | ● | 10.3 | 18 | TID*180... |
| DMP185 | 18.5 | ● | 10.3 | 18 | TID*180... |
| DMP186 | 18.6 | ● | 10.3 | 18 | TID*180... |
| DMP187 | 18.7 | ● | 10.3 | 18 | TID*180... |
| DMP188 | 18.8 | ● | 10.3 | 18 | TID*180... |
| DMP189 | 18.9 | ● | 10.3 | 18 | TID*180... |
| DMP190 | 19 | ● | 10.8 | 19 | TID*190... |
| DMP191 | 19.1 | ● | 10.8 | 19 | TID*190... |
| DMP192 | 19.2 | ● | 10.8 | 19 | TID*190... |
| DMP193 | 19.3 | ● | 10.8 | 19 | TID*190... |
| DMP194 | 19.4 | ● | 10.8 | 19 | TID*190... |
| DMP195 | 19.5 | ● | 10.8 | 19 | TID*190... |
| DMP196 | 19.6 | ● | 10.8 | 19 | TID*190... |
| DMP197 | 19.7 | ● | 10.8 | 19 | TID*190... |
| DMP198 | 19.8 | ● | 10.8 | 19 | TID*190... |
| DMP199 | 19.9 | ● | 10.8 | 19 | TID*190... |
| DMP200 | 20 | ● | 11.4 | 20 | TID*200... |
| DMP201 | 20.1 | ● | 11.4 | 20 | TID*200... |
| DMP202 | 20.2 | ● | 11.4 | 20 | TID*200... |
| DMP203 | 20.3 | ● | 11.4 | 20 | TID*200... |
| DMP204 | 20.4 | ● | 11.4 | 20 | TID*200... |
| DMP205 | 20.5 | ● | 11.4 | 20 | TID*200... |
| DMP206 | 20.6 | ● | 11.4 | 20 | TID*200... |
| DMP207 | 20.7 | ● | 11.4 | 20 | TID*200... |

| Designation | øDc | AH725 | S | Pocket size | Body |
|---|---|---|---|---|---|
| DMP208 | 20.8 | ● | 11.4 | 20 | TID*200... |
| DMP209 | 20.9 | ● | 11.4 | 20 | TID*200... |
| DMP210 | 21 | ● | 11.98 | 21 | TID*210... |
| DMP211 | 21.1 | ● | 11.98 | 21 | TID*210... |
| DMP212 | 21.2 | ● | 11.98 | 21 | TID*210... |
| DMP213 | 21.3 | ● | 11.98 | 21 | TID*210... |
| DMP214 | 21.4 | ● | 11.98 | 21 | TID*210... |
| DMP215 | 21.5 | ● | 11.98 | 21 | TID*210... |
| DMP216 | 21.6 | ● | 11.98 | 21 | TID*210... |
| DMP217 | 21.7 | ● | 11.98 | 21 | TID*210... |
| DMP218 | 21.8 | ● | 11.98 | 21 | TID*210... |
| DMP219 | 21.9 | ● | 11.98 | 21 | TID*210... |
| DMP220 | 22 | ● | 12.56 | 22 | TID*220... |
| DMP221 | 22.1 | ● | 12.56 | 22 | TID*220... |
| DMP222 | 22.2 | ● | 12.56 | 22 | TID*220... |
| DMP223 | 22.3 | ● | 12.56 | 22 | TID*220... |
| DMP224 | 22.4 | ● | 12.56 | 22 | TID*220... |
| DMP225 | 22.5 | ● | 12.56 | 22 | TID*220... |
| DMP226 | 22.6 | ● | 12.56 | 22 | TID*220... |
| DMP227 | 22.7 | ● | 12.56 | 22 | TID*220... |
| DMP228 | 22.8 | ● | 12.56 | 22 | TID*220... |
| DMP229 | 22.9 | ● | 12.56 | 22 | TID*220... |
| DMP230 | 23 | ● | 13.13 | 23 | TID*230... |
| DMP231 | 23.1 | ● | 13.13 | 23 | TID*230... |
| DMP232 | 23.2 | ● | 13.13 | 23 | TID*230... |
| DMP233 | 23.3 | ● | 13.13 | 23 | TID*230... |
| DMP234 | 23.4 | ● | 13.13 | 23 | TID*230... |
| DMP235 | 23.5 | ● | 13.13 | 23 | TID*230... |
| DMP236 | 23.6 | ● | 13.13 | 23 | TID*230... |
| DMP237 | 23.7 | ● | 13.13 | 23 | TID*230... |
| DMP238 | 23.8 | ● | 13.13 | 23 | TID*230... |
| DMP239 | 23.9 | ● | 13.13 | 23 | TID*230... |
| DMP240 | 24 | ● | 13.7 | 24 | TID*240... |
| DMP241 | 24.1 | ● | 13.7 | 24 | TID*240... |
| DMP242 | 24.2 | ● | 13.7 | 24 | TID*240... |
| DMP243 | 24.3 | ● | 13.7 | 24 | TID*240... |
| DMP244 | 24.4 | ● | 13.7 | 24 | TID*240... |
| DMP245 | 24.5 | ● | 13.7 | 24 | TID*240... |
| DMP246 | 24.6 | ● | 13.7 | 24 | TID*240... |
| DMP247 | 24.7 | ● | 13.7 | 24 | TID*240... |
| DMP248 | 24.8 | ● | 13.7 | 24 | TID*240... |
| DMP249 | 24.9 | ● | 13.7 | 24 | TID*240... |
| DMP250 | 25 | ● | 14.3 | 25 | TID*250... |
| DMP251 | 25.1 | ● | 14.3 | 25 | TID*250... |
| DMP252 | 25.2 | ● | 14.3 | 25 | TID*250... |
| DMP253 | 25.3 | ● | 14.3 | 25 | TID*250... |
| DMP254 | 25.4 | ● | 14.3 | 25 | TID*250... |
| DMP255 | 25.5 | ● | 14.3 | 25 | TID*250... |
| DMP256 | 25.6 | ● | 14.3 | 25 | TID*250... |
| DMP257 | 25.7 | ● | 14.3 | 25 | TID*250... |
| DMP258 | 25.8 | ● | 14.3 | 25 | TID*250... |
| DMP259 | 25.9 | ● | 14.3 | 25 | TID*250... |

| Head diameter | Head diameter tolerance |
|---|---|
| ø10 - ø17.9 | +0.018 / 0 |
| ø18 - ø25.9 | +0.021 / 0 |

● : Line-up
Package Quantity: ø10 - ø19.9 = 2 pcs.
ø20 - ø25.9 = 1 pc.

## STANDARD CUTTING CONDITIONS

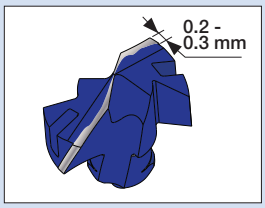
| ISO | Workpiece material | Cutting speed | Feed: *f* (mm/rev) | | | | |
|---|---|---|---|---|---|---|---|
| | | | øDc (mm) | | | | |
| | | *V*c (m/min) | ø10 - ø11.9 | ø12 - ø13.9 | ø14 - ø15.9 | ø16 - ø19.9 | ø20 - ø25.9 |
| P | Low carbon steels (C < 0.3)<br>E275A, E355D, C25, etc. | 80 - 140 | 0.15 - 0.28 | 0.18 - 0.3 | 0.2 - 0.35 | 0.25 - 0.45 | 0.25 - 0.45 |
| P | High carbon steels (C > 0.3)<br>C45, C55, etc. | 70 - 120 | 0.15 - 0.28 | 0.18 - 0.3 | 0.2 - 0.35 | 0.25 - 0.45 | 0.25 - 0.45 |
| P | Low alloy steels<br>18CrMo4, etc. | 70 - 120 | 0.14 - 0.28 | 0.16 - 0.32 | 0.18 - 0.35 | 0.23 - 0.4 | 0.25 - 0.45 |
| P | Alloy steels<br>42CrMo4, 20Cr4, etc. | 40 - 90 | 0.14 - 0.28 | 0.16 - 0.32 | 0.18 - 0.35 | 0.23 - 0.4 | 0.25 - 0.45 |
| M | Stainless steels<br>X5CrNi18-9,<br>X5CrNiMo17-12-2, etc. | 30 - 70 | 0.12 - 0.18 | 0.14 - 0.2 | 0.16 - 0.24 | 0.16 - 0.26 | 0.18 - 0.3 |
| K | Grey cast irons<br>250, etc. | 80 - 180 | 0.2 - 0.35 | 0.25 - 0.4 | 0.3 - 0.45 | 0.35 - 0.55 | 0.35 - 0.6 |
| K | Ductile cast irons<br>600-3, etc. | 80 - 140 | 0.2 - 0.35 | 0.25 - 0.4 | 0.3 - 0.45 | 0.35 - 0.55 | 0.35 - 0.6 |
| N | Aluminium alloys<br>AlSi11Cu3, etc. | 80 - 220 | 0.25 - 0.4 | 0.3 - 0.45 | 0.35 - 0.5 | 0.4 - 0.60 | 0.5 - 0.75 |
| S | Titanium alloys<br>Ti-6Al-4V, etc. | 20 - 50 | 0.08 - 0.15 | 0.1 - 0.28 | 0.12 - 0.2 | 0.14 - 0.22 | 0.18 - 0.27 |
| S | Nickel-based alloys | 20 - 50 | 0.08 - 0.13 | 0.1 - 0.15 | 0.12 - 0.18 | 0.12 - 0.22 | 0.14 - 0.22 |

- Cutting conditions in the above table show standard cutting conditions.
- Cutting conditions may change due to the rigidity and power of the machine and the workpiece material.
- Machined hole diameter may change depending upon the rigidity of the machine tool or cutting conditions.
- In case of L/D = 8,12 drill, the recommended range of cutting speeds and feeds is between the minimum and median values listed above.

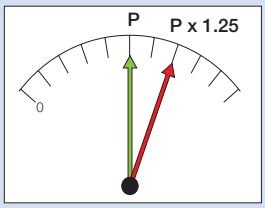
# TECHNICAL GUIDELINES

## When to change drill heads (Criteria for the end of tool life)

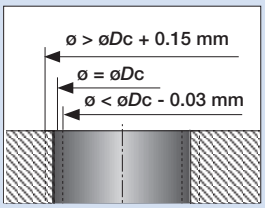
The criteria to identify the time for tool change are as follows:



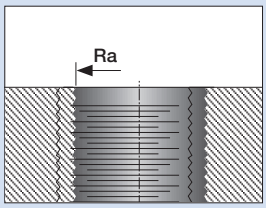

Width of corner wear reaches 0.2 – 0.3 mm.



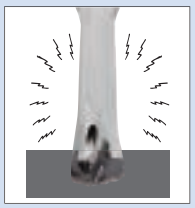

Spindle load exceeds 125% of the normal value.




Hole diameter is 0.15 mm larger or 0.03 mm smaller than the drill diameter.



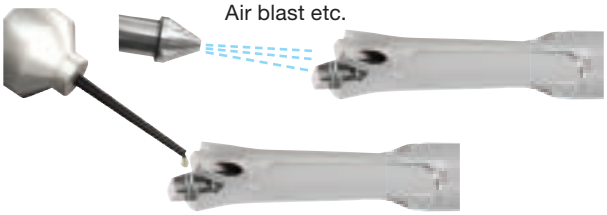

Surface roughness deteriorates.



Vibration or unusual noise occurs.

## ● How to clamp the drill head

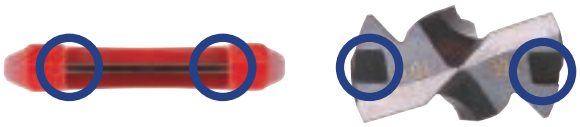
### ① Clean and lubricate the pocket.



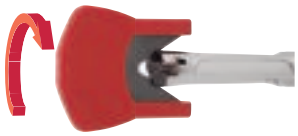

### ② Set the drill head into the pocket.



### ③ Set the clamping key on the drill head



### ④ Clamp

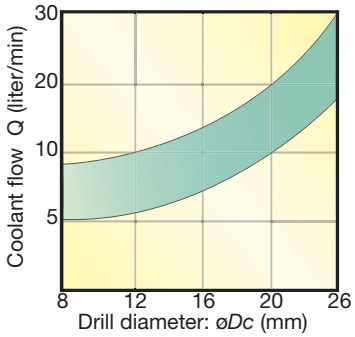


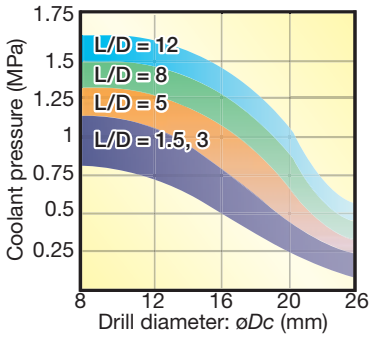
## ● Coolant supply

Internal coolant supply is recommended.

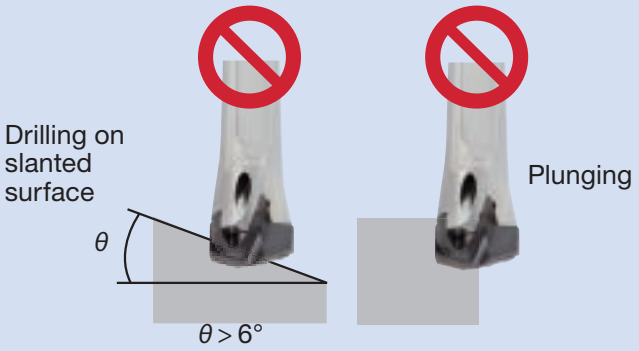


### ■ The required coolant flow and pressure



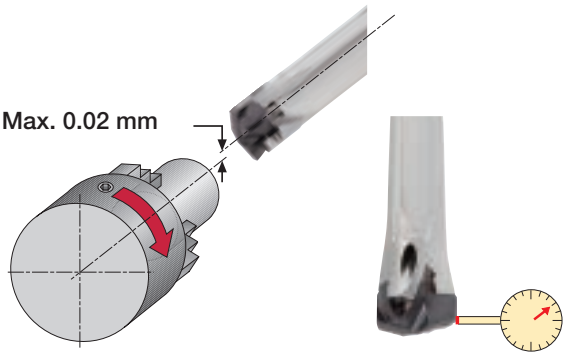



## ● Applications that are not recommended




## ● Run-out

Run-out should be less than 0.02 mm.




Ideal : ≤ 0.02 mm
Acceptable : ≤ 0.05 mm
Not acceptable: > 0.05 mm

## INSTRUCTION OF CLAMPING HEAD



Fig. #1



Fig. #2



Fig. #3

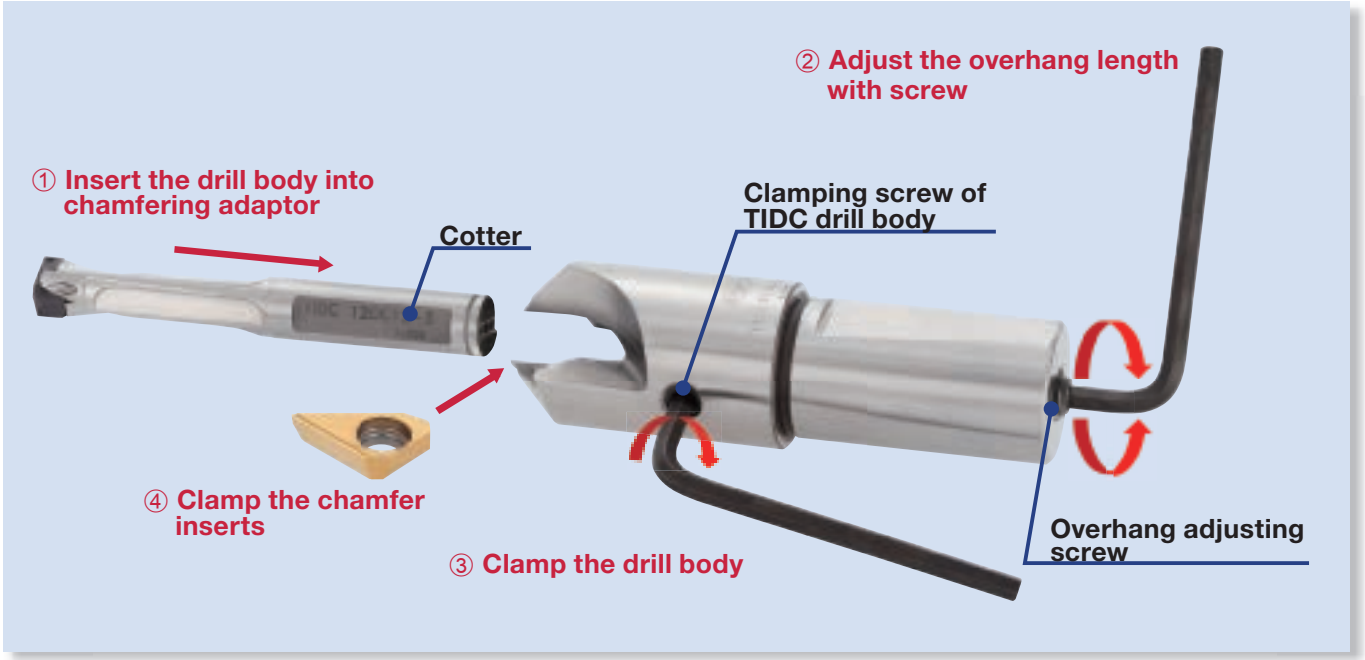
### Procedure

① Clean the clamping areas on the drill body and the head with an air blast, lubricate them, and put the drill head in the pocket.
② Set the clamping key in the groove on the drill head. Push the head toward the pocket with equal torque on the right and the left sides, and turn the clamping key to clamp the head completely. (Fig. #1)
③ Be sure that there is no gap between the bottom of the head and the drill body. A shim in the thickness of around 0.01 mm is useful to check the gap. (Fig. #2)
④ If there is a gap thicker than 0.01 mm, unclamp the head and return to the procedure No. ①
⑤ Check the run-out at the margin of the drill head. Run-out must be less than 0.05 mm. (Fig. #3) (Recommended value: less than 0.02 mm)
If the run-out exceeds 0.05 mm, unclamp the head and return to the procedure No. ① .

Note #1: If the clamping torque is not equally applied on the right and the left sides of the drill head, there may be a gap between the head and the body, which increases the run-out of the head.
Note #2: The low accuracy in holding the drill body may affect the run-out. If the run-out is large, check the accuracy in holding the drill body.

## HOW TO MOUNT THE TIDC DRILL BODY INTO THE CHAMFER ADAPTOR

The overhang length of the drill can be changed by the adjusting screw at the bottom of the adaptor.
The rear end of the drill body must be in contact with the adjusting screw as the screw supports the drill against thrust force when drilling.




### Procedure

① Place the TIDC drill body into the chamfer adaptor without chamfer inserts.
② Adjust the overhang length of the drill body with the adjusting screw at the bottom of the adaptor.
③ Adjust the position of the drill body so that the drill body is fixed at the cotter and tighten the clamping screw of the drill body. This aligns the flutes of the TIDC drill body with the chamfer inserts.
④ To clamp the chamfer inserts, tighten the clamping screw of the insert while pushing the insert into the insert pocket.

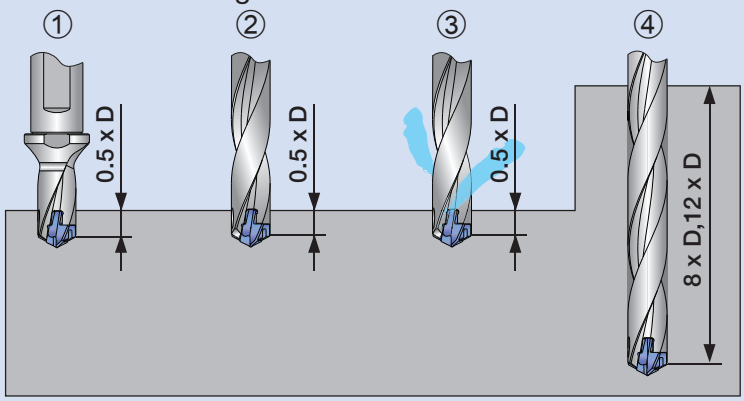
### Notice

Before removing the drill body from the adaptor, chamfer inserts must be unclamped.
The overhang adjusting screw can be handled from the top of the adaptor with flat-blade screwdriver. In this way, the overhang length of the drill body can be adjusted after the adaptor is positioned on the drill shank.



## CAUTION FOR USING DRILLS WITH L/D = 8, 12

Prior to using the drill with L/D = 8, 12 a pilot hole should be drilled with a short or centering drill.

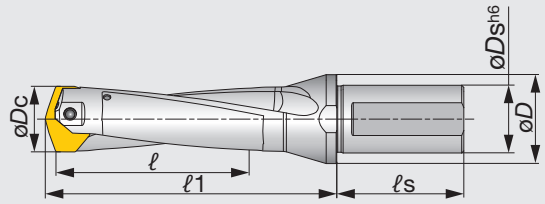



① Drill a pilot hole in the depth of 0.5 x D.
② Rotate the drill at a low speed, such as 100 $min^{-1}$, and feed it slowly into the pilot hole until the drill reaches several millimeters from the bottom.
③ Supply the coolant and rotate the drill at the recommended speed.
④ Drill the required depth under the recommended cutting conditions.

# TIS L/D=3

## Head indexable large drill






| Designation | øDc | øDs | øD | ℓ | ℓ1 | ℓs | Pocket size | Head |
|---|---|---|---|---|---|---|---|---|
| TIS260F32-3 | 26 - 26.9 | 32 | 40 | 78 | 117 | 60 | 26 | SMP26* |
| TIS270F32-3 | 27 - 27.9 | 32 | 40 | 81 | 120 | 60 | 27 | SMP27* |
| TIS280F32-3 | 28 - 28.9 | 32 | 40 | 84 | 128.4 | 60 | 28 | SMP28* |
| TIS290F32-3 | 29 - 29.9 | 32 | 40 | 87 | 131.4 | 60 | 29 | SMP29* |
| TIS300F32-3 | 30 - 30.9 | 32 | 42 | 90 | 134.7 | 60 | 30 | SMP30* |
| TIS310F32-3 | 31 - 31.9 | 32 | 42 | 93 | 137.7 | 60 | 31 | SMP31* |
| TIS320F40-3 | 32 - 32.9 | 40 | 48 | 96 | 143 | 68 | 32 | SMP32* |
| TIS330F40-3 | 33 - 33.9 | 40 | 48 | 99 | 146 | 68 | 33 | SMP33* |
| TIS340F40-3 | 34 - 34.9 | 40 | 48 | 102 | 149 | 68 | 34 | SMP34* |
| TIS350F40-3 | 35 - 35.9 | 40 | 48 | 105 | 152.4 | 68 | 35 | SMP35* |
| TIS360F40-3 | 36 - 36.9 | 40 | 48 | 108 | 155.4 | 68 | 36 | SMP36* |
| TIS370F40-3 | 37 - 37.9 | 40 | 48 | 111 | 158.4 | 68 | 37 | SMP37* |
| TIS380F40-3 | 38 - 38.9 | 40 | 50 | 114 | 166.9 | 68 | 38 | SMP38* |
| TIS390F40-3 | 39 - 39.9 | 40 | 50 | 117 | 169.9 | 68 | 39 | SMP39* |
| TIS400F40-3 | 40 - 41 | 40 | 50 | 120 | 172.9 | 68 | 40 | SMP40* |

| Tool diameter | Hole diameter tolerance* |
|---|---|
| ø26 - ø29.9 | +0.05 / 0 |
| ø30 - ø41 | +0.06 / 0 |

*Just for reference

### SPARE PARTS



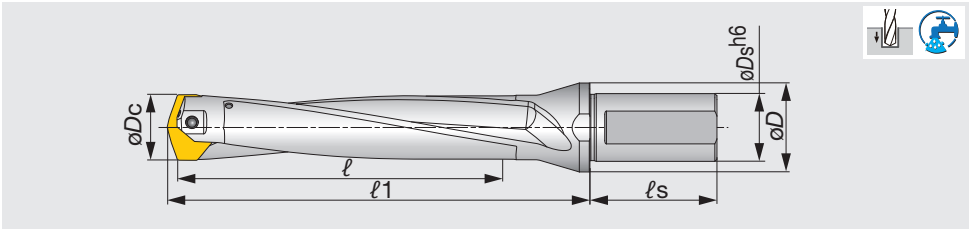


| Designation | Clamping screw | Wrench | |
|---|---|---|---|
| | | Torx Bit | Grip |
| TIS260F32-* | TS50230D3 | BLDT20/S7 | H-TB2W |
| TIS270F32-* | TS50230D3 | BLDT20/S7 | H-TB2W |
| TIS280F32-* | TS50250D35 | BLDT25/S7 | H-TB2W |
| TIS290F32-* | TS50250D35 | BLDT25/S7 | H-TB2W |
| TIS300F32-* | TS60265D4 | BLDT25/S7 | H-TB2W |
| TIS310F32-* | TS60265D4 | BLDT25/S7 | H-TB2W |
| TIS320F40-* | TS60285D42 | BLDT25/S7 | H-TB2W |
| TIS330F40-* | TS60285D42 | BLDT25/S7 | H-TB2W |
| TIS340F40-* | TS60285D42 | BLDT25/S7 | H-TB2W |
| TIS350F40-* | TS60320D5 | BLDT25/S7 | H-TB2W |
| TIS360F40-* | TS60320D5 | BLDT25/S7 | H-TB2W |
| TIS370F40-* | TS60320D5 | BLDT25/S7 | H-TB2W |
| TIS380F40-* | TS80340D6 | BLDT25/S7 | H-TB2W |
| TIS390F40-* | TS80340D6 | BLDT25/S7 | H-TB2W |
| TIS400F40-* | TS80340D6 | BLDT25/S7 | H-TB2W |

# TIS L/D=5

## Head indexable large drill






| Designation | øDc | øDs | øD | ℓ | ℓ1 | ℓs | Pocket size | Head |
|---|---|---|---|---|---|---|---|---|
| TIS260F32-5 | 26 - 26.9 | 32 | 40 | 130 | 169 | 60 | 26 | SMP26* |
| TIS270F32-5 | 27 - 27.9 | 32 | 40 | 135 | 174 | 60 | 27 | SMP27* |
| TIS280F32-5 | 28 - 28.9 | 32 | 40 | 140 | 184.4 | 60 | 28 | SMP28* |
| TIS290F32-5 | 29 - 29.9 | 32 | 40 | 145 | 189.4 | 60 | 29 | SMP29* |
| TIS300F32-5 | 30 - 30.9 | 32 | 42 | 150 | 194.7 | 60 | 30 | SMP30* |
| TIS310F32-5 | 31 - 31.9 | 32 | 42 | 155 | 199.7 | 60 | 31 | SMP31* |
| TIS320F40-5 | 32 - 32.9 | 40 | 48 | 160 | 207 | 68 | 32 | SMP32* |
| TIS330F40-5 | 33 - 33.9 | 40 | 48 | 165 | 212 | 68 | 33 | SMP33* |
| TIS340F40-5 | 34 - 34.9 | 40 | 48 | 170 | 217 | 68 | 34 | SMP34* |
| TIS350F40-5 | 35 - 35.9 | 40 | 48 | 175 | 222.4 | 68 | 35 | SMP35* |
| TIS360F40-5 | 36 - 36.9 | 40 | 48 | 180 | 227.4 | 68 | 36 | SMP36* |
| TIS370F40-5 | 37 - 37.9 | 40 | 48 | 185 | 232.4 | 68 | 37 | SMP37* |
| TIS380F40-5 | 38 - 38.9 | 40 | 50 | 190 | 242.9 | 68 | 38 | SMP38* |
| TIS390F40-5 | 39 - 39.9 | 40 | 50 | 195 | 247.9 | 68 | 39 | SMP39* |
| TIS400F40-5 | 40 - 41 | 40 | 50 | 200 | 252.9 | 68 | 40 | SMP40* |

| Tool diameter | Hole diameter tolerance* |
|---|---|
| ø26 - ø29.9 | +0.08 / 0 |
| ø30 - ø41 | +0.09 / 0 |

*Just for reference

### SPARE PARTS

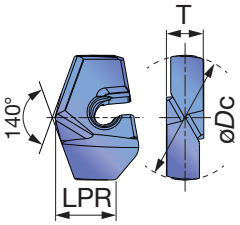




| Designation | Clamping screw | Wrench | |
|---|---|---|---|
| | | Torx Bit | Grip |
| TIS260F32-* | TS50230D3 | BLDT20/S7 | H-TB2W |
| TIS270F32-* | TS50230D3 | BLDT20/S7 | H-TB2W |
| TIS280F32-* | TS50250D35 | BLDT25/S7 | H-TB2W |
| TIS290F32-* | TS50250D35 | BLDT25/S7 | H-TB2W |
| TIS300F32-* | TS60265D4 | BLDT25/S7 | H-TB2W |
| TIS310F32-* | TS60265D4 | BLDT25/S7 | H-TB2W |
| TIS320F40-* | TS60285D42 | BLDT25/S7 | H-TB2W |
| TIS330F40-* | TS60285D42 | BLDT25/S7 | H-TB2W |
| TIS340F40-* | TS60285D42 | BLDT25/S7 | H-TB2W |
| TIS350F40-* | TS60320D5 | BLDT25/S7 | H-TB2W |
| TIS360F40-* | TS60320D5 | BLDT25/S7 | H-TB2W |
| TIS370F40-* | TS60320D5 | BLDT25/S7 | H-TB2W |
| TIS380F40-* | TS80340D6 | BLDT25/S7 | H-TB2W |
| TIS390F40-* | TS80340D6 | BLDT25/S7 | H-TB2W |
| TIS400F40-* | TS80340D6 | BLDT25/S7 | H-TB2W |

## SMP






| Designation | øDc | AH725 | T | LPR | Pocket size | Body |
|---|---|---|---|---|---|---|
| SMP260 | 26 | ● | 7.5 | 11.6 | 26 | TIS260F32-* |
| SMP261 | 26.1 | ● | 7.5 | 11.6 | 26 | TIS260F32-* |
| SMP265 | 26.5 | ● | 7.5 | 11.6 | 26 | TIS260F32-* |
| SMP267 | 26.7 | ● | 7.5 | 11.6 | 26 | TIS260F32-* |
| SMP270 | 27 | ● | 7.5 | 11.1 | 27 | TIS270F32-* |
| SMP271 | 27.1 | ● | 7.5 | 11.1 | 27 | TIS270F32-* |
| SMP272 | 27.2 | ● | 7.5 | 11.1 | 27 | TIS270F32-* |
| SMP275 | 27.5 | ● | 7.5 | 11.1 | 27 | TIS270F32-* |
| SMP280 | 28 | ● | 8 | 11.7 | 28 | TIS280F32-* |
| SMP281 | 28.1 | ● | 8 | 11.7 | 28 | TIS280F32-* |
| SMP285 | 28.5 | ● | 8 | 11.7 | 28 | TIS280F32-* |
| SMP286 | 28.6 | ● | 8 | 11.7 | 28 | TIS280F32-* |
| SMP290 | 29 | ● | 8 | 11.3 | 29 | TIS290F32-* |
| SMP291 | 29.1 | ● | 8 | 11.3 | 29 | TIS290F32-* |
| SMP295 | 29.5 | ● | 8 | 11.3 | 29 | TIS290F32-* |
| SMP296 | 29.6 | ● | 8 | 11.3 | 29 | TIS290F32-* |
| SMP300 | 30 | ● | 8.5 | 14.1 | 30 | TIS300F32-* |
| SMP301 | 30.1 | ● | 8.5 | 14.1 | 30 | TIS300F32-* |
| SMP302 | 30.2 | ● | 8.5 | 14.1 | 30 | TIS300F32-* |
| SMP303 | 30.3 | ● | 8.5 | 14.1 | 30 | TIS300F32-* |
| SMP305 | 30.5 | ● | 8.5 | 14.1 | 30 | TIS300F32-* |
| SMP308 | 30.8 | ● | 8.5 | 14.1 | 30 | TIS300F32-* |
| SMP310 | 31 | ● | 8.5 | 13.7 | 31 | TIS310F32-* |
| SMP311 | 31.1 | ● | 8.5 | 13.7 | 31 | TIS310F32-* |
| SMP315 | 31.5 | ● | 8.5 | 13.7 | 31 | TIS310F32-* |
| SMP318 | 31.8 | ● | 8.5 | 13.7 | 31 | TIS310F32-* |
| SMP320 | 32 | ● | 9 | 14.5 | 32 | TIS320F40-* |
| SMP321 | 32.1 | ● | 9 | 14.5 | 32 | TIS320F40-* |
| SMP325 | 32.5 | ● | 9 | 14.5 | 32 | TIS320F40-* |
| SMP328 | 32.8 | ● | 9 | 14.5 | 32 | TIS320F40-* |
| SMP330 | 33 | ● | 9 | 14.1 | 33 | TIS330F40-* |
| SMP331 | 33.1 | ● | 9 | 14.1 | 33 | TIS330F40-* |
| SMP333 | 33.3 | ● | 9 | 14.1 | 33 | TIS330F40-* |
| SMP335 | 33.5 | ● | 9 | 14.1 | 33 | TIS330F40-* |
| SMP340 | 34 | ● | 9 | 13.7 | 34 | TIS340F40-* |
| SMP341 | 34.1 | ● | 9 | 13.7 | 34 | TIS340F40-* |
| SMP345 | 34.5 | ● | 9 | 13.7 | 34 | TIS340F40-* |
| SMP349 | 34.9 | ● | 9 | 13.7 | 34 | TIS340F40-* |
| SMP350 | 35 | ● | 10 | 16.6 | 35 | TIS350F40-* |
| SMP351 | 35.1 | ● | 10 | 16.6 | 35 | TIS350F40-* |
| SMP355 | 35.5 | ● | 10 | 16.6 | 35 | TIS350F40-* |
| SMP360 | 36 | ● | 10 | 16.1 | 36 | TIS360F40-* |
| SMP361 | 36.1 | ● | 10 | 16.1 | 36 | TIS360F40-* |
| SMP365 | 36.5 | ● | 10 | 16.1 | 36 | TIS360F40-* |
| SMP366 | 36.6 | ● | 10 | 16.1 | 36 | TIS360F40-* |
| SMP370 | 37 | ● | 10 | 15.7 | 37 | TIS370F40-* |
| SMP371 | 37.1 | ● | 10 | 15.7 | 37 | TIS370F40-* |
| SMP375 | 37.5 | ● | 10 | 15.7 | 37 | TIS370F40-* |
| SMP380 | 38 | ● | 10.5 | 17 | 38 | TIS380F40-* |
| SMP381 | 38.1 | ● | 10.5 | 17 | 38 | TIS380F40-* |
| SMP385 | 38.5 | ● | 10.5 | 17 | 38 | TIS380F40-* |
| SMP388 | 38.8 | ● | 10.5 | 17 | 38 | TIS380F40-* |
| SMP390 | 39 | ● | 10.5 | 16.6 | 39 | TIS390F40-* |
| SMP391 | 39.1 | ● | 10.5 | 16.6 | 39 | TIS390F40-* |

| Designation | øDc | AH725 | T | LPR | Pocket size | Body |
|---|---|---|---|---|---|---|
| SMP395 | 39.5 | ● | 10.5 | 16.6 | 39 | TIS390F40-* |
| SMP397 | 39.7 | ● | 10.5 | 16.6 | 39 | TIS390F40-* |
| SMP398 | 39.8 | ● | 10.5 | 16.6 | 39 | TIS390F40-* |
| SMP400 | 40 | ● | 10.5 | 16.2 | 40 | TIS400F40-* |
| SMP401 | 40.1 | ● | 10.5 | 16.2 | 40 | TIS400F40-* |
| SMP405 | 40.5 | ● | 10.5 | 16.2 | 40 | TIS400F40-* |
| SMP410 | 41 | ● | 10.5 | 16.2 | 40 | TIS400F40-* |

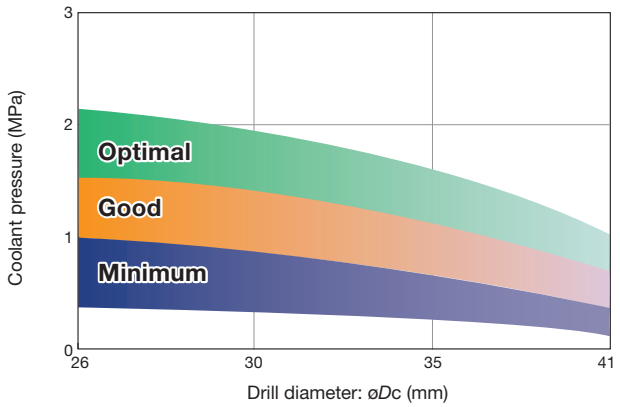
| Tool diameter | Head diameter tolerance |
|---|---|
| ø26 - ø29.9 | -0.006 / -0.026 |
| ø30 - ø41 | -0.006 / -0.031 |

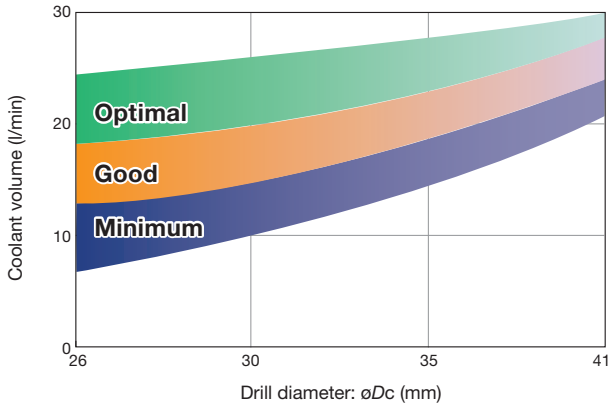
● : Line-up
Package quantity =1pc

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Cutting speed *Vc* (m/min) | Feed: *f* (mm/rev) | | |
|---|---|---|---|---|---|
| | | | *øDc* (mm) | | |
| | | | ø26 - ø29.9 | ø30 - ø35.9 | ø36 - ø41 |
| P | Low carbon steels<br>C15, C20, etc. | 80 - 140 | 0.2 - 0.5 | 0.2 - 0.5 | 0.2 - 0.55 |
| P | Carbon steels, Alloy steels<br>C55, 42CrMoS4, etc. | 80 - 130 | 0.2 - 0.5 | 0.2 - 0.5 | 0.2 - 0.55 |
| P | Prehardened steels<br>NAK80, PX5, etc. | 50 - 100 | 0.2 - 0.5 | 0.2 - 0.5 | 0.2 - 0.55 |
| M | Stainless steels<br>X5CrNi18-9, X5CrNiMo17-12-2, etc | 40 - 80 | 0.15 - 0.3 | 0.15 - 0.3 | 0.2 - 0.35 |
| K | Grey cast irons<br>250, 300, etc. | 80 - 180 | 0.25 - 0.55 | 0.25 - 0.55 | 0.3 - 0.6 |
| K | Ductile cast irons<br>400-15, 600-3, etc. | 80 - 140 | 0.25 - 0.55 | 0.25 - 0.55 | 0.3 - 0.6 |
| N | Non ferrous materials | 100 - 200 | 0.4 - 0.6 | 0.4 - 0.6 | 0.5 - 0.7 |
| S | Heat-resistant alloy<br>Inconel718, etc. | 20 - 50 | 0.1 - 0.2 | 0.1 - 0.2 | 0.1 - 0.25 |
| S | Titanium alloys<br>Ti-6Al-4V, etc. | 30 - 60 | 0.1 - 0.3 | 0.1 - 0.3 | 0.1 - 0.35 |
| H | Hardened materials | 20 - 60 | 0.1 - 0.2 | 0.1 - 0.2 | 0.1 - 0.25 |

## RECOMMENDED COOLANT PRESSURE AND VOLUME



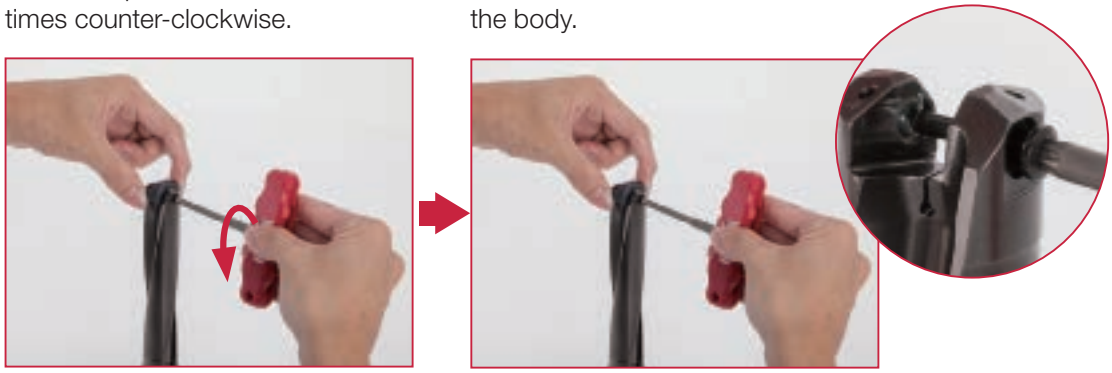






## HOW TO CHANGE DRILL HEAD

To unclamp rotate the screw 3-5 times counter-clockwise.

No need to remove the screw from the body.



- Please change the screw to new one when the screw does not rotate smoothly

MEMO

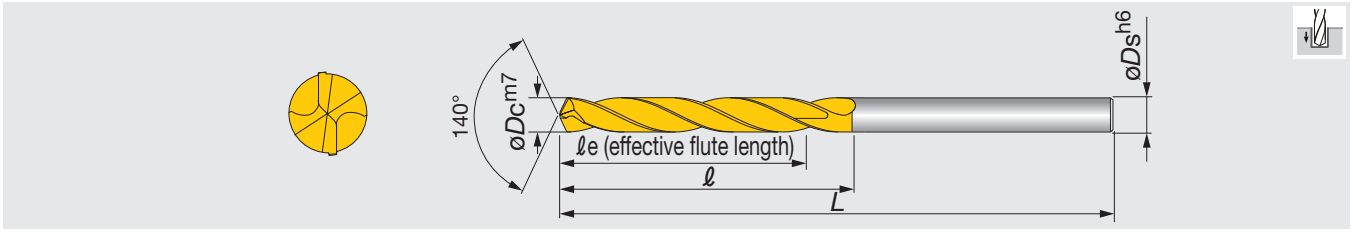
# SOLIDDRILL Quick Guide

| Series | ød (mm) | L/D | Point Angle | Oil Hole | Coating | Un coated | Description | P | M | K | N | S | H | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DSM<br>DSM-CP | ø0.1 - ø3 | 5, 10, 15 | 140<br>90 & 140 | | ● | | Micro solid drill with ø3 mm shanks<br>DSM-CP: Centering drill for DSM | ● | ● | ● | ● | ● | ● | E048 - E051 |
| DSW | ø3 - ø16 | 3, 5, 8 | 140 | With, Without | ● | | Shank size: DIN | ● | ● | ● | ● | ● | ● | E026 - E034 |
| DSX | ø3 - ø20 | 3, 5, 8 | 130 | With | ● | | Shank size: 1.0 mm increments | ● | ● | ● | ● | ● | ● | E038 - E043 |
| DSE | ø3 - ø16 | 2, 3 | 140 | | ● | | For drilling thin plates with low cutting force<br>Shank size: Same as the drill diameter | ● | ● | ● | ● | ● | ● | E044 - E047 |
| DMX | ø3 - ø16 | 2, 3 | 130 | | ● | | Shank size: Same as the drill diameter | ● | ● | ● | ● | ● | ● | E052 - E055 |
| DMD-S | ø6 - ø13 | 3 | 135 | | | ● | Helix angle 15° | | | | | | ● | E056, E057 |
| DMX-F | ø3 - ø20 | 3, 5 | 130 | | | ● | Shank size: Same as the drill diameter | | | ● | ● | | | E058 - E062 |
| FDS | ø2.57 - ø11 | 3 | 135 | | | ● | Drills for reaming pre-tap holes with straight flute | | | ● | ● | | | E063 |
| FDC | ø5 - ø16 | 5, 8 | 135 | With | | ● | Drills for reaming at high feed with straight flute | | | ● | ● | | | E064, E065 |
| CDS | ø0.4 - ø13 | 5 - 12 | 120 | | | ● | Shank size: Same as the drill diameter<br>Hole depth: Up to L/D 12 | | | ● | ● | | | E066 - E068 |

# SOLIDDRILL

## DSW-DE3

Soliddrill with 140° point angle without oil hole & DIN shank, L/D = 3, dia = ø3 - ø16 mm




| Designation | øDc | AH725 | øDs | ℓe | ℓ | L | Designation | øDc | AH725 | øDs | ℓe | ℓ | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DSW030-014-06DE3 | 3 | ● | 6 | 14 | 20 | 62 | DSW082-035-10DE3 | 8.2 | ● | 10 | 35 | 47 | 89 |
| DSW031-014-06DE3 | 3.1 | ● | 6 | 14 | 20 | 62 | DSW083-035-10DE3 | 8.3 | ● | 10 | 35 | 47 | 89 |
| DSW032-014-06DE3 | 3.2 | ● | 6 | 14 | 20 | 62 | DSW084-035-10DE3 | 8.4 | ● | 10 | 35 | 47 | 89 |
| DSW033-014-06DE3 | 3.3 | ● | 6 | 14 | 20 | 62 | DSW085-035-10DE3 | 8.5 | ● | 10 | 35 | 47 | 89 |
| DSW034-014-06DE3 | 3.4 | ● | 6 | 14 | 20 | 62 | DSW086-035-10DE3 | 8.6 | ● | 10 | 35 | 47 | 89 |
| DSW035-014-06DE3 | 3.5 | ● | 6 | 14 | 20 | 62 | DSW087-035-10DE3 | 8.7 | ● | 10 | 35 | 47 | 89 |
| DSW036-014-06DE3 | 3.6 | ● | 6 | 14 | 20 | 62 | DSW088-035-10DE3 | 8.8 | ● | 10 | 35 | 47 | 89 |
| DSW037-014-06DE3 | 3.7 | ● | 6 | 14 | 20 | 62 | DSW089-035-10DE3 | 8.9 | ● | 10 | 35 | 47 | 89 |
| DSW038-017-06DE3 | 3.8 | ● | 6 | 17 | 24 | 66 | DSW090-035-10DE3 | 9 | ● | 10 | 35 | 47 | 89 |
| DSW039-017-06DE3 | 3.9 | ● | 6 | 17 | 24 | 66 | DSW091-035-10DE3 | 9.1 | ● | 10 | 35 | 47 | 89 |
| DSW040-017-06DE3 | 4 | ● | 6 | 17 | 24 | 66 | DSW092-035-10DE3 | 9.2 | ● | 10 | 35 | 47 | 89 |
| DSW041-017-06DE3 | 4.1 | ● | 6 | 17 | 24 | 66 | DSW093-035-10DE3 | 9.3 | ● | 10 | 35 | 47 | 89 |
| DSW042-017-06DE3 | 4.2 | ● | 6 | 17 | 24 | 66 | DSW094-035-10DE3 | 9.4 | ● | 10 | 35 | 47 | 89 |
| DSW043-017-06DE3 | 4.3 | ● | 6 | 17 | 24 | 66 | DSW095-035-10DE3 | 9.5 | ● | 10 | 35 | 47 | 89 |
| DSW044-017-06DE3 | 4.4 | ● | 6 | 17 | 24 | 66 | DSW096-035-10DE3 | 9.6 | ● | 10 | 35 | 47 | 89 |
| DSW045-017-06DE3 | 4.5 | ● | 6 | 17 | 24 | 66 | DSW097-035-10DE3 | 9.7 | ● | 10 | 35 | 47 | 89 |
| DSW046-017-06DE3 | 4.6 | ● | 6 | 17 | 24 | 66 | DSW098-035-10DE3 | 9.8 | ● | 10 | 35 | 47 | 89 |
| DSW047-017-06DE3 | 4.7 | ● | 6 | 17 | 24 | 66 | DSW099-035-10DE3 | 9.9 | ● | 10 | 35 | 47 | 89 |
| DSW048-020-06DE3 | 4.8 | ● | 6 | 20 | 28 | 66 | DSW100-035-10DE3 | 10 | ● | 10 | 35 | 47 | 89 |
| DSW049-020-06DE3 | 4.9 | ● | 6 | 20 | 28 | 66 | DSW101-040-12DE3 | 10.1 | ● | 12 | 40 | 55 | 102 |
| DSW050-020-06DE3 | 5 | ● | 6 | 20 | 28 | 66 | DSW102-040-12DE3 | 10.2 | ● | 12 | 40 | 55 | 102 |
| DSW051-020-06DE3 | 5.1 | ● | 6 | 20 | 28 | 66 | DSW103-040-12DE3 | 10.3 | ● | 12 | 40 | 55 | 102 |
| DSW052-020-06DE3 | 5.2 | ● | 6 | 20 | 28 | 66 | DSW104-040-12DE3 | 10.4 | ● | 12 | 40 | 55 | 102 |
| DSW053-020-06DE3 | 5.3 | ● | 6 | 20 | 28 | 66 | DSW105-040-12DE3 | 10.5 | ● | 12 | 40 | 55 | 102 |
| DSW054-020-06DE3 | 5.4 | ● | 6 | 20 | 28 | 66 | DSW106-040-12DE3 | 10.6 | ● | 12 | 40 | 55 | 102 |
| DSW055-020-06DE3 | 5.5 | ● | 6 | 20 | 28 | 66 | DSW107-040-12DE3 | 10.7 | ● | 12 | 40 | 55 | 102 |
| DSW056-020-06DE3 | 5.6 | ● | 6 | 20 | 28 | 66 | DSW108-040-12DE3 | 10.8 | ● | 12 | 40 | 55 | 102 |
| DSW057-020-06DE3 | 5.7 | ● | 6 | 20 | 28 | 66 | DSW109-040-12DE3 | 10.9 | ● | 12 | 40 | 55 | 102 |
| DSW058-020-06DE3 | 5.8 | ● | 6 | 20 | 28 | 66 | DSW110-040-12DE3 | 11 | ● | 12 | 40 | 55 | 102 |
| DSW059-020-06DE3 | 5.9 | ● | 6 | 20 | 28 | 66 | DSW111-040-12DE3 | 11.1 | ● | 12 | 40 | 55 | 102 |
| DSW060-020-06DE3 | 6 | ● | 6 | 20 | 28 | 66 | DSW112-040-12DE3 | 11.2 | ● | 12 | 40 | 55 | 102 |
| DSW061-024-08DE3 | 6.1 | ● | 8 | 24 | 34 | 79 | DSW113-040-12DE3 | 11.3 | ● | 12 | 40 | 55 | 102 |
| DSW062-024-08DE3 | 6.2 | ● | 8 | 24 | 34 | 79 | DSW114-040-12DE3 | 11.4 | ● | 12 | 40 | 55 | 102 |
| DSW063-024-08DE3 | 6.3 | ● | 8 | 24 | 34 | 79 | DSW115-040-12DE3 | 11.5 | ● | 12 | 40 | 55 | 102 |
| DSW064-024-08DE3 | 6.4 | ● | 8 | 24 | 34 | 79 | DSW116-040-12DE3 | 11.6 | ● | 12 | 40 | 55 | 102 |
| DSW065-024-08DE3 | 6.5 | ● | 8 | 24 | 34 | 79 | DSW117-040-12DE3 | 11.7 | ● | 12 | 40 | 55 | 102 |
| DSW066-024-08DE3 | 6.6 | ● | 8 | 24 | 34 | 79 | DSW118-040-12DE3 | 11.8 | ● | 12 | 40 | 55 | 102 |
| DSW067-024-08DE3 | 6.7 | ● | 8 | 24 | 34 | 79 | DSW119-040-12DE3 | 11.9 | ● | 12 | 40 | 55 | 102 |
| DSW068-024-08DE3 | 6.8 | ● | 8 | 24 | 34 | 79 | DSW120-040-12DE3 | 12 | ● | 12 | 40 | 55 | 102 |
| DSW069-024-08DE3 | 6.9 | ● | 8 | 24 | 34 | 79 | DSW121-043-14DE3 | 12.1 | ● | 14 | 43 | 60 | 107 |
| DSW070-024-08DE3 | 7 | ● | 8 | 24 | 34 | 79 | DSW122-043-14DE3 | 12.2 | ● | 14 | 43 | 60 | 107 |
| DSW071-029-08DE3 | 7.1 | ● | 8 | 29 | 41 | 79 | DSW123-043-14DE3 | 12.3 | ● | 14 | 43 | 60 | 107 |
| DSW072-029-08DE3 | 7.2 | ● | 8 | 29 | 41 | 79 | DSW124-043-14DE3 | 12.4 | ● | 14 | 43 | 60 | 107 |
| DSW073-029-08DE3 | 7.3 | ● | 8 | 29 | 41 | 79 | DSW125-043-14DE3 | 12.5 | ● | 14 | 43 | 60 | 107 |
| DSW074-029-08DE3 | 7.4 | ● | 8 | 29 | 41 | 79 | DSW126-043-14DE3 | 12.6 | ● | 14 | 43 | 60 | 107 |
| DSW075-029-08DE3 | 7.5 | ● | 8 | 29 | 41 | 79 | DSW127-043-14DE3 | 12.7 | ● | 14 | 43 | 60 | 107 |
| DSW076-029-08DE3 | 7.6 | ● | 8 | 29 | 41 | 79 | DSW128-043-14DE3 | 12.8 | ● | 14 | 43 | 60 | 107 |
| DSW077-029-08DE3 | 7.7 | ● | 8 | 29 | 41 | 79 | DSW129-043-14DE3 | 12.9 | ● | 14 | 43 | 60 | 107 |
| DSW078-029-08DE3 | 7.8 | ● | 8 | 29 | 41 | 79 | DSW130-043-14DE3 | 13 | ● | 14 | 43 | 60 | 107 |
| DSW079-029-08DE3 | 7.9 | ● | 8 | 29 | 41 | 79 | DSW131-043-14DE3 | 13.1 | ● | 14 | 43 | 60 | 107 |
| DSW080-029-08DE3 | 8 | ● | 8 | 29 | 41 | 79 | DSW132-043-14DE3 | 13.2 | ● | 14 | 43 | 60 | 107 |
| DSW081-035-10DE3 | 8.1 | ● | 10 | 35 | 47 | 89 | DSW133-043-14DE3 | 13.3 | ● | 14 | 43 | 60 | 107 |

● : Line-up

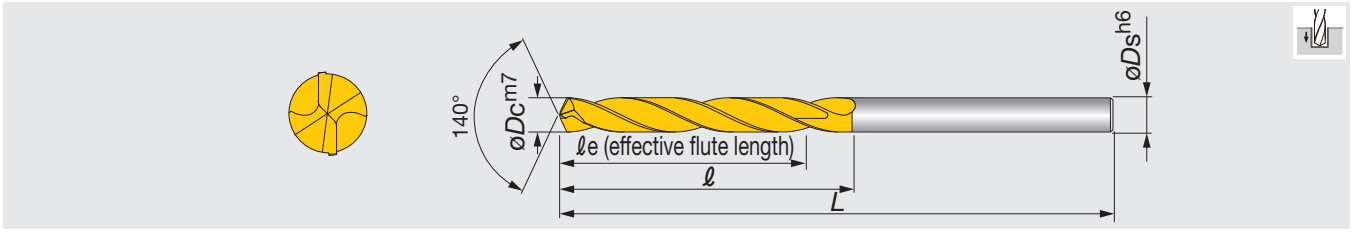
| Designation | øDc | AH725 | øDs | ℓe | ℓ | L |
|---|---|---|---|---|---|---|
| DSW134-043-14DE3 | 13.4 | ● | 14 | 43 | 60 | 107 |
| DSW135-043-14DE3 | 13.5 | ● | 14 | 43 | 60 | 107 |
| DSW136-043-14DE3 | 13.6 | ● | 14 | 43 | 60 | 107 |
| DSW137-043-14DE3 | 13.7 | ● | 14 | 43 | 60 | 107 |
| DSW138-043-14DE3 | 13.8 | ● | 14 | 43 | 60 | 107 |
| DSW139-043-14DE3 | 13.9 | ● | 14 | 43 | 60 | 107 |
| DSW140-043-14DE3 | 14 | ● | 14 | 43 | 60 | 107 |
| DSW141-045-16DE3 | 14.1 | ● | 16 | 45 | 65 | 115 |
| DSW142-045-16DE3 | 14.2 | ● | 16 | 45 | 65 | 115 |
| DSW143-045-16DE3 | 14.3 | ● | 16 | 45 | 65 | 115 |
| DSW144-045-16DE3 | 14.4 | ● | 16 | 45 | 65 | 115 |
| DSW145-045-16DE3 | 14.5 | ● | 16 | 45 | 65 | 115 |
| DSW146-045-16DE3 | 14.6 | ● | 16 | 45 | 65 | 115 |
| DSW147-045-16DE3 | 14.7 | ● | 16 | 45 | 65 | 115 |
| DSW148-045-16DE3 | 14.8 | ● | 16 | 45 | 65 | 115 |
| DSW149-045-16DE3 | 14.9 | ● | 16 | 45 | 65 | 115 |
| DSW150-045-16DE3 | 15 | ● | 16 | 45 | 65 | 115 |
| DSW151-045-16DE3 | 15.1 | ● | 16 | 45 | 65 | 115 |
| DSW152-045-16DE3 | 15.2 | ● | 16 | 45 | 65 | 115 |
| DSW153-045-16DE3 | 15.3 | ● | 16 | 45 | 65 | 115 |
| DSW154-045-16DE3 | 15.4 | ● | 16 | 45 | 65 | 115 |
| DSW155-045-16DE3 | 15.5 | ● | 16 | 45 | 65 | 115 |
| DSW156-045-16DE3 | 15.6 | ● | 16 | 45 | 65 | 115 |
| DSW157-045-16DE3 | 15.7 | ● | 16 | 45 | 65 | 115 |
| DSW158-045-16DE3 | 15.8 | ● | 16 | 45 | 65 | 115 |
| DSW159-045-16DE3 | 15.9 | ● | 16 | 45 | 65 | 115 |
| DSW160-045-16DE3 | 16 | ● | 16 | 45 | 65 | 115 |

● : Line-up

# SOLIDDRILL

## DSW-DE5

Soliddrill with 140° point angle without oil hole & DIN shank, L/D = 5, dia = ø3 - ø16 mm




| Designation | øDc | AH725 | øDs | ℓe | ℓ | L | Designation | øDc | AH725 | øDs | ℓe | ℓ | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DSW030-023-06DE5 | 3 | ● | 6 | 23 | 28 | 66 | DSW082-049-10DE5 | 8.2 | ● | 10 | 49 | 61 | 103 |
| DSW031-023-06DE5 | 3.1 | ● | 6 | 23 | 28 | 66 | DSW083-049-10DE5 | 8.3 | ● | 10 | 49 | 61 | 103 |
| DSW032-023-06DE5 | 3.2 | ● | 6 | 23 | 28 | 66 | DSW084-049-10DE5 | 8.4 | ● | 10 | 49 | 61 | 103 |
| DSW033-023-06DE5 | 3.3 | ● | 6 | 23 | 28 | 66 | DSW085-049-10DE5 | 8.5 | ● | 10 | 49 | 61 | 103 |
| DSW034-023-06DE5 | 3.4 | ● | 6 | 23 | 28 | 66 | DSW086-049-10DE5 | 8.6 | ● | 10 | 49 | 61 | 103 |
| DSW035-023-06DE5 | 3.5 | ● | 6 | 23 | 28 | 66 | DSW087-049-10DE5 | 8.7 | ● | 10 | 49 | 61 | 103 |
| DSW036-023-06DE5 | 3.6 | ● | 6 | 23 | 28 | 66 | DSW088-049-10DE5 | 8.8 | ● | 10 | 49 | 61 | 103 |
| DSW037-023-06DE5 | 3.7 | ● | 6 | 23 | 28 | 66 | DSW089-049-10DE5 | 8.9 | ● | 10 | 49 | 61 | 103 |
| DSW038-029-06DE5 | 3.8 | ● | 6 | 29 | 36 | 74 | DSW090-049-10DE5 | 9 | ● | 10 | 49 | 61 | 103 |
| DSW039-029-06DE5 | 3.9 | ● | 6 | 29 | 36 | 74 | DSW091-049-10DE5 | 9.1 | ● | 10 | 49 | 61 | 103 |
| DSW040-029-06DE5 | 4 | ● | 6 | 29 | 36 | 74 | DSW092-049-10DE5 | 9.2 | ● | 10 | 49 | 61 | 103 |
| DSW041-029-06DE5 | 4.1 | ● | 6 | 29 | 36 | 74 | DSW093-049-10DE5 | 9.3 | ● | 10 | 49 | 61 | 103 |
| DSW042-029-06DE5 | 4.2 | ● | 6 | 29 | 36 | 74 | DSW094-049-10DE5 | 9.4 | ● | 10 | 49 | 61 | 103 |
| DSW043-029-06DE5 | 4.3 | ● | 6 | 29 | 36 | 74 | DSW095-049-10DE5 | 9.5 | ● | 10 | 49 | 61 | 103 |
| DSW044-029-06DE5 | 4.4 | ● | 6 | 29 | 36 | 74 | DSW096-049-10DE5 | 9.6 | ● | 10 | 49 | 61 | 103 |
| DSW045-029-06DE5 | 4.5 | ● | 6 | 29 | 36 | 74 | DSW097-049-10DE5 | 9.7 | ● | 10 | 49 | 61 | 103 |
| DSW046-029-06DE5 | 4.6 | ● | 6 | 29 | 36 | 74 | DSW098-049-10DE5 | 9.8 | ● | 10 | 49 | 61 | 103 |
| DSW047-029-06DE5 | 4.7 | ● | 6 | 29 | 36 | 74 | DSW099-049-10DE5 | 9.9 | ● | 10 | 49 | 61 | 103 |
| DSW048-035-06DE5 | 4.8 | ● | 6 | 35 | 44 | 82 | DSW100-049-10DE5 | 10 | ● | 10 | 49 | 61 | 103 |
| DSW049-035-06DE5 | 4.9 | ● | 6 | 35 | 44 | 82 | DSW101-056-12DE5 | 10.1 | ● | 12 | 56 | 71 | 118 |
| DSW050-035-06DE5 | 5 | ● | 6 | 35 | 44 | 82 | DSW102-056-12DE5 | 10.2 | ● | 12 | 56 | 71 | 118 |
| DSW051-035-06DE5 | 5.1 | ● | 6 | 35 | 44 | 82 | DSW103-056-12DE5 | 10.3 | ● | 12 | 56 | 71 | 118 |
| DSW052-035-06DE5 | 5.2 | ● | 6 | 35 | 44 | 82 | DSW104-056-12DE5 | 10.4 | ● | 12 | 56 | 71 | 118 |
| DSW053-035-06DE5 | 5.3 | ● | 6 | 35 | 44 | 82 | DSW105-056-12DE5 | 10.5 | ● | 12 | 56 | 71 | 118 |
| DSW054-035-06DE5 | 5.4 | ● | 6 | 35 | 44 | 82 | DSW106-056-12DE5 | 10.6 | ● | 12 | 56 | 71 | 118 |
| DSW055-035-06DE5 | 5.5 | ● | 6 | 35 | 44 | 82 | DSW107-056-12DE5 | 10.7 | ● | 12 | 56 | 71 | 118 |
| DSW056-035-06DE5 | 5.6 | ● | 6 | 35 | 44 | 82 | DSW108-056-12DE5 | 10.8 | ● | 12 | 56 | 71 | 118 |
| DSW057-035-06DE5 | 5.7 | ● | 6 | 35 | 44 | 82 | DSW109-056-12DE5 | 10.9 | ● | 12 | 56 | 71 | 118 |
| DSW058-035-06DE5 | 5.8 | ● | 6 | 35 | 44 | 82 | DSW110-056-12DE5 | 11 | ● | 12 | 56 | 71 | 118 |
| DSW059-035-06DE5 | 5.9 | ● | 6 | 35 | 44 | 82 | DSW111-056-12DE5 | 11.1 | ● | 12 | 56 | 71 | 118 |
| DSW060-035-06DE5 | 6 | ● | 6 | 35 | 44 | 82 | DSW112-056-12DE5 | 11.2 | ● | 12 | 56 | 71 | 118 |
| DSW061-043-08DE5 | 6.1 | ● | 8 | 43 | 53 | 91 | DSW113-056-12DE5 | 11.3 | ● | 12 | 56 | 71 | 118 |
| DSW062-043-08DE5 | 6.2 | ● | 8 | 43 | 53 | 91 | DSW114-056-12DE5 | 11.4 | ● | 12 | 56 | 71 | 118 |
| DSW063-043-08DE5 | 6.3 | ● | 8 | 43 | 53 | 91 | DSW115-056-12DE5 | 11.5 | ● | 12 | 56 | 71 | 118 |
| DSW064-043-08DE5 | 6.4 | ● | 8 | 43 | 53 | 91 | DSW116-056-12DE5 | 11.6 | ● | 12 | 56 | 71 | 118 |
| DSW065-043-08DE5 | 6.5 | ● | 8 | 43 | 53 | 91 | DSW117-056-12DE5 | 11.7 | ● | 12 | 56 | 71 | 118 |
| DSW066-043-08DE5 | 6.6 | ● | 8 | 43 | 53 | 91 | DSW118-056-12DE5 | 11.8 | ● | 12 | 56 | 71 | 118 |
| DSW067-043-08DE5 | 6.7 | ● | 8 | 43 | 53 | 91 | DSW119-056-12DE5 | 11.9 | ● | 12 | 56 | 71 | 118 |
| DSW068-043-08DE5 | 6.8 | ● | 8 | 43 | 53 | 91 | DSW120-056-12DE5 | 12 | ● | 12 | 56 | 71 | 118 |
| DSW069-043-08DE5 | 6.9 | ● | 8 | 43 | 53 | 91 | DSW121-060-14DE5 | 12.1 | ● | 14 | 60 | 77 | 124 |
| DSW070-043-08DE5 | 7 | ● | 8 | 43 | 53 | 91 | DSW122-060-14DE5 | 12.2 | ● | 14 | 60 | 77 | 124 |
| DSW071-043-08DE5 | 7.1 | ● | 8 | 43 | 53 | 91 | DSW123-060-14DE5 | 12.3 | ● | 14 | 60 | 77 | 124 |
| DSW072-043-08DE5 | 7.2 | ● | 8 | 43 | 53 | 91 | DSW124-060-14DE5 | 12.4 | ● | 14 | 60 | 77 | 124 |
| DSW073-043-08DE5 | 7.3 | ● | 8 | 43 | 53 | 91 | DSW125-060-14DE5 | 12.5 | ● | 14 | 60 | 77 | 124 |
| DSW074-043-08DE5 | 7.4 | ● | 8 | 43 | 53 | 91 | DSW126-060-14DE5 | 12.6 | ● | 14 | 60 | 77 | 124 |
| DSW075-043-08DE5 | 7.5 | ● | 8 | 43 | 53 | 91 | DSW127-060-14DE5 | 12.7 | ● | 14 | 60 | 77 | 124 |
| DSW076-043-08DE5 | 7.6 | ● | 8 | 43 | 53 | 91 | DSW128-060-14DE5 | 12.8 | ● | 14 | 60 | 77 | 124 |
| DSW077-043-08DE5 | 7.7 | ● | 8 | 43 | 53 | 91 | DSW129-060-14DE5 | 12.9 | ● | 14 | 60 | 77 | 124 |
| DSW078-043-08DE5 | 7.8 | ● | 8 | 43 | 53 | 91 | DSW130-060-14DE5 | 13 | ● | 14 | 60 | 77 | 124 |
| DSW079-043-08DE5 | 7.9 | ● | 8 | 43 | 53 | 91 | DSW131-060-14DE5 | 13.1 | ● | 14 | 60 | 77 | 124 |
| DSW080-043-08DE5 | 8 | ● | 8 | 43 | 53 | 91 | DSW132-060-14DE5 | 13.2 | ● | 14 | 60 | 77 | 124 |
| DSW081-049-10DE5 | 8.1 | ● | 10 | 49 | 61 | 103 | DSW133-060-14DE5 | 13.3 | ● | 14 | 60 | 77 | 124 |

● : Line-up

2-effective Drill

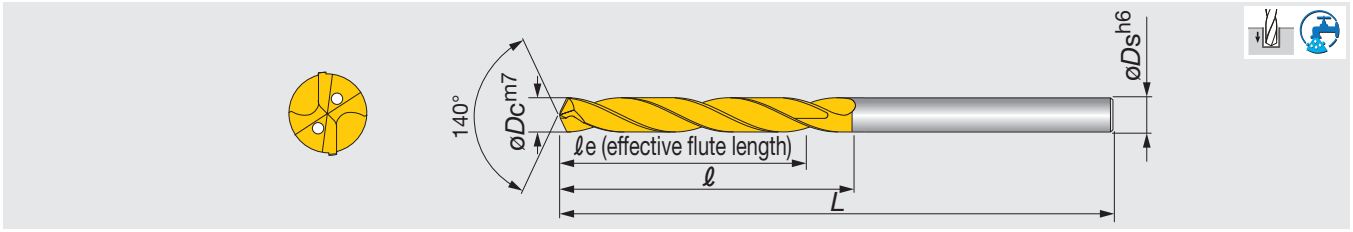
| Designation | øDc | AH725 | øDs | ℓe | ℓ | L |
|---|---|---|---|---|---|---|
| DSW134-060-14DE5 | 13.4 | ● | 14 | 60 | 77 | 124 |
| DSW135-060-14DE5 | 13.5 | ● | 14 | 60 | 77 | 124 |
| DSW136-060-14DE5 | 13.6 | ● | 14 | 60 | 77 | 124 |
| DSW137-060-14DE5 | 13.7 | ● | 14 | 60 | 77 | 124 |
| DSW138-060-14DE5 | 13.8 | ● | 14 | 60 | 77 | 124 |
| DSW139-060-14DE5 | 13.9 | ● | 14 | 60 | 77 | 124 |
| DSW140-060-14DE5 | 14 | ● | 14 | 60 | 77 | 124 |
| DSW141-063-16DE5 | 14.1 | ● | 16 | 63 | 83 | 133 |
| DSW142-063-16DE5 | 14.2 | ● | 16 | 63 | 83 | 133 |
| DSW143-063-16DE5 | 14.3 | ● | 16 | 63 | 83 | 133 |
| DSW144-063-16DE5 | 14.4 | ● | 16 | 63 | 83 | 133 |
| DSW145-063-16DE5 | 14.5 | ● | 16 | 63 | 83 | 133 |
| DSW146-063-16DE5 | 14.6 | ● | 16 | 63 | 83 | 133 |
| DSW147-063-16DE5 | 14.7 | ● | 16 | 63 | 83 | 133 |
| DSW148-063-16DE5 | 14.8 | ● | 16 | 63 | 83 | 133 |
| DSW149-063-16DE5 | 14.9 | ● | 16 | 63 | 83 | 133 |
| DSW150-063-16DE5 | 15 | ● | 16 | 63 | 83 | 133 |
| DSW151-063-16DE5 | 15.1 | ● | 16 | 63 | 83 | 133 |
| DSW152-063-16DE5 | 15.2 | ● | 16 | 63 | 83 | 133 |
| DSW153-063-16DE5 | 15.3 | ● | 16 | 63 | 83 | 133 |
| DSW154-063-16DE5 | 15.4 | ● | 16 | 63 | 83 | 133 |
| DSW155-063-16DE5 | 15.5 | ● | 16 | 63 | 83 | 133 |
| DSW156-063-16DE5 | 15.6 | ● | 16 | 63 | 83 | 133 |
| DSW157-063-16DE5 | 15.7 | ● | 16 | 63 | 83 | 133 |
| DSW158-063-16DE5 | 15.8 | ● | 16 | 63 | 83 | 133 |
| DSW159-063-16DE5 | 15.9 | ● | 16 | 63 | 83 | 133 |
| DSW160-063-16DE5 | 16 | ● | 16 | 63 | 83 | 133 |

● : Line-up

# SOLIDDRILL

## DSW-DI5

Soliddrill with 140° point angle with oil hole & DIN shank, L/D = 5, dia = ø3 - ø16 mm




| Designation | øDc | AH725 | øDs | ℓe | ℓ | L | Designation | øDc | AH725 | øDs | ℓe | ℓ | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DSW030-023-06DI5 | 3 | ● | 6 | 23 | 28 | 66 | DSW082-049-10DI5 | 8.2 | ● | 10 | 49 | 61 | 103 |
| DSW031-023-06DI5 | 3.1 | ● | 6 | 23 | 28 | 66 | DSW083-049-10DI5 | 8.3 | ● | 10 | 49 | 61 | 103 |
| DSW032-023-06DI5 | 3.2 | ● | 6 | 23 | 28 | 66 | DSW084-049-10DI5 | 8.4 | ● | 10 | 49 | 61 | 103 |
| DSW033-023-06DI5 | 3.3 | ● | 6 | 23 | 28 | 66 | DSW085-049-10DI5 | 8.5 | ● | 10 | 49 | 61 | 103 |
| DSW034-023-06DI5 | 3.4 | ● | 6 | 23 | 28 | 66 | DSW086-049-10DI5 | 8.6 | ● | 10 | 49 | 61 | 103 |
| DSW035-023-06DI5 | 3.5 | ● | 6 | 23 | 28 | 66 | DSW087-049-10DI5 | 8.7 | ● | 10 | 49 | 61 | 103 |
| DSW036-023-06DI5 | 3.6 | ● | 6 | 23 | 28 | 66 | DSW088-049-10DI5 | 8.8 | ● | 10 | 49 | 61 | 103 |
| DSW037-023-06DI5 | 3.7 | ● | 6 | 23 | 28 | 66 | DSW089-049-10DI5 | 8.9 | ● | 10 | 49 | 61 | 103 |
| DSW038-029-06DI5 | 3.8 | ● | 6 | 29 | 36 | 74 | DSW090-049-10DI5 | 9 | ● | 10 | 49 | 61 | 103 |
| DSW039-029-06DI5 | 3.9 | ● | 6 | 29 | 36 | 74 | DSW091-049-10DI5 | 9.1 | ● | 10 | 49 | 61 | 103 |
| DSW040-029-06DI5 | 4 | ● | 6 | 29 | 36 | 74 | DSW092-049-10DI5 | 9.2 | ● | 10 | 49 | 61 | 103 |
| DSW041-029-06DI5 | 4.1 | ● | 6 | 29 | 36 | 74 | DSW093-049-10DI5 | 9.3 | ● | 10 | 49 | 61 | 103 |
| DSW042-029-06DI5 | 4.2 | ● | 6 | 29 | 36 | 74 | DSW094-049-10DI5 | 9.4 | ● | 10 | 49 | 61 | 103 |
| DSW043-029-06DI5 | 4.3 | ● | 6 | 29 | 36 | 74 | DSW095-049-10DI5 | 9.5 | ● | 10 | 49 | 61 | 103 |
| DSW044-029-06DI5 | 4.4 | ● | 6 | 29 | 36 | 74 | DSW096-049-10DI5 | 9.6 | ● | 10 | 49 | 61 | 103 |
| DSW045-029-06DI5 | 4.5 | ● | 6 | 29 | 36 | 74 | DSW097-049-10DI5 | 9.7 | ● | 10 | 49 | 61 | 103 |
| DSW046-029-06DI5 | 4.6 | ● | 6 | 29 | 36 | 74 | DSW098-049-10DI5 | 9.8 | ● | 10 | 49 | 61 | 103 |
| DSW047-029-06DI5 | 4.7 | ● | 6 | 29 | 36 | 74 | DSW099-049-10DI5 | 9.9 | ● | 10 | 49 | 61 | 103 |
| DSW048-035-06DI5 | 4.8 | ● | 6 | 35 | 44 | 82 | DSW100-049-10DI5 | 10 | ● | 10 | 49 | 61 | 103 |
| DSW049-035-06DI5 | 4.9 | ● | 6 | 35 | 44 | 82 | DSW101-056-12DI5 | 10.1 | ● | 12 | 56 | 71 | 118 |
| DSW050-035-06DI5 | 5 | ● | 6 | 35 | 44 | 82 | DSW102-056-12DI5 | 10.2 | ● | 12 | 56 | 71 | 118 |
| DSW051-035-06DI5 | 5.1 | ● | 6 | 35 | 44 | 82 | DSW103-056-12DI5 | 10.3 | ● | 12 | 56 | 71 | 118 |
| DSW052-035-06DI5 | 5.2 | ● | 6 | 35 | 44 | 82 | DSW104-056-12DI5 | 10.4 | ● | 12 | 56 | 71 | 118 |
| DSW053-035-06DI5 | 5.3 | ● | 6 | 35 | 44 | 82 | DSW105-056-12DI5 | 10.5 | ● | 12 | 56 | 71 | 118 |
| DSW054-035-06DI5 | 5.4 | ● | 6 | 35 | 44 | 82 | DSW106-056-12DI5 | 10.6 | ● | 12 | 56 | 71 | 118 |
| DSW055-035-06DI5 | 5.5 | ● | 6 | 35 | 44 | 82 | DSW107-056-12DI5 | 10.7 | ● | 12 | 56 | 71 | 118 |
| DSW056-035-06DI5 | 5.6 | ● | 6 | 35 | 44 | 82 | DSW108-056-12DI5 | 10.8 | ● | 12 | 56 | 71 | 118 |
| DSW057-035-06DI5 | 5.7 | ● | 6 | 35 | 44 | 82 | DSW109-056-12DI5 | 10.9 | ● | 12 | 56 | 71 | 118 |
| DSW058-035-06DI5 | 5.8 | ● | 6 | 35 | 44 | 82 | DSW110-056-12DI5 | 11 | ● | 12 | 56 | 71 | 118 |
| DSW059-035-06DI5 | 5.9 | ● | 6 | 35 | 44 | 82 | DSW111-056-12DI5 | 11.1 | ● | 12 | 56 | 71 | 118 |
| DSW060-035-06DI5 | 6 | ● | 6 | 35 | 44 | 82 | DSW112-056-12DI5 | 11.2 | ● | 12 | 56 | 71 | 118 |
| DSW061-043-08DI5 | 6.1 | ● | 8 | 43 | 53 | 91 | DSW113-056-12DI5 | 11.3 | ● | 12 | 56 | 71 | 118 |
| DSW062-043-08DI5 | 6.2 | ● | 8 | 43 | 53 | 91 | DSW114-056-12DI5 | 11.4 | ● | 12 | 56 | 71 | 118 |
| DSW063-043-08DI5 | 6.3 | ● | 8 | 43 | 53 | 91 | DSW115-056-12DI5 | 11.5 | ● | 12 | 56 | 71 | 118 |
| DSW064-043-08DI5 | 6.4 | ● | 8 | 43 | 53 | 91 | DSW116-056-12DI5 | 11.6 | ● | 12 | 56 | 71 | 118 |
| DSW065-043-08DI5 | 6.5 | ● | 8 | 43 | 53 | 91 | DSW117-056-12DI5 | 11.7 | ● | 12 | 56 | 71 | 118 |
| DSW066-043-08DI5 | 6.6 | ● | 8 | 43 | 53 | 91 | DSW118-056-12DI5 | 11.8 | ● | 12 | 56 | 71 | 118 |
| DSW067-043-08DI5 | 6.7 | ● | 8 | 43 | 53 | 91 | DSW119-056-12DI5 | 11.9 | ● | 12 | 56 | 71 | 118 |
| DSW068-043-08DI5 | 6.8 | ● | 8 | 43 | 53 | 91 | DSW120-056-12DI5 | 12 | ● | 12 | 56 | 71 | 118 |
| DSW069-043-08DI5 | 6.9 | ● | 8 | 43 | 53 | 91 | DSW121-060-14DI5 | 12.1 | ● | 14 | 60 | 77 | 124 |
| DSW070-043-08DI5 | 7 | ● | 8 | 43 | 53 | 91 | DSW122-060-14DI5 | 12.2 | ● | 14 | 60 | 77 | 124 |
| DSW071-043-08DI5 | 7.1 | ● | 8 | 43 | 53 | 91 | DSW123-060-14DI5 | 12.3 | ● | 14 | 60 | 77 | 124 |
| DSW072-043-08DI5 | 7.2 | ● | 8 | 43 | 53 | 91 | DSW124-060-14DI5 | 12.4 | ● | 14 | 60 | 77 | 124 |
| DSW073-043-08DI5 | 7.3 | ● | 8 | 43 | 53 | 91 | DSW125-060-14DI5 | 12.5 | ● | 14 | 60 | 77 | 124 |
| DSW074-043-08DI5 | 7.4 | ● | 8 | 43 | 53 | 91 | DSW126-060-14DI5 | 12.6 | ● | 14 | 60 | 77 | 124 |
| DSW075-043-08DI5 | 7.5 | ● | 8 | 43 | 53 | 91 | DSW127-060-14DI5 | 12.7 | ● | 14 | 60 | 77 | 124 |
| DSW076-043-08DI5 | 7.6 | ● | 8 | 43 | 53 | 91 | DSW128-060-14DI5 | 12.8 | ● | 14 | 60 | 77 | 124 |
| DSW077-043-08DI5 | 7.7 | ● | 8 | 43 | 53 | 91 | DSW129-060-14DI5 | 12.9 | ● | 14 | 60 | 77 | 124 |
| DSW078-043-08DI5 | 7.8 | ● | 8 | 43 | 53 | 91 | DSW130-060-14DI5 | 13 | ● | 14 | 60 | 77 | 124 |
| DSW079-043-08DI5 | 7.9 | ● | 8 | 43 | 53 | 91 | DSW131-060-14DI5 | 13.1 | ● | 14 | 60 | 77 | 124 |
| DSW080-043-08DI5 | 8 | ● | 8 | 43 | 53 | 91 | DSW132-060-14DI5 | 13.2 | ● | 14 | 60 | 77 | 124 |
| DSW081-049-10DI5 | 8.1 | ● | 10 | 49 | 61 | 103 | DSW133-060-14DI5 | 13.3 | ● | 14 | 60 | 77 | 124 |

● : Line-up

2-effective Drill

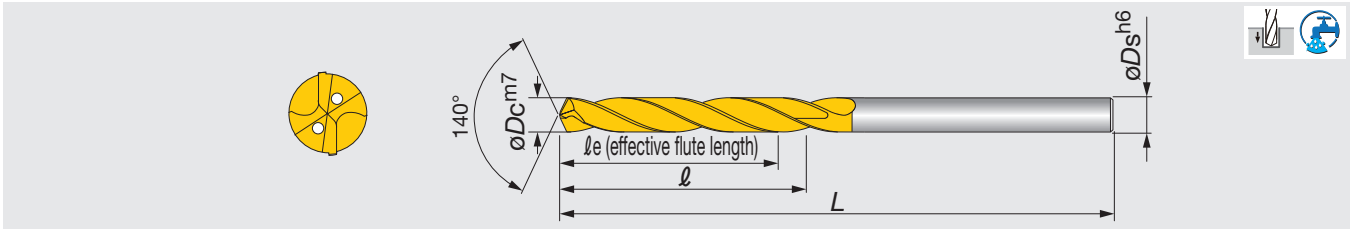
| Designation | øDc | AH725 | øDs | ℓe | ℓ | L |
|---|---|---|---|---|---|---|
| DSW134-060-14DI5 | 13.4 | ● | 14 | 60 | 77 | 124 |
| DSW135-060-14DI5 | 13.5 | ● | 14 | 60 | 77 | 124 |
| DSW136-060-14DI5 | 13.6 | ● | 14 | 60 | 77 | 124 |
| DSW137-060-14DI5 | 13.7 | ● | 14 | 60 | 77 | 124 |
| DSW138-060-14DI5 | 13.8 | ● | 14 | 60 | 77 | 124 |
| DSW139-060-14DI5 | 13.9 | ● | 14 | 60 | 77 | 124 |
| DSW140-060-14DI5 | 14 | ● | 14 | 60 | 77 | 124 |
| DSW141-063-16DI5 | 14.1 | ● | 16 | 63 | 83 | 133 |
| DSW142-063-16DI5 | 14.2 | ● | 16 | 63 | 83 | 133 |
| DSW143-063-16DI5 | 14.3 | ● | 16 | 63 | 83 | 133 |
| DSW144-063-16DI5 | 14.4 | ● | 16 | 63 | 83 | 133 |
| DSW145-063-16DI5 | 14.5 | ● | 16 | 63 | 83 | 133 |
| DSW146-063-16DI5 | 14.6 | ● | 16 | 63 | 83 | 133 |
| DSW147-063-16DI5 | 14.7 | ● | 16 | 63 | 83 | 133 |
| DSW148-063-16DI5 | 14.8 | ● | 16 | 63 | 83 | 133 |
| DSW149-063-16DI5 | 14.9 | ● | 16 | 63 | 83 | 133 |
| DSW150-063-16DI5 | 15 | ● | 16 | 63 | 83 | 133 |
| DSW151-063-16DI5 | 15.1 | ● | 16 | 63 | 83 | 133 |
| DSW152-063-16DI5 | 15.2 | ● | 16 | 63 | 83 | 133 |
| DSW153-063-16DI5 | 15.3 | ● | 16 | 63 | 83 | 133 |
| DSW154-063-16DI5 | 15.4 | ● | 16 | 63 | 83 | 133 |
| DSW155-063-16DI5 | 15.5 | ● | 16 | 63 | 83 | 133 |
| DSW156-063-16DI5 | 15.6 | ● | 16 | 63 | 83 | 133 |
| DSW157-063-16DI5 | 15.7 | ● | 16 | 63 | 83 | 133 |
| DSW158-063-16DI5 | 15.8 | ● | 16 | 63 | 83 | 133 |
| DSW159-063-16DI5 | 15.9 | ● | 16 | 63 | 83 | 133 |
| DSW160-063-16DI5 | 16 | ● | 16 | 63 | 83 | 133 |

● : Line-up

# SOLIDDRILL

## DSW-DI8

Soliddrill with 140° point angle with oil hole & DIN shank, L/D = 8, dia = ø3 - ø10 mm



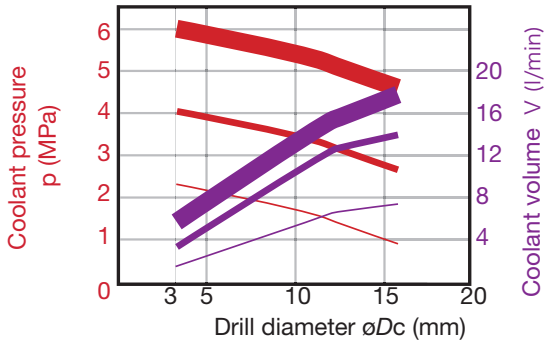

| Designation | øDc | AH725 | øDs | ℓe | ℓ | L |
|---|---|---|---|---|---|---|
| DSW030-029-06DI8 | 3 | ● | 6 | 29 | 34 | 72 |
| DSW031-029-06DI8 | 3.1 | ● | 6 | 29 | 34 | 72 |
| DSW032-029-06DI8 | 3.2 | ● | 6 | 29 | 34 | 72 |
| DSW033-029-06DI8 | 3.3 | ● | 6 | 29 | 34 | 72 |
| DSW034-029-06DI8 | 3.4 | ● | 6 | 29 | 34 | 72 |
| DSW035-029-06DI8 | 3.5 | ● | 6 | 29 | 34 | 72 |
| DSW036-029-06DI8 | 3.6 | ● | 6 | 29 | 34 | 72 |
| DSW037-029-06DI8 | 3.7 | ● | 6 | 29 | 34 | 72 |
| DSW038-036-06DI8 | 3.8 | ● | 6 | 36 | 43 | 81 |
| DSW039-036-06DI8 | 3.9 | ● | 6 | 36 | 43 | 81 |
| DSW040-036-06DI8 | 4 | ● | 6 | 36 | 43 | 81 |
| DSW041-036-06DI8 | 4.1 | ● | 6 | 36 | 43 | 81 |
| DSW042-036-06DI8 | 4.2 | ● | 6 | 36 | 43 | 81 |
| DSW043-036-06DI8 | 4.3 | ● | 6 | 36 | 43 | 81 |
| DSW044-036-06DI8 | 4.4 | ● | 6 | 36 | 43 | 81 |
| DSW045-036-06DI8 | 4.5 | ● | 6 | 36 | 43 | 81 |
| DSW046-036-06DI8 | 4.6 | ● | 6 | 36 | 43 | 81 |
| DSW047-036-06DI8 | 4.7 | ● | 6 | 36 | 43 | 81 |
| DSW048-048-06DI8 | 4.8 | ● | 6 | 48 | 57 | 95 |
| DSW049-048-06DI8 | 4.9 | ● | 6 | 48 | 57 | 95 |
| DSW050-048-06DI8 | 5 | ● | 6 | 48 | 57 | 95 |
| DSW051-048-06DI8 | 5.1 | ● | 6 | 48 | 57 | 95 |
| DSW052-048-06DI8 | 5.2 | ● | 6 | 48 | 57 | 95 |
| DSW053-048-06DI8 | 5.3 | ● | 6 | 48 | 57 | 95 |
| DSW054-048-06DI8 | 5.4 | ● | 6 | 48 | 57 | 95 |
| DSW055-048-06DI8 | 5.5 | ● | 6 | 48 | 57 | 95 |
| DSW056-048-06DI8 | 5.6 | ● | 6 | 48 | 57 | 95 |
| DSW057-048-06DI8 | 5.7 | ● | 6 | 48 | 57 | 95 |
| DSW058-048-06DI8 | 5.8 | ● | 6 | 48 | 57 | 95 |
| DSW059-048-06DI8 | 5.9 | ● | 6 | 48 | 57 | 95 |
| DSW060-048-06DI8 | 6 | ● | 6 | 48 | 57 | 95 |
| DSW061-064-08DI8 | 6.1 | ● | 8 | 64 | 76 | 114 |
| DSW062-064-08DI8 | 6.2 | ● | 8 | 64 | 76 | 114 |
| DSW063-064-08DI8 | 6.3 | ● | 8 | 64 | 76 | 114 |
| DSW064-064-08DI8 | 6.4 | ● | 8 | 64 | 76 | 114 |
| DSW065-064-08DI8 | 6.5 | ● | 8 | 64 | 76 | 114 |
| DSW066-064-08DI8 | 6.6 | ● | 8 | 64 | 76 | 114 |
| DSW067-064-08DI8 | 6.7 | ● | 8 | 64 | 76 | 114 |
| DSW068-064-08DI8 | 6.8 | ● | 8 | 64 | 76 | 114 |
| DSW069-064-08DI8 | 6.9 | ● | 8 | 64 | 76 | 114 |
| DSW070-064-08DI8 | 7 | ● | 8 | 64 | 76 | 114 |
| DSW071-064-08DI8 | 7.1 | ● | 8 | 64 | 76 | 114 |
| DSW072-064-08DI8 | 7.2 | ● | 8 | 64 | 76 | 114 |
| DSW073-064-08DI8 | 7.3 | ● | 8 | 64 | 76 | 114 |
| DSW074-064-08DI8 | 7.4 | ● | 8 | 64 | 76 | 114 |
| DSW075-064-08DI8 | 7.5 | ● | 8 | 64 | 76 | 114 |
| DSW076-064-08DI8 | 7.6 | ● | 8 | 64 | 76 | 114 |
| DSW077-064-08DI8 | 7.7 | ● | 8 | 64 | 76 | 114 |
| DSW078-064-08DI8 | 7.8 | ● | 8 | 64 | 76 | 114 |
| DSW079-064-08DI8 | 7.9 | ● | 8 | 64 | 76 | 114 |
| DSW080-064-08DI8 | 8 | ● | 8 | 64 | 76 | 114 |
| DSW081-080-10DI8 | 8.1 | ● | 10 | 80 | 95 | 142 |

| Designation | øDc | AH725 | øDs | ℓe | ℓ | L |
|---|---|---|---|---|---|---|
| DSW082-080-10DI8 | 8.2 | ● | 10 | 80 | 95 | 142 |
| DSW083-080-10DI8 | 8.3 | ● | 10 | 80 | 95 | 142 |
| DSW084-080-10DI8 | 8.4 | ● | 10 | 80 | 95 | 142 |
| DSW085-080-10DI8 | 8.5 | ● | 10 | 80 | 95 | 142 |
| DSW086-080-10DI8 | 8.6 | ● | 10 | 80 | 95 | 142 |
| DSW087-080-10DI8 | 8.7 | ● | 10 | 80 | 95 | 142 |
| DSW088-080-10DI8 | 8.8 | ● | 10 | 80 | 95 | 142 |
| DSW089-080-10DI8 | 8.9 | ● | 10 | 80 | 95 | 142 |
| DSW090-080-10DI8 | 9 | ● | 10 | 80 | 95 | 142 |
| DSW091-080-10DI8 | 9.1 | ● | 10 | 80 | 95 | 142 |
| DSW092-080-10DI8 | 9.2 | ● | 10 | 80 | 95 | 142 |
| DSW093-080-10DI8 | 9.3 | ● | 10 | 80 | 95 | 142 |
| DSW094-080-10DI8 | 9.4 | ● | 10 | 80 | 95 | 142 |
| DSW095-080-10DI8 | 9.5 | ● | 10 | 80 | 95 | 142 |
| DSW096-080-10DI8 | 9.6 | ● | 10 | 80 | 95 | 142 |
| DSW097-080-10DI8 | 9.7 | ● | 10 | 80 | 95 | 142 |
| DSW098-080-10DI8 | 9.8 | ● | 10 | 80 | 95 | 142 |
| DSW099-080-10DI8 | 9.9 | ● | 10 | 80 | 95 | 142 |
| DSW100-080-10DI8 | 10 | ● | 10 | 80 | 95 | 142 |

● : Line-up

## Recommended coolant pressure and volume for internal coolant supply:

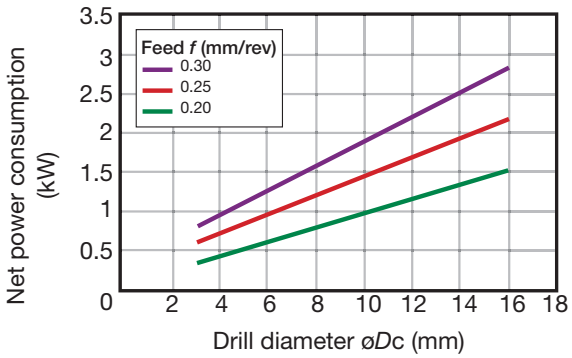
The following graph is a reference guide for pressure and volume. Values should be adjusted according to work material and actual chip evacuation.




: Ideal pressure
: Enough pressure
: Minimum pressure
: Ideal volume
: Enough volume
: Minimum volume

## Reference for required spindle power:

The required spindle power may vary depending on the type of work material or hardness. A spindle with sufficient power should be used when referring to the below graph.




Work material : Alloy steel (SNCM439)
Cutting speed : *Vc* = 100 m/min

## Designation system

**DSW** ① **088** ② - **035** ③ - **10** ④ - **D** ⑤ **E** ⑥ **3** ⑦

| ① Series | |
|---|---|
| DSW | Series name of solid drill |

| ② Drill dia. ø*Dc* (mm) | |
|---|---|
| 088 | ø8.8 |

| ③ Effective flute length ℓe (mm) | |
|---|---|
| 035 | 35 |

| ④ Shank diameter ø*Ds* (mm) | |
|---|---|
| 10 | ø10 |

| ⑤ DIN 6535 - Form HA |
|---|

| ⑥ Coolant Supply | |
|---|---|
| E | External (without coolant hole) |
| I | Internal (with coolant hole) |

| ⑦ Drilling depth |
|---|
| **Approximate value of L/D ratio.** Caution: Code may be different from the actual length. This is dependent upon the tool diameter. |

**Caution: "Effective flute length" shows the maximum flute length for effective chip evacuation. The actual drilling depth may be shorter than described depending on the work material or cutting conditions.**

# STANDARD CUTTING CONDITIONS

## DSW-DE (External supply)

| ISO | Workpiece material | Brinell hardness (HB) | Cutting speed: *Vc* (m/min) | | | Feed: *f* (mm/rev) | | |
|---|---|---|---|---|---|---|---|---|
| | | | ø3 ~ ø6 | ø6 ~ ø10 | ø10 ~ ø16 | ø3 ~ ø6 | ø6 ~ ø10 | ø10 ~ ø16 |
| P | Low carbon steels (C < 0.3)<br>C15E4, E275A, E355D, etc. | ~ 180 | 40 - 100 | 60 - 120 | 60 - 130 | 0.15 - 0.3 | 0.15 - 0.35 | 0.2 - 0.5 |
| P | Carbon steels (C > 0.3)<br>C45, C55, etc. | 180 ~ 300 | 40 - 90 | 50 - 120 | 60 - 130 | 0.15 - 0.3 | 0.15 - 0.35 | 0.2 - 0.4 |
| P | High alloy steels<br>42CrMo4, etc. | 250 ~ 350 | 40 - 80 | 50 - 100 | 50 - 100 | 0.1 - 0.2 | 0.15 - 0.3 | 0.15 - 0.35 |
| M | Stainless steels<br>X5CrNi18-9, etc. | ~ 200 | 20 - 40 | 30 - 50 | 30 - 60 | 0.05 - 0.2 | 0.1 - 0.25 | 0.1 - 0.3 |
| K | Grey cast irons<br>250, etc. | ~ 200 | 40 - 90 | 50 - 95 | 50 - 100 | 0.15 - 0.3 | 0.2 - 0.4 | 0.2 - 0.5 |
| K | Ductile cast irons<br>450-10S, etc. | ~ 300 | 30 - 80 | 40 - 90 | 45 - 90 | 0.1 - 0.3 | 0.2 - 0.4 | 0.2 - 0.4 |
| N | Aluminium alloys<br>AlSi11Cu3, etc. | - | 40 - 90 | 50 - 100 | 50 - 100 | 0.15 - 0.3 | 0.2 - 0.4 | 0.2 - 0.5 |
| S | Titanium alloys<br>Ti-6Al-4V, etc. | - | 20 - 40 | 20 - 40 | 20 - 40 | 0.1 - 0.2 | 0.15 - 0.25 | 0.15 - 0.4 |
| S | Heat-resistant alloys, Inconel<br>Inconel 718, etc. | 250 ~ | 10 - 30 | 10 - 30 | 10 - 30 | 0.03 - 0.07 | 0.05 - 0.1 | 0.07 - 0.12 |
| H | High hardened steels<br>X153CrMoV12, etc. | ~ 40HRC | 20 - 40 | 20 - 40 | 20 - 40 | 0.05 - 0.15 | 0.05 - 0.15 | 0.05 - 0.2 |

· The cutting parameters shown in the table are merely a starting guideline for general machining. Values should be varied depending on the power or rigidity of the machine to be used. Optimum conditions should be selected depending on the actual chip control or damage on edges.
· When using the smaller diameter tools in each range, set the feed "*f*" to the lower recommended values.
· The coolant supply is critical for the provision of stable machining conditions and enhanced tool life. A large coolant volume should be supplied, especially when drilling difficult-to-cut materials.
· When drilling stainless steel with low machinability such as austenitic stainless steel with a depth deeper than L/D = 3, a pecking cycle or internal coolant supply is recommended.

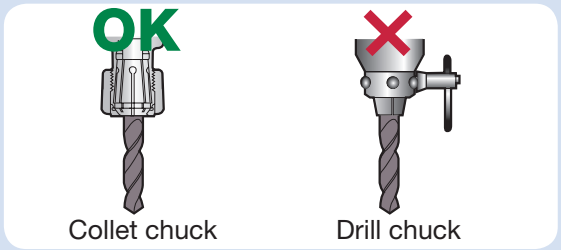
## DSW-DI (Internal supply)

| ISO | Workpiece material | Brinell hardness (HB) | Cutting speed: *Vc* (m/min) | | | Feed: *f* (mm/rev) | | |
|---|---|---|---|---|---|---|---|---|
| | | | ø3 ~ ø6 | ø6 ~ ø10 | ø10 ~ ø16 | ø3 ~ ø6 | ø6 ~ ø10 | ø10 ~ ø16 |
| P | Low carbon steels (C < 0.3)<br>C15E4, E275A, E355D, etc. | ~ 180 | 70 - 140 | 80 - 160 | 90 - 190 | 0.15 - 0.3 | 0.15 - 0.35 | 0.2 - 0.5 |
| P | Carbon steels (C > 0.3)<br>C45, C55, etc. | 180 ~ 300 | 50 - 130 | 70 - 160 | 80 - 170 | 0.15 - 0.3 | 0.15 - 0.35 | 0.2 - 0.4 |
| P | High alloy steels<br>42CrMo4, etc. | 250 ~ 350 | 40 - 100 | 60 - 140 | 60 - 160 | 0.1 - 0.2 | 0.15 - 0.3 | 0.15 - 0.35 |
| M | Stainless steels<br>X5CrNi18-9, etc. | ~ 200 | 25 - 75 | 50 - 100 | 50 - 120 | 0.05 - 0.2 | 0.1 - 0.25 | 0.1 - 0.3 |
| K | Grey cast irons<br>250, etc. | ~ 200 | 80 - 140 | 100 - 160 | 100 - 180 | 0.15 - 0.3 | 0.2 - 0.4 | 0.2 - 0.5 |
| K | Ductile cast irons<br>450-10S, etc. | ~ 300 | 70 - 140 | 80 - 150 | 80 - 170 | 0.1 - 0.3 | 0.2 - 0.4 | 0.2 - 0.45 |
| N | Aluminium alloys<br>AlSi11Cu3, etc. | - | 60 - 200 | 60 - 200 | 60 - 200 | 0.15 - 0.3 | 0.2 - 0.4 | 0.2 - 0.5 |
| S | Titanium alloys<br>Ti-6Al-4V, etc. | - | 20 - 60 | 30 - 80 | 30 - 80 | 0.1 - 0.2 | 0.1 - 0.25 | 0.15 - 0.4 |
| S | Heat-resistant alloys, Inconel<br>Inconel 718, etc. | 250 ~ | 10 - 30 | 10 - 40 | 10 - 40 | 0.03 - 0.07 | 0.05 - 0.1 | 0.07 - 0.15 |
| H | High hardened steels<br>X153CrMoV12, etc. | ~ 40HRC | 20 - 50 | 30 - 60 | 30 - 60 | 0.05 - 0.15 | 0.05 - 0.15 | 0.05 - 0.2 |

· The cutting parameters shown in the table are merely a starting guideline for general machining. Values should be varied depending on the power or rigidity of the machine to be used. Optimum conditions should be selected depending on the actual chip control or damage on edges.
· When using the smaller diameter tools in each range, set the feed "*f*" to the lower recommended values.
· Oil holes that become blocked may cause drill breakages. A filter to prevent the circulation of chips must be used on the coolant supply system.

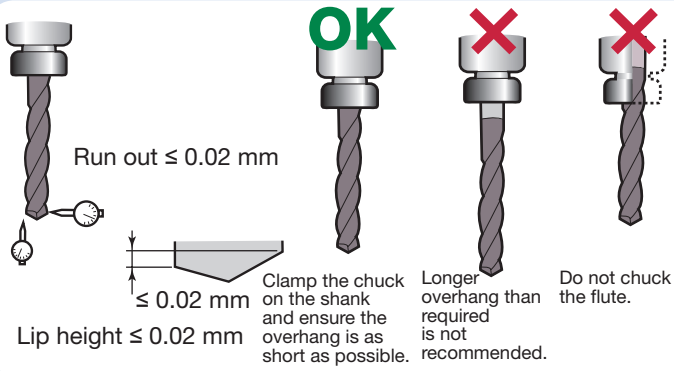
## ●Holders for solid carbide drills:

A collet chuck holder is recommended for use with carbide drills. When using a milling chuck holder, a collet chuck with a straight shank or straight collet should be used.



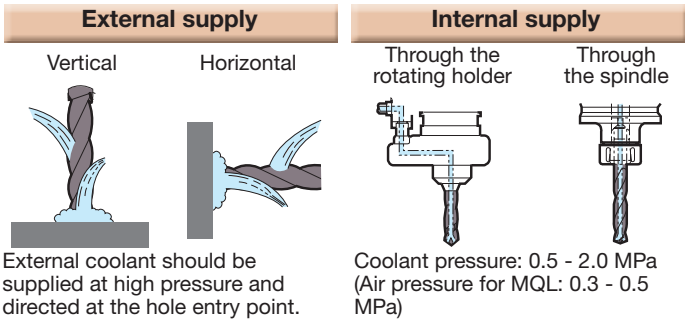

## ●Chucking drills:

- Radial run out and lip height should be less than 0.02mm. If run out or lip height is larger (close to 0.05mm), machining is possible. However, less accurate holes or short tool life may be a result.
- Overhang length should be as short as possible.



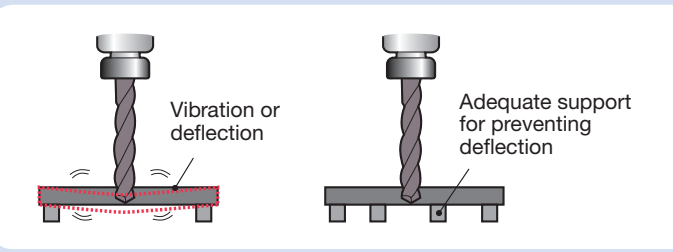

## ●Coolant Supply:

When using a drill without a coolant hole, such as the DSW-DE type, coolant should always be directed to the entrance of the hole. Maintaining this supplying is very important for stable drilling performance.



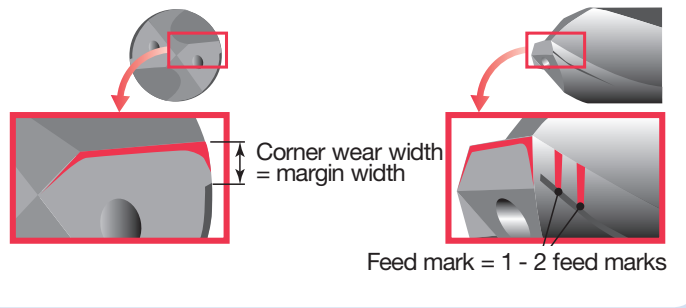

## ●Clamping workpieces:

As solid carbide drills have a higher thrust force, machining with low rigidity or inadequate support can cause fractures or breakages through vibration. It is important the workpiece is rigidly clamped and has adequate support.




## ●The criteria of tool life:

- Corner wear width: equal to margin width
- Feed mark: 1 - 2 feed marks on the margin
- Spindle load increase: 30% higher than starting level
- Irregular situation: worse chip control, hole diameter change, worse surface finish, larger burrs, bigger sound.



# Regrinding Procedures

## Regrinding method [Applied to DSW]

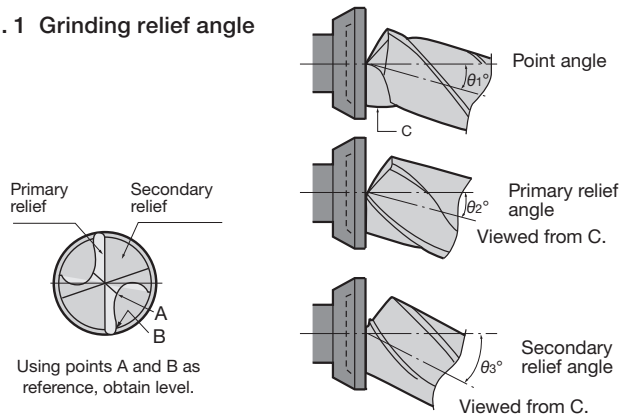
**Before regrinding**
Check the cutting edge for damage and wear. If any large fracture is found, remove with a silicon carbide wheel.

### (1) Grinding the flank

● Use a 280 to 400 grit diamond cup type wheel of 100 ~ 200 mm in diameter.

1) Grind the relief surface so that primary relief angle ($\theta$) of 2° can be formed as shown in Fig.1. After grinding the other side likewise, do sparkout grinding so that the difference of the lip height will be kept within 0.02 mm.
2) In the cases of DSW types: After grinding the primary relief angle ($\theta$) 2°, without rotating the drill, grind the secondary relief surface so that the relief angle ($\theta$) of 3° can be formed. In the same way as 2), take care to bring the ridge line formed between the primary and secondary relief surfaces to the drill center. (Values ($\theta$) of 1° ~ 3° are shown in Table 1)

Fig. 1 Grinding relief angle



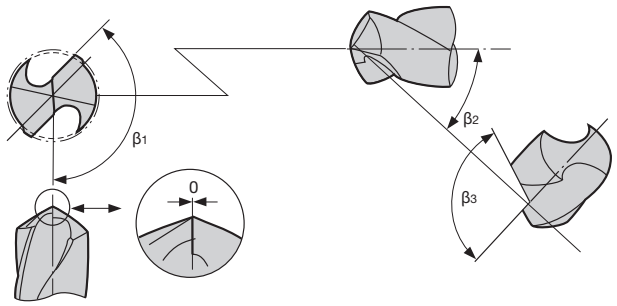

### (2) Thinning

- Use a 280 ~ 400 grit diamond straight-type wheel of 100 ~ 200 mm in diameter.
- Conduct thinning in the same manner as cross thinning (X-type).
- Values of $\beta$1 to $\beta$3 written in the figures are given in the Table 2.

| Table 1 | $\theta$1 (Point angle) | $\theta$2 (Primary relief angle) | $\theta$3 (Secondary relief angle) |
|---|---|---|---|
| **DSW** | –20° | –6° ~ –12° | –23° ~ –27° |

| Table 2 | $\beta$1 | $\beta$2 | $\beta$3 |
|---|---|---|---|
| **DSW** | 147° ~ 153° | 30° ~ 42° | 95° ~ 110° |

Fig. 2




### (3) Honing

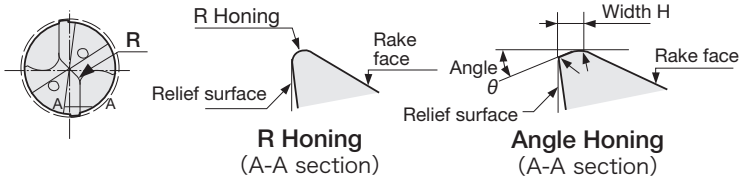
- The honing angle $\theta$ and width H should be varied depending on the drill type, diameter, and work material. Recommended honing specifications are given in the Table below.
- Honing procedures (refer to Fig.3)
  (1) Round the R portion shown in Fig.3 in large.
  (2) Then, roughly hone the cutting edge lines by using an electro-deposited diamond file of around 170 grit.
  (3) Carry out finish honing by using a diamond hand stick of 400 to 600 grit.
- The honing width should be changed depending on the drill diameter. For smaller side of diameters, the width should be in smaller side of values given in the Table.

#### • Angle honing

| | ~ ø6 mm | ø6 ~ ø10 mm | ø10 ~ ø16 mm |
|---|---|---|---|
| $\theta$ | - 20° | - 20° | - 20° |
| H | 0.03 ~ 0.05 | 0.05 ~ 0.08 | 0.08 ~ 0.1 |

#### • R Honing

| Dimensions (mm) | R Honing R (mm) |
|---|---|
| ø*D*c ≤ ø6 | 0.02 ~ 0.04 |
| ø6 < ø*D*c ≤ ø16 | 0.03 ~ 0.05 |




After regrinding, check the following before use.

- The difference of the lip height is kept within 0.02 mm.
- Any damaged portion on the cutting edges is not left.
- Cutting edges are properly honed.
- Any grinding burr is not left.

Notes:
- For more details on regrinding, consult the nearest Tungaloy sales office.

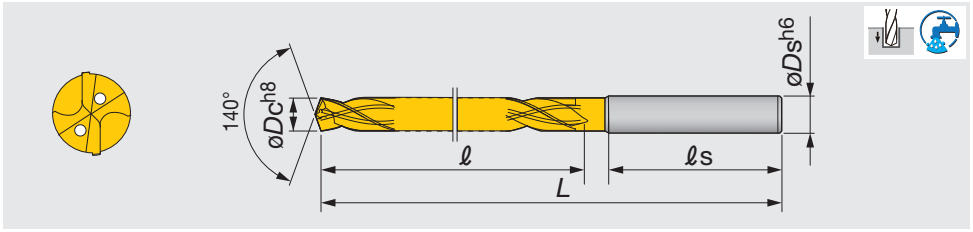
MEMO

# GIGA JETDRILL

## DSX-F03

Soliddrill with 140° point angle with oil hole & shank size to nearest mm, L/D = 3, dia = ø3 - ø20 mm






| Designation | øDc | AH180 | øDs | ℓ | ℓs | L |
|---|---|---|---|---|---|---|
| DSX0300F03 | 3 | ● | 3 | 15 | 48 | 68 |
| DSX0310F03 | 3.1 | ● | 4 | 18 | 48 | 71 |
| DSX0320F03 | 3.2 | ● | 4 | 18 | 48 | 71 |
| DSX0330F03 | 3.3 | ● | 4 | 18 | 48 | 71 |
| DSX0340F03 | 3.4 | ● | 4 | 18 | 48 | 71 |
| DSX0350F03 | 3.5 | ● | 4 | 18 | 48 | 71 |
| DSX0360F03 | 3.6 | ● | 4 | 20 | 48 | 73 |
| DSX0370F03 | 3.7 | ● | 4 | 20 | 48 | 73 |
| DSX0380F03 | 3.8 | ● | 4 | 20 | 48 | 73 |
| DSX0390F03 | 3.9 | ● | 4 | 20 | 48 | 73 |
| DSX0400F03 | 4 | ● | 4 | 20 | 48 | 73 |
| DSX0410F03 | 4.1 | ● | 5 | 23 | 50 | 78 |
| DSX0420F03 | 4.2 | ● | 5 | 23 | 50 | 78 |
| DSX0430F03 | 4.3 | ● | 5 | 23 | 50 | 78 |
| DSX0440F03 | 4.4 | ● | 5 | 23 | 50 | 78 |
| DSX0450F03 | 4.5 | ● | 5 | 23 | 50 | 78 |
| DSX0460F03 | 4.6 | ● | 5 | 25 | 50 | 80 |
| DSX0470F03 | 4.7 | ● | 5 | 25 | 50 | 80 |
| DSX0480F03 | 4.8 | ● | 5 | 25 | 50 | 80 |
| DSX0490F03 | 4.9 | ● | 5 | 25 | 50 | 80 |
| DSX0500F03 | 5 | ● | 5 | 25 | 50 | 80 |
| DSX0510F03 | 5.1 | ● | 6 | 28 | 52 | 82 |
| DSX0520F03 | 5.2 | ● | 6 | 28 | 52 | 82 |
| DSX0530F03 | 5.3 | ● | 6 | 28 | 52 | 82 |
| DSX0540F03 | 5.4 | ● | 6 | 28 | 52 | 82 |
| DSX0550F03 | 5.5 | ● | 6 | 28 | 52 | 82 |
| DSX0560F03 | 5.6 | ● | 6 | 30 | 52 | 82 |
| DSX0570F03 | 5.7 | ● | 6 | 30 | 52 | 82 |
| DSX0580F03 | 5.8 | ● | 6 | 30 | 52 | 82 |
| DSX0590F03 | 5.9 | ● | 6 | 30 | 52 | 82 |
| DSX0600F03 | 6 | ● | 6 | 30 | 52 | 82 |
| DSX0610F03 | 6.1 | ● | 7 | 33 | 53 | 86 |
| DSX0620F03 | 6.2 | ● | 7 | 33 | 53 | 86 |
| DSX0630F03 | 6.3 | ● | 7 | 33 | 53 | 86 |
| DSX0640F03 | 6.4 | ● | 7 | 33 | 53 | 86 |
| DSX0650F03 | 6.5 | ● | 7 | 33 | 53 | 86 |
| DSX0660F03 | 6.6 | ● | 7 | 35 | 53 | 88 |
| DSX0670F03 | 6.7 | ● | 7 | 35 | 53 | 88 |
| DSX0680F03 | 6.8 | ● | 7 | 35 | 53 | 88 |
| DSX0690F03 | 6.9 | ● | 7 | 35 | 53 | 88 |
| DSX0700F03 | 7 | ● | 7 | 35 | 53 | 88 |
| DSX0710F03 | 7.1 | ● | 8 | 38 | 54 | 92 |
| DSX0720F03 | 7.2 | ● | 8 | 38 | 54 | 92 |
| DSX0730F03 | 7.3 | ● | 8 | 38 | 54 | 92 |
| DSX0740F03 | 7.4 | ● | 8 | 38 | 54 | 92 |
| DSX0750F03 | 7.5 | ● | 8 | 38 | 54 | 92 |
| DSX0760F03 | 7.6 | ● | 8 | 40 | 54 | 94 |
| DSX0770F03 | 7.7 | ● | 8 | 40 | 54 | 94 |
| DSX0780F03 | 7.8 | ● | 8 | 40 | 54 | 94 |
| DSX0790F03 | 7.9 | ● | 8 | 40 | 54 | 94 |
| DSX0800F03 | 8 | ● | 8 | 40 | 54 | 94 |
| DSX0810F03 | 8.1 | ● | 9 | 43 | 55 | 100 |
| DSX0820F03 | 8.2 | ● | 9 | 43 | 55 | 100 |
| DSX0830F03 | 8.3 | ● | 9 | 43 | 55 | 100 |
| DSX0840F03 | 8.4 | ● | 9 | 43 | 55 | 100 |
| DSX0850F03 | 8.5 | ● | 9 | 43 | 55 | 100 |
| DSX0860F03 | 8.6 | ● | 9 | 45 | 55 | 100 |
| DSX0870F03 | 8.7 | ● | 9 | 45 | 55 | 100 |
| DSX0880F03 | 8.8 | ● | 9 | 45 | 55 | 100 |
| DSX0890F03 | 8.9 | ● | 9 | 45 | 55 | 100 |
| DSX0900F03 | 9 | ● | 9 | 45 | 55 | 100 |
| DSX0910F03 | 9.1 | ● | 10 | 48 | 56 | 106 |
| DSX0920F03 | 9.2 | ● | 10 | 48 | 56 | 106 |

| Designation | øDc | AH180 | øDs | ℓ | ℓs | L |
|---|---|---|---|---|---|---|
| DSX0930F03 | 9.3 | ● | 10 | 48 | 56 | 106 |
| DSX0940F03 | 9.4 | ● | 10 | 48 | 56 | 106 |
| DSX0950F03 | 9.5 | ● | 10 | 48 | 56 | 106 |
| DSX0960F03 | 9.6 | ● | 10 | 50 | 56 | 106 |
| DSX0970F03 | 9.7 | ● | 10 | 50 | 56 | 106 |
| DSX0980F03 | 9.8 | ● | 10 | 50 | 56 | 106 |
| DSX0990F03 | 9.9 | ● | 10 | 50 | 56 | 106 |
| DSX1000F03 | 10 | ● | 10 | 50 | 56 | 106 |
| DSX1010F03 | 10.1 | ● | 11 | 53 | 61 | 116 |
| DSX1020F03 | 10.2 | ● | 11 | 53 | 61 | 116 |
| DSX1030F03 | 10.3 | ● | 11 | 53 | 61 | 116 |
| DSX1040F03 | 10.4 | ● | 11 | 53 | 61 | 116 |
| DSX1050F03 | 10.5 | ● | 11 | 53 | 61 | 116 |
| DSX1060F03 | 10.6 | ● | 11 | 55 | 61 | 116 |
| DSX1070F03 | 10.7 | ● | 11 | 55 | 61 | 116 |
| DSX1080F03 | 10.8 | ● | 11 | 55 | 61 | 116 |
| DSX1090F03 | 10.9 | ● | 11 | 55 | 61 | 116 |
| DSX1100F03 | 11 | ● | 11 | 55 | 61 | 116 |
| DSX1110F03 | 11.1 | ● | 12 | 58 | 62 | 122 |
| DSX1120F03 | 11.2 | ● | 12 | 58 | 62 | 122 |
| DSX1130F03 | 11.3 | ● | 12 | 58 | 62 | 122 |
| DSX1140F03 | 11.4 | ● | 12 | 58 | 62 | 122 |
| DSX1150F03 | 11.5 | ● | 12 | 58 | 62 | 122 |
| DSX1160F03 | 11.6 | ● | 12 | 60 | 62 | 122 |
| DSX1170F03 | 11.7 | ● | 12 | 60 | 62 | 122 |
| DSX1180F03 | 11.8 | ● | 12 | 60 | 62 | 122 |
| DSX1190F03 | 11.9 | ● | 12 | 60 | 62 | 122 |
| DSX1200F03 | 12 | ● | 12 | 60 | 62 | 122 |
| DSX1210F03 | 12.1 | ● | 13 | 65 | 63 | 128 |
| DSX1220F03 | 12.2 | ● | 13 | 65 | 63 | 128 |
| DSX1230F03 | 12.3 | ● | 13 | 65 | 63 | 128 |
| DSX1240F03 | 12.4 | ● | 13 | 65 | 63 | 128 |
| DSX1250F03 | 12.5 | ● | 13 | 65 | 63 | 128 |
| DSX1260F03 | 12.6 | ● | 13 | 65 | 63 | 128 |
| DSX1270F03 | 12.7 | ● | 13 | 65 | 63 | 128 |
| DSX1280F03 | 12.8 | ● | 13 | 65 | 63 | 128 |
| DSX1290F03 | 12.9 | ● | 13 | 65 | 63 | 128 |
| DSX1300F03 | 13 | ● | 13 | 65 | 63 | 128 |
| DSX1310F03 | 13.1 | ● | 14 | 70 | 64 | 134 |
| DSX1320F03 | 13.2 | ● | 14 | 70 | 64 | 134 |
| DSX1330F03 | 13.3 | ● | 14 | 70 | 64 | 134 |
| DSX1340F03 | 13.4 | ● | 14 | 70 | 64 | 134 |
| DSX1350F03 | 13.5 | ● | 14 | 70 | 64 | 134 |
| DSX1360F03 | 13.6 | ● | 14 | 70 | 64 | 134 |
| DSX1370F03 | 13.7 | ● | 14 | 70 | 64 | 134 |
| DSX1380F03 | 13.8 | ● | 14 | 70 | 64 | 134 |
| DSX1390F03 | 13.9 | ● | 14 | 70 | 64 | 134 |
| DSX1400F03 | 14 | ● | 14 | 70 | 64 | 134 |
| DSX1410F03 | 14.1 | ● | 15 | 75 | 65 | 140 |
| DSX1420F03 | 14.2 | ● | 15 | 75 | 65 | 140 |
| DSX1430F03 | 14.3 | ● | 15 | 75 | 65 | 140 |
| DSX1440F03 | 14.4 | ● | 15 | 75 | 65 | 140 |
| DSX1450F03 | 14.5 | ● | 15 | 75 | 65 | 140 |
| DSX1460F03 | 14.6 | ● | 15 | 75 | 65 | 140 |
| DSX1470F03 | 14.7 | ● | 15 | 75 | 65 | 140 |
| DSX1480F03 | 14.8 | ● | 15 | 75 | 65 | 140 |
| DSX1490F03 | 14.9 | ● | 15 | 75 | 65 | 140 |
| DSX1500F03 | 15 | ● | 15 | 75 | 65 | 140 |
| DSX1510F03 | 15.1 | ● | 16 | 80 | 66 | 146 |
| DSX1520F03 | 15.2 | ● | 16 | 80 | 66 | 146 |
| DSX1530F03 | 15.3 | ● | 16 | 80 | 66 | 146 |
| DSX1540F03 | 15.4 | ● | 16 | 80 | 66 | 146 |
| DSX1550F03 | 15.5 | ● | 16 | 80 | 66 | 146 |

● : Line-up

| Designation | øDc | AH180 | øDs | ℓ | ℓs | L |
|---|---|---|---|---|---|---|
| DSX1560F03 | 15.6 | ● | 16 | 80 | 66 | 146 |
| DSX1570F03 | 15.7 | ● | 16 | 80 | 66 | 146 |
| DSX1580F03 | 15.8 | ● | 16 | 80 | 66 | 146 |
| DSX1590F03 | 15.9 | ● | 16 | 80 | 66 | 146 |
| DSX1600F03 | 16 | ● | 16 | 80 | 66 | 146 |
| DSX1650F03 | 16.5 | ● | 17 | 85 | 67 | 152 |
| DSX1700F03 | 17 | ● | 17 | 85 | 67 | 152 |
| DSX1750F03 | 17.5 | ● | 18 | 90 | 68 | 158 |
| DSX1800F03 | 18 | ● | 18 | 90 | 68 | 158 |
| DSX1850F03 | 18.5 | ● | 19 | 95 | 69 | 164 |
| DSX1900F03 | 19 | ● | 19 | 95 | 69 | 164 |
| DSX1950F03 | 19.5 | ● | 20 | 100 | 70 | 170 |
| DSX2000F03 | 20 | ● | 20 | 100 | 70 | 170 |

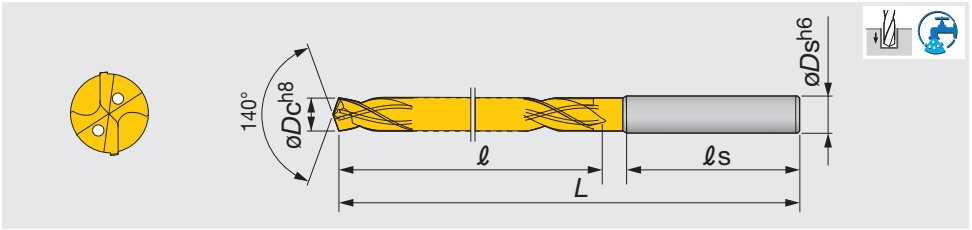
● : Line-up

# GIGA JETDRILL

## DSX-F05

Soliddrill with 140° point angle with oil hole & shank size to nearest mm, L/D = 5, dia = ø3 - ø20 mm






| Designation | øDc | AH180 | øDs | ℓ | ℓs | L |
|---|---|---|---|---|---|---|
| DSX0300F05 | 3 | ● | 3 | 24 | 48 | 77 |
| DSX0310F05 | 3.1 | ● | 4 | 28 | 48 | 81 |
| DSX0320F05 | 3.2 | ● | 4 | 28 | 48 | 81 |
| DSX0330F05 | 3.3 | ● | 4 | 28 | 48 | 81 |
| DSX0340F05 | 3.4 | ● | 4 | 28 | 48 | 81 |
| DSX0350F05 | 3.5 | ● | 4 | 28 | 48 | 81 |
| DSX0360F05 | 3.6 | ● | 4 | 32 | 48 | 85 |
| DSX0370F05 | 3.7 | ● | 4 | 32 | 48 | 85 |
| DSX0380F05 | 3.8 | ● | 4 | 32 | 48 | 85 |
| DSX0390F05 | 3.9 | ● | 4 | 32 | 48 | 85 |
| DSX0400F05 | 4 | ● | 4 | 32 | 48 | 85 |
| DSX0410F05 | 4.1 | ● | 5 | 36 | 50 | 91 |
| DSX0420F05 | 4.2 | ● | 5 | 36 | 50 | 91 |
| DSX0430F05 | 4.3 | ● | 5 | 36 | 50 | 91 |
| DSX0440F05 | 4.4 | ● | 5 | 36 | 50 | 91 |
| DSX0450F05 | 4.5 | ● | 5 | 36 | 50 | 91 |
| DSX0460F05 | 4.6 | ● | 5 | 40 | 50 | 94 |
| DSX0470F05 | 4.7 | ● | 5 | 40 | 50 | 94 |
| DSX0480F05 | 4.8 | ● | 5 | 40 | 50 | 94 |
| DSX0490F05 | 4.9 | ● | 5 | 40 | 50 | 94 |
| DSX0500F05 | 5 | ● | 5 | 40 | 50 | 94 |
| DSX0510F05 | 5.1 | ● | 6 | 44 | 52 | 96 |
| DSX0520F05 | 5.2 | ● | 6 | 44 | 52 | 96 |
| DSX0530F05 | 5.3 | ● | 6 | 44 | 52 | 96 |
| DSX0540F05 | 5.4 | ● | 6 | 44 | 52 | 96 |
| DSX0550F05 | 5.5 | ● | 6 | 44 | 52 | 96 |
| DSX0560F05 | 5.6 | ● | 6 | 48 | 52 | 100 |
| DSX0570F05 | 5.7 | ● | 6 | 48 | 52 | 100 |
| DSX0580F05 | 5.8 | ● | 6 | 48 | 52 | 100 |
| DSX0590F05 | 5.9 | ● | 6 | 48 | 52 | 100 |
| DSX0600F05 | 6 | ● | 6 | 48 | 52 | 100 |
| DSX0610F05 | 6.1 | ● | 7 | 52 | 53 | 105 |
| DSX0620F05 | 6.2 | ● | 7 | 52 | 53 | 105 |
| DSX0630F05 | 6.3 | ● | 7 | 52 | 53 | 105 |
| DSX0640F05 | 6.4 | ● | 7 | 52 | 53 | 105 |
| DSX0650F05 | 6.5 | ● | 7 | 52 | 53 | 105 |
| DSX0660F05 | 6.6 | ● | 7 | 56 | 53 | 109 |
| DSX0670F05 | 6.7 | ● | 7 | 56 | 53 | 109 |
| DSX0680F05 | 6.8 | ● | 7 | 56 | 53 | 109 |
| DSX0690F05 | 6.9 | ● | 7 | 56 | 53 | 109 |
| DSX0700F05 | 7 | ● | 7 | 56 | 53 | 109 |
| DSX0710F05 | 7.1 | ● | 8 | 60 | 54 | 114 |
| DSX0720F05 | 7.2 | ● | 8 | 60 | 54 | 114 |
| DSX0730F05 | 7.3 | ● | 8 | 60 | 54 | 114 |
| DSX0740F05 | 7.4 | ● | 8 | 60 | 54 | 114 |
| DSX0750F05 | 7.5 | ● | 8 | 60 | 54 | 114 |
| DSX0760F05 | 7.6 | ● | 8 | 64 | 54 | 118 |
| DSX0770F05 | 7.7 | ● | 8 | 64 | 54 | 118 |
| DSX0780F05 | 7.8 | ● | 8 | 64 | 54 | 118 |
| DSX0790F05 | 7.9 | ● | 8 | 64 | 54 | 118 |
| DSX0800F05 | 8 | ● | 8 | 64 | 54 | 118 |
| DSX0810F05 | 8.1 | ● | 9 | 68 | 55 | 127 |
| DSX0820F05 | 8.2 | ● | 9 | 68 | 55 | 127 |
| DSX0830F05 | 8.3 | ● | 9 | 68 | 55 | 127 |
| DSX0840F05 | 8.4 | ● | 9 | 68 | 55 | 127 |
| DSX0850F05 | 8.5 | ● | 9 | 68 | 55 | 127 |
| DSX0860F05 | 8.6 | ● | 9 | 72 | 55 | 127 |
| DSX0870F05 | 8.7 | ● | 9 | 72 | 55 | 127 |
| DSX0880F05 | 8.8 | ● | 9 | 72 | 55 | 127 |
| DSX0890F05 | 8.9 | ● | 9 | 72 | 55 | 127 |
| DSX0900F05 | 9 | ● | 9 | 72 | 55 | 127 |
| DSX0910F05 | 9.1 | ● | 10 | 76 | 56 | 136 |
| DSX0920F05 | 9.2 | ● | 10 | 76 | 56 | 136 |

| Designation | øDc | AH180 | øDs | ℓ | ℓs | L |
|---|---|---|---|---|---|---|
| DSX0930F05 | 9.3 | ● | 10 | 76 | 56 | 136 |
| DSX0940F05 | 9.4 | ● | 10 | 76 | 56 | 136 |
| DSX0950F05 | 9.5 | ● | 10 | 76 | 56 | 136 |
| DSX0960F05 | 9.6 | ● | 10 | 80 | 56 | 136 |
| DSX0970F05 | 9.7 | ● | 10 | 80 | 56 | 136 |
| DSX0980F05 | 9.8 | ● | 10 | 80 | 56 | 136 |
| DSX0990F05 | 9.9 | ● | 10 | 80 | 56 | 136 |
| DSX1000F05 | 10 | ● | 10 | 80 | 56 | 136 |
| DSX1010F05 | 10.1 | ● | 11 | 84 | 61 | 149 |
| DSX1020F05 | 10.2 | ● | 11 | 84 | 61 | 149 |
| DSX1030F05 | 10.3 | ● | 11 | 84 | 61 | 149 |
| DSX1040F05 | 10.4 | ● | 11 | 84 | 61 | 149 |
| DSX1050F05 | 10.5 | ● | 11 | 84 | 61 | 149 |
| DSX1060F05 | 10.6 | ● | 11 | 88 | 61 | 149 |
| DSX1070F05 | 10.7 | ● | 11 | 88 | 61 | 149 |
| DSX1080F05 | 10.8 | ● | 11 | 88 | 61 | 149 |
| DSX1090F05 | 10.9 | ● | 11 | 88 | 61 | 149 |
| DSX1100F05 | 11 | ● | 11 | 88 | 61 | 149 |
| DSX1110F05 | 11.1 | ● | 12 | 92 | 62 | 158 |
| DSX1120F05 | 11.2 | ● | 12 | 92 | 62 | 158 |
| DSX1130F05 | 11.3 | ● | 12 | 92 | 62 | 158 |
| DSX1140F05 | 11.4 | ● | 12 | 92 | 62 | 158 |
| DSX1150F05 | 11.5 | ● | 12 | 92 | 62 | 158 |
| DSX1160F05 | 11.6 | ● | 12 | 96 | 62 | 158 |
| DSX1170F05 | 11.7 | ● | 12 | 96 | 62 | 158 |
| DSX1180F05 | 11.8 | ● | 12 | 96 | 62 | 158 |
| DSX1190F05 | 11.9 | ● | 12 | 96 | 62 | 158 |
| DSX1200F05 | 12 | ● | 12 | 96 | 62 | 158 |
| DSX1210F05 | 12.1 | ● | 13 | 104 | 63 | 167 |
| DSX1220F05 | 12.2 | ● | 13 | 104 | 63 | 167 |
| DSX1230F05 | 12.3 | ● | 13 | 104 | 63 | 167 |
| DSX1240F05 | 12.4 | ● | 13 | 104 | 63 | 167 |
| DSX1250F05 | 12.5 | ● | 13 | 104 | 63 | 167 |
| DSX1260F05 | 12.6 | ● | 13 | 104 | 63 | 167 |
| DSX1270F05 | 12.7 | ● | 13 | 104 | 63 | 167 |
| DSX1280F05 | 12.8 | ● | 13 | 104 | 63 | 167 |
| DSX1290F05 | 12.9 | ● | 13 | 104 | 63 | 167 |
| DSX1300F05 | 13 | ● | 13 | 104 | 63 | 167 |
| DSX1310F05 | 13.1 | ● | 14 | 112 | 64 | 176 |
| DSX1320F05 | 13.2 | ● | 14 | 112 | 64 | 176 |
| DSX1330F05 | 13.3 | ● | 14 | 112 | 64 | 176 |
| DSX1340F05 | 13.4 | ● | 14 | 112 | 64 | 176 |
| DSX1350F05 | 13.5 | ● | 14 | 112 | 64 | 176 |
| DSX1360F05 | 13.6 | ● | 14 | 112 | 64 | 176 |
| DSX1370F05 | 13.7 | ● | 14 | 112 | 64 | 176 |
| DSX1380F05 | 13.8 | ● | 14 | 112 | 64 | 176 |
| DSX1390F05 | 13.9 | ● | 14 | 112 | 64 | 176 |
| DSX1400F05 | 14 | ● | 14 | 112 | 64 | 176 |
| DSX1410F05 | 14.1 | ● | 15 | 120 | 65 | 185 |
| DSX1420F05 | 14.2 | ● | 15 | 120 | 65 | 185 |
| DSX1430F05 | 14.3 | ● | 15 | 120 | 65 | 185 |
| DSX1440F05 | 14.4 | ● | 15 | 120 | 65 | 185 |
| DSX1450F05 | 14.5 | ● | 15 | 120 | 65 | 185 |
| DSX1460F05 | 14.6 | ● | 15 | 120 | 65 | 185 |
| DSX1470F05 | 14.7 | ● | 15 | 120 | 65 | 185 |
| DSX1480F05 | 14.8 | ● | 15 | 120 | 65 | 185 |
| DSX1490F05 | 14.9 | ● | 15 | 120 | 65 | 185 |
| DSX1500F05 | 15 | ● | 15 | 120 | 65 | 185 |
| DSX1510F05 | 15.1 | ● | 16 | 128 | 66 | 194 |
| DSX1520F05 | 15.2 | ● | 16 | 128 | 66 | 194 |
| DSX1530F05 | 15.3 | ● | 16 | 128 | 66 | 194 |
| DSX1540F05 | 15.4 | ● | 16 | 128 | 66 | 194 |
| DSX1550F05 | 15.5 | ● | 16 | 128 | 66 | 194 |

● : Line-up

| Designation | ø$D_C$ | AH180 | ø$D_S$ | $\ell$ | $\ell_S$ | $L$ |
|---|---|---|---|---|---|---|
| DSX1560F05 | 15.6 | ● | 16 | 128 | 66 | 194 |
| DSX1570F05 | 15.7 | ● | 16 | 128 | 66 | 194 |
| DSX1580F05 | 15.8 | ● | 16 | 128 | 66 | 194 |
| DSX1590F05 | 15.9 | ● | 16 | 128 | 66 | 194 |
| DSX1600F05 | 16 | ● | 16 | 128 | 66 | 194 |
| DSX1650F05 | 16.5 | ● | 17 | 136 | 67 | 203 |
| DSX1700F05 | 17 | ● | 17 | 136 | 67 | 203 |
| DSX1750F05 | 17.5 | ● | 18 | 144 | 68 | 212 |
| DSX1800F05 | 18 | ● | 18 | 144 | 68 | 212 |
| DSX1850F05 | 18.5 | ● | 19 | 152 | 69 | 221 |
| DSX1900F05 | 19 | ● | 19 | 152 | 69 | 221 |
| DSX1950F05 | 19.5 | ● | 20 | 160 | 70 | 230 |
| DSX2000F05 | 20 | ● | 20 | 160 | 70 | 230 |

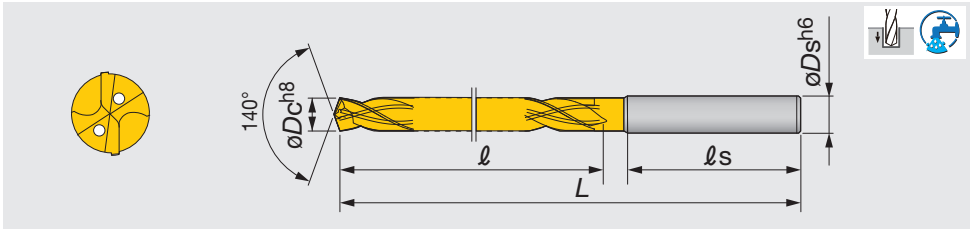
● : Line-up

# GIGA JETDRILL

## DSX-F08

Soliddrill with 140° point angle with oil hole & shank size to nearest mm, L/D = 8, dia = ø3 - ø16 mm






| Designation | øDc | AH180 | øDs | ℓ | ℓs | L |
|---|---|---|---|---|---|---|
| DSX0300F08 | 3 | ● | 3 | 33 | 48 | 86 |
| DSX0310F08 | 3.1 | | 4 | 39 | 48 | 92 |
| DSX0320F08 | 3.2 | | 4 | 39 | 48 | 92 |
| DSX0330F08 | 3.3 | | 4 | 39 | 48 | 92 |
| DSX0340F08 | 3.4 | | 4 | 39 | 48 | 92 |
| DSX0350F08 | 3.5 | ● | 4 | 39 | 48 | 92 |
| DSX0360F08 | 3.6 | | 4 | 44 | 48 | 97 |
| DSX0370F08 | 3.7 | | 4 | 44 | 48 | 97 |
| DSX0380F08 | 3.8 | | 4 | 44 | 48 | 97 |
| DSX0390F08 | 3.9 | | 4 | 44 | 48 | 97 |
| DSX0400F08 | 4 | ● | 4 | 44 | 48 | 97 |
| DSX0410F08 | 4.1 | | 5 | 50 | 50 | 105 |
| DSX0420F08 | 4.2 | | 5 | 50 | 50 | 105 |
| DSX0430F08 | 4.3 | | 5 | 50 | 50 | 105 |
| DSX0440F08 | 4.4 | | 5 | 50 | 50 | 105 |
| DSX0450F08 | 4.5 | ● | 5 | 50 | 50 | 105 |
| DSX0460F08 | 4.6 | | 5 | 55 | 50 | 110 |
| DSX0470F08 | 4.7 | | 5 | 55 | 50 | 110 |
| DSX0480F08 | 4.8 | | 5 | 55 | 50 | 110 |
| DSX0490F08 | 4.9 | | 5 | 55 | 50 | 110 |
| DSX0500F08 | 5 | ● | 5 | 55 | 50 | 110 |
| DSX0510F08 | 5.1 | ● | 6 | 61 | 52 | 113 |
| DSX0520F08 | 5.2 | | 6 | 61 | 52 | 113 |
| DSX0530F08 | 5.3 | | 6 | 61 | 52 | 113 |
| DSX0540F08 | 5.4 | | 6 | 61 | 52 | 113 |
| DSX0550F08 | 5.5 | ● | 6 | 61 | 52 | 113 |
| DSX0560F08 | 5.6 | | 6 | 66 | 52 | 118 |
| DSX0570F08 | 5.7 | | 6 | 66 | 52 | 118 |
| DSX0580F08 | 5.8 | | 6 | 66 | 52 | 118 |
| DSX0590F08 | 5.9 | | 6 | 66 | 52 | 118 |
| DSX0600F08 | 6 | ● | 6 | 66 | 52 | 118 |
| DSX0610F08 | 6.1 | | 7 | 72 | 53 | 125 |
| DSX0620F08 | 6.2 | | 7 | 72 | 53 | 125 |
| DSX0630F08 | 6.3 | | 7 | 72 | 53 | 125 |
| DSX0640F08 | 6.4 | | 7 | 72 | 53 | 125 |
| DSX0650F08 | 6.5 | ● | 7 | 72 | 53 | 125 |
| DSX0660F08 | 6.6 | | 7 | 77 | 53 | 130 |
| DSX0670F08 | 6.7 | | 7 | 77 | 53 | 130 |
| DSX0680F08 | 6.8 | | 7 | 77 | 53 | 130 |
| DSX0690F08 | 6.9 | | 7 | 77 | 53 | 130 |
| DSX0700F08 | 7 | ● | 7 | 77 | 53 | 130 |
| DSX0710F08 | 7.1 | | 8 | 83 | 54 | 137 |
| DSX0720F08 | 7.2 | | 8 | 83 | 54 | 137 |
| DSX0730F08 | 7.3 | | 8 | 83 | 54 | 137 |
| DSX0740F08 | 7.4 | | 8 | 83 | 54 | 137 |
| DSX0750F08 | 7.5 | ● | 8 | 83 | 54 | 137 |
| DSX0760F08 | 7.6 | | 8 | 88 | 54 | 142 |
| DSX0770F08 | 7.7 | | 8 | 88 | 54 | 142 |
| DSX0780F08 | 7.8 | | 8 | 88 | 54 | 142 |
| DSX0790F08 | 7.9 | | 8 | 88 | 54 | 142 |
| DSX0800F08 | 8 | ● | 8 | 88 | 54 | 142 |
| DSX0810F08 | 8.1 | | 9 | 94 | 55 | 154 |
| DSX0820F08 | 8.2 | | 9 | 94 | 55 | 154 |
| DSX0830F08 | 8.3 | ● | 9 | 94 | 55 | 154 |
| DSX0840F08 | 8.4 | | 9 | 94 | 55 | 154 |
| DSX0850F08 | 8.5 | ● | 9 | 94 | 55 | 154 |
| DSX0860F08 | 8.6 | | 9 | 99 | 55 | 154 |
| DSX0870F08 | 8.7 | | 9 | 99 | 55 | 154 |
| DSX0880F08 | 8.8 | | 9 | 99 | 55 | 154 |
| DSX0890F08 | 8.9 | | 9 | 99 | 55 | 154 |
| DSX0900F08 | 9 | ● | 9 | 99 | 55 | 154 |
| DSX0910F08 | 9.1 | | 10 | 105 | 56 | 166 |
| DSX0920F08 | 9.2 | | 10 | 105 | 56 | 166 |

| Designation | øDc | AH180 | øDs | ℓ | ℓs | L |
|---|---|---|---|---|---|---|
| DSX0930F08 | 9.3 | | 10 | 105 | 56 | 166 |
| DSX0940F08 | 9.4 | | 10 | 105 | 56 | 166 |
| DSX0950F08 | 9.5 | ● | 10 | 105 | 56 | 166 |
| DSX0960F08 | 9.6 | | 10 | 110 | 56 | 166 |
| DSX0970F08 | 9.7 | | 10 | 110 | 56 | 166 |
| DSX0980F08 | 9.8 | | 10 | 110 | 56 | 166 |
| DSX0990F08 | 9.9 | | 10 | 110 | 56 | 166 |
| DSX1000F08 | 10 | ● | 10 | 110 | 56 | 166 |
| DSX1010F08 | 10.1 | | 11 | 116 | 61 | 182 |
| DSX1020F08 | 10.2 | | 11 | 116 | 61 | 182 |
| DSX1030F08 | 10.3 | | 11 | 116 | 61 | 182 |
| DSX1040F08 | 10.4 | | 11 | 116 | 61 | 182 |
| DSX1050F08 | 10.5 | ● | 11 | 116 | 61 | 182 |
| DSX1060F08 | 10.6 | | 11 | 121 | 61 | 182 |
| DSX1070F08 | 10.7 | | 11 | 121 | 61 | 182 |
| DSX1080F08 | 10.8 | | 11 | 121 | 61 | 182 |
| DSX1090F08 | 10.9 | | 11 | 121 | 61 | 182 |
| DSX1100F08 | 11 | ● | 11 | 121 | 61 | 182 |
| DSX1110F08 | 11.1 | | 12 | 127 | 62 | 194 |
| DSX1120F08 | 11.2 | | 12 | 127 | 62 | 194 |
| DSX1130F08 | 11.3 | | 12 | 127 | 62 | 194 |
| DSX1140F08 | 11.4 | | 12 | 127 | 62 | 194 |
| DSX1150F08 | 11.5 | ● | 12 | 127 | 62 | 194 |
| DSX1160F08 | 11.6 | | 12 | 132 | 62 | 194 |
| DSX1170F08 | 11.7 | | 12 | 132 | 62 | 194 |
| DSX1180F08 | 11.8 | | 12 | 132 | 62 | 194 |
| DSX1190F08 | 11.9 | | 12 | 132 | 62 | 194 |
| DSX1200F08 | 12 | ● | 12 | 132 | 62 | 194 |
| DSX1210F08 | 12.1 | | 13 | 143 | 63 | 206 |
| DSX1220F08 | 12.2 | | 13 | 143 | 63 | 206 |
| DSX1230F08 | 12.3 | | 13 | 143 | 63 | 206 |
| DSX1240F08 | 12.4 | | 13 | 143 | 63 | 206 |
| DSX1250F08 | 12.5 | ● | 13 | 143 | 63 | 206 |
| DSX1260F08 | 12.6 | | 13 | 143 | 63 | 206 |
| DSX1270F08 | 12.7 | | 13 | 143 | 63 | 206 |
| DSX1280F08 | 12.8 | | 13 | 143 | 63 | 206 |
| DSX1290F08 | 12.9 | | 13 | 143 | 63 | 206 |
| DSX1300F08 | 13 | ● | 13 | 143 | 63 | 206 |
| DSX1310F08 | 13.1 | | 14 | 154 | 64 | 218 |
| DSX1320F08 | 13.2 | | 14 | 154 | 64 | 218 |
| DSX1330F08 | 13.3 | | 14 | 154 | 64 | 218 |
| DSX1340F08 | 13.4 | | 14 | 154 | 64 | 218 |
| DSX1350F08 | 13.5 | ● | 14 | 154 | 64 | 218 |
| DSX1360F08 | 13.6 | | 14 | 154 | 64 | 218 |
| DSX1370F08 | 13.7 | | 14 | 154 | 64 | 218 |
| DSX1380F08 | 13.8 | | 14 | 154 | 64 | 218 |
| DSX1390F08 | 13.9 | | 14 | 154 | 64 | 218 |
| DSX1400F08 | 14 | ● | 14 | 154 | 64 | 218 |
| DSX1410F08 | 14.1 | | 15 | 165 | 65 | 230 |
| DSX1420F08 | 14.2 | | 15 | 165 | 65 | 230 |
| DSX1430F08 | 14.3 | | 15 | 165 | 65 | 230 |
| DSX1440F08 | 14.4 | | 15 | 165 | 65 | 230 |
| DSX1450F08 | 14.5 | ● | 15 | 165 | 65 | 230 |
| DSX1460F08 | 14.6 | | 15 | 165 | 65 | 230 |
| DSX1470F08 | 14.7 | | 15 | 165 | 65 | 230 |
| DSX1480F08 | 14.8 | | 15 | 165 | 65 | 230 |
| DSX1490F08 | 14.9 | | 15 | 165 | 65 | 230 |
| DSX1500F08 | 15 | ● | 15 | 165 | 65 | 230 |
| DSX1510F08 | 15.1 | | 16 | 176 | 66 | 242 |
| DSX1520F08 | 15.2 | | 16 | 176 | 66 | 242 |
| DSX1530F08 | 15.3 | | 16 | 176 | 66 | 242 |
| DSX1540F08 | 15.4 | | 16 | 176 | 66 | 242 |
| DSX1550F08 | 15.5 | ● | 16 | 176 | 66 | 242 |

● : Line-up

| Designation | øDc | AH180 | øDs | ℓ | ℓs | L |
|---|---|---|---|---|---|---|
| DSX1560F08 | 15.6 | | 16 | 176 | 66 | 242 |
| DSX1570F08 | 15.7 | | 16 | 176 | 66 | 242 |
| DSX1580F08 | 15.8 | | 16 | 176 | 66 | 242 |
| DSX1590F08 | 15.9 | | 16 | 176 | 66 | 242 |
| DSX1600F08 | 16 | ● | 16 | 176 | 66 | 242 |

● : Line-up

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Examples JIS (ISO) | Hardness | Cutting speed: *Vc* (m/min) | | | Feed: *f* (mm/rev) | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | ø3 ~ ø6 | ø6 ~ ø10 | ø10 ~ ø20 | ø3 ~ ø6 | ø6 ~ ø10 | ø10 ~ ø20 |
| P | Mild steels, Low carbon steels | C15E4, E275A | < 180HB | 70 - 140 | 80 - 160 | 90 - 190 | 0.15 - 0.25 | 0.2 - 0.35 | 0.25 - 0.4 |
| P | Carbon steels, Alloy steels | C45, 42CrMo4 | 180 ~ 300HB | 50 - 130 | 70 - 160 | 80 - 170 | 0.15 - 0.25 | 0.2 - 0.35 | 0.25 - 0.4 |
| P | High alloy steels etc. | 42CrMoS4 | 250 ~ 350HB | 40 - 100 | 60 - 140 | 60 - 160 | 0.1 - 0.2 | 0.15 - 0.3 | 0.15 - 0.3 |
| M | Stainless steels | X5CrNi18-9 | < 200HB | 30 - 70 | 50 - 100 | 50 - 120 | 0.1 - 0.2 | 0.1 - 0.25 | 0.15 - 0.35 |
| K | Grey cast irons | 250 | < 200HB | 80 - 140 | 100 - 160 | 100 - 180 | 0.15 - 0.35 | 0.2 - 0.4 | 0.25 - 0.5 |
| K | Ductile cast irons | 450-10S | < 300HB | 70 - 140 | 80 - 150 | 80 - 170 | 0.15 - 0.35 | 0.2 - 0.4 | 0.25 - 0.45 |
| N | Aluminium alloys | AlSi11Cu3 | - | 80 - 160 | 100 - 180 | 100 - 190 | 0.15 - 0.35 | 0.2 - 0.45 | 0.25 - 0.6 |
| S | Titanium alloys | Ti-6Al-4V | - | 25 - 60 | 30 - 80 | 30 - 80 | 0.1 - 0.2 | 0.1 - 0.25 | 0.15 - 0.35 |
| S | Heat-resistant alloys | Inconel | 250HB < | 10 - 30 | 10 - 40 | 10 - 40 | 0.02 - 0.1 | 0.05 - 0.15 | 0.1 - 0.25 |
| H | High hardened steels | X153CrMoV12 | < 40HRC | 20 - 50 | 30 - 60 | 30 - 60 | 0.08 - 0.1 | 0.1 - 0.15 | 0.12 - 0.2 |

Note: • The cutting parameters shown in the table are merely a starting guideline for general machining.
• Values should be varied depending on the power or rigidity of the machine to be used. For the smaller side of drill diameters, select lower feeds.

• No. of revolutions ($min^{-1}$) = Cutting speed × 1000 ÷ 3.14 ÷ Tool diameter
• Table feed (mm/min) = No. of revolutions × Feed per revolution

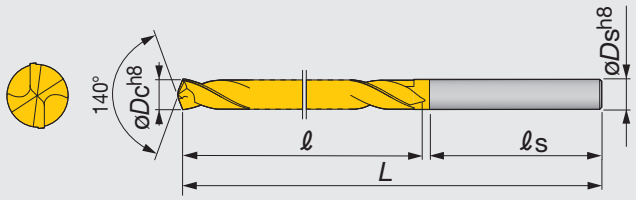
• Chip packing in the oil holes may cause drill breakage. A filter preventing the circulation of chips should be used on coolant supply.
• Inconel is trademark of Huntington Alloys, Inc.

# GIGAPOWERDRILL

## DSE-F02

Soliddrill with 140° point angle without oil hole & shank size same as diameter, L/D = 2, dia = ø3 -ø16 mm






| Designation | øDc | AH180 | øDs | ℓ | ℓs | L |
|---|---|---|---|---|---|---|
| DSE0300F02 | 3 | ● | 3 | 16 | 30 | 46 |
| DSE0310F02 | 3.1 | | 3.1 | 18 | 31 | 49 |
| DSE0320F02 | 3.2 | ● | 3.2 | 18 | 31 | 49 |
| DSE0330F02 | 3.3 | | 3.3 | 18 | 31 | 49 |
| DSE0340F02 | 3.4 | ● | 3.4 | 20 | 32 | 52 |
| DSE0350F02 | 3.5 | ● | 3.5 | 20 | 32 | 52 |
| DSE0360F02 | 3.6 | | 3.6 | 20 | 32 | 52 |
| DSE0370F02 | 3.7 | | 3.7 | 20 | 32 | 52 |
| DSE0380F02 | 3.8 | | 3.8 | 22 | 33 | 55 |
| DSE0390F02 | 3.9 | | 3.9 | 22 | 33 | 55 |
| DSE0400F02 | 4 | ● | 4 | 22 | 33 | 55 |
| DSE0410F02 | 4.1 | | 4.1 | 22 | 33 | 55 |
| DSE0420F02 | 4.2 | | 4.2 | 22 | 33 | 55 |
| DSE0430F02 | 4.3 | ● | 4.3 | 24 | 34 | 58 |
| DSE0440F02 | 4.4 | | 4.4 | 24 | 34 | 58 |
| DSE0450F02 | 4.5 | ● | 4.5 | 24 | 34 | 58 |
| DSE0460F02 | 4.6 | | 4.6 | 24 | 34 | 58 |
| DSE0470F02 | 4.7 | | 4.7 | 24 | 34 | 58 |
| DSE0480F02 | 4.8 | | 4.8 | 26 | 36 | 62 |
| DSE0490F02 | 4.9 | | 4.9 | 26 | 36 | 62 |
| DSE0500F02 | 5 | ● | 5 | 26 | 36 | 62 |
| DSE0510F02 | 5.1 | ● | 5.1 | 26 | 36 | 62 |
| DSE0520F02 | 5.2 | | 5.2 | 26 | 36 | 62 |
| DSE0530F02 | 5.3 | | 5.3 | 26 | 36 | 62 |
| DSE0540F02 | 5.4 | | 5.4 | 28 | 38 | 66 |
| DSE0550F02 | 5.5 | ● | 5.5 | 28 | 38 | 66 |
| DSE0560F02 | 5.6 | ● | 5.6 | 28 | 38 | 66 |
| DSE0570F02 | 5.7 | | 5.7 | 28 | 38 | 66 |
| DSE0580F02 | 5.8 | | 5.8 | 28 | 38 | 66 |
| DSE0590F02 | 5.9 | | 5.9 | 28 | 38 | 66 |
| DSE0600F02 | 6 | ● | 6 | 28 | 38 | 66 |
| DSE0610F02 | 6.1 | | 6.1 | 31 | 39 | 70 |
| DSE0620F02 | 6.2 | | 6.2 | 31 | 39 | 70 |
| DSE0630F02 | 6.3 | | 6.3 | 31 | 39 | 70 |
| DSE0640F02 | 6.4 | ● | 6.4 | 31 | 39 | 70 |
| DSE0650F02 | 6.5 | ● | 6.5 | 31 | 39 | 70 |
| DSE0660F02 | 6.6 | | 6.6 | 31 | 39 | 70 |
| DSE0670F02 | 6.7 | | 6.7 | 31 | 39 | 70 |
| DSE0680F02 | 6.8 | ● | 6.8 | 34 | 40 | 74 |
| DSE0690F02 | 6.9 | | 6.9 | 34 | 40 | 74 |
| DSE0700F02 | 7 | ● | 7 | 34 | 40 | 74 |
| DSE0710F02 | 7.1 | | 7.1 | 34 | 40 | 74 |
| DSE0720F02 | 7.2 | | 7.2 | 34 | 40 | 74 |
| DSE0730F02 | 7.3 | | 7.3 | 34 | 40 | 74 |
| DSE0740F02 | 7.4 | | 7.4 | 34 | 40 | 74 |
| DSE0750F02 | 7.5 | ● | 7.5 | 34 | 40 | 74 |
| DSE0760F02 | 7.6 | | 7.6 | 37 | 42 | 79 |
| DSE0770F02 | 7.7 | | 7.7 | 37 | 42 | 79 |
| DSE0780F02 | 7.8 | | 7.8 | 37 | 42 | 79 |
| DSE0790F02 | 7.9 | | 7.9 | 37 | 42 | 79 |
| DSE0800F02 | 8 | ● | 8 | 37 | 42 | 79 |
| DSE0810F02 | 8.1 | | 8.1 | 37 | 42 | 79 |

| Designation | øDc | AH180 | øDs | ℓ | ℓs | L |
|---|---|---|---|---|---|---|
| DSE0820F02 | 8.2 | | 8.2 | 37 | 42 | 79 |
| DSE0830F02 | 8.3 | | 8.3 | 37 | 42 | 79 |
| DSE0840F02 | 8.4 | | 8.4 | 37 | 42 | 79 |
| DSE0850F02 | 8.5 | ● | 8.5 | 37 | 42 | 79 |
| DSE0860F02 | 8.6 | | 8.6 | 40 | 44 | 84 |
| DSE0870F02 | 8.7 | | 8.7 | 40 | 44 | 84 |
| DSE0880F02 | 8.8 | | 8.8 | 40 | 44 | 84 |
| DSE0890F02 | 8.9 | | 8.9 | 40 | 44 | 84 |
| DSE0900F02 | 9 | ● | 9 | 40 | 44 | 84 |
| DSE0910F02 | 9.1 | | 9.1 | 40 | 44 | 84 |
| DSE0920F02 | 9.2 | | 9.2 | 40 | 44 | 84 |
| DSE0930F02 | 9.3 | | 9.3 | 40 | 44 | 84 |
| DSE0940F02 | 9.4 | | 9.4 | 40 | 44 | 84 |
| DSE0950F02 | 9.5 | ● | 9.5 | 40 | 44 | 84 |
| DSE0960F02 | 9.6 | | 9.6 | 43 | 46 | 89 |
| DSE0970F02 | 9.7 | | 9.7 | 43 | 46 | 89 |
| DSE0980F02 | 9.8 | | 9.8 | 43 | 46 | 89 |
| DSE0990F02 | 9.9 | | 9.9 | 43 | 46 | 89 |
| DSE1000F02 | 10 | ● | 10 | 43 | 46 | 89 |
| DSE1010F02 | 10.1 | | 10.1 | 43 | 46 | 89 |
| DSE1020F02 | 10.2 | | 10.2 | 43 | 46 | 89 |
| DSE1030F02 | 10.3 | ● | 10.3 | 43 | 46 | 89 |
| DSE1040F02 | 10.4 | | 10.4 | 43 | 46 | 89 |
| DSE1050F02 | 10.5 | ● | 10.5 | 43 | 46 | 89 |
| DSE1060F02 | 10.6 | | 10.6 | 43 | 46 | 89 |
| DSE1070F02 | 10.7 | | 10.7 | 47 | 48 | 95 |
| DSE1080F02 | 10.8 | | 10.8 | 47 | 48 | 95 |
| DSE1090F02 | 10.9 | | 10.9 | 47 | 48 | 95 |
| DSE1100F02 | 11 | ● | 11 | 47 | 48 | 95 |
| DSE1110F02 | 11.1 | | 11.1 | 47 | 48 | 95 |
| DSE1120F02 | 11.2 | | 11.2 | 47 | 48 | 95 |
| DSE1130F02 | 11.3 | | 11.3 | 47 | 48 | 95 |
| DSE1140F02 | 11.4 | | 11.4 | 47 | 48 | 95 |
| DSE1150F02 | 11.5 | ● | 11.5 | 47 | 48 | 95 |
| DSE1160F02 | 11.6 | | 11.6 | 47 | 48 | 95 |
| DSE1170F02 | 11.7 | | 11.7 | 47 | 48 | 95 |
| DSE1180F02 | 11.8 | | 11.8 | 47 | 48 | 95 |
| DSE1190F02 | 11.9 | | 11.9 | 51 | 51 | 102 |
| DSE1200F02 | 12 | ● | 12 | 51 | 51 | 102 |
| DSE1210F02 | 12.1 | | 12.1 | 51 | 51 | 102 |
| DSE1220F02 | 12.2 | | 12.2 | 51 | 51 | 102 |
| DSE1230F02 | 12.3 | | 12.3 | 51 | 51 | 102 |
| DSE1240F02 | 12.4 | | 12.4 | 51 | 51 | 102 |
| DSE1250F02 | 12.5 | ● | 12.5 | 51 | 51 | 102 |
| DSE1260F02 | 12.6 | | 12.6 | 51 | 51 | 102 |
| DSE1270F02 | 12.7 | | 12.7 | 51 | 51 | 102 |
| DSE1280F02 | 12.8 | | 12.8 | 51 | 51 | 102 |
| DSE1290F02 | 12.9 | | 12.9 | 51 | 51 | 102 |
| DSE1300F02 | 13 | ● | 13 | 51 | 51 | 102 |
| DSE1310F02 | 13.1 | | 13.1 | 51 | 51 | 102 |
| DSE1320F02 | 13.2 | | 13.2 | 51 | 51 | 102 |
| DSE1330F02 | 13.3 | | 13.3 | 54 | 53 | 107 |

● : Line-up

| Designation | øDc | AH180 | øDs | ℓ | ℓs | L |
|---|---|---|---|---|---|---|
| DSE1340F02 | 13.4 | | 13.4 | 54 | 53 | 107 |
| DSE1350F02 | 13.5 | ● | 13.5 | 54 | 53 | 107 |
| DSE1360F02 | 13.6 | | 13.6 | 54 | 53 | 107 |
| DSE1370F02 | 13.7 | | 13.7 | 54 | 53 | 107 |
| DSE1380F02 | 13.8 | | 13.8 | 54 | 53 | 107 |
| DSE1390F02 | 13.9 | | 13.9 | 54 | 53 | 107 |
| DSE1400F02 | 14 | ● | 14 | 54 | 53 | 107 |
| DSE1410F02 | 14.1 | | 14.1 | 56 | 55 | 111 |
| DSE1420F02 | 14.2 | | 14.2 | 56 | 55 | 111 |
| DSE1430F02 | 14.3 | | 14.3 | 56 | 55 | 111 |
| DSE1440F02 | 14.4 | | 14.4 | 56 | 55 | 111 |
| DSE1450F02 | 14.5 | ● | 14.5 | 56 | 55 | 111 |
| DSE1460F02 | 14.6 | | 14.6 | 56 | 55 | 111 |
| DSE1470F02 | 14.7 | | 14.7 | 56 | 55 | 111 |
| DSE1480F02 | 14.8 | | 14.8 | 56 | 55 | 111 |
| DSE1490F02 | 14.9 | | 14.9 | 56 | 55 | 111 |
| DSE1500F02 | 15 | ● | 15 | 56 | 55 | 111 |
| DSE1510F02 | 15.1 | | 15.1 | 58 | 57 | 115 |
| DSE1520F02 | 15.2 | | 15.2 | 58 | 57 | 115 |
| DSE1530F02 | 15.3 | | 15.3 | 58 | 57 | 115 |
| DSE1540F02 | 15.4 | | 15.4 | 58 | 57 | 115 |
| DSE1550F02 | 15.5 | ● | 15.5 | 58 | 57 | 115 |
| DSE1560F02 | 15.6 | | 15.6 | 58 | 57 | 115 |
| DSE1570F02 | 15.7 | | 15.7 | 58 | 57 | 115 |
| DSE1580F02 | 15.8 | | 15.8 | 58 | 57 | 115 |
| DSE1590F02 | 15.9 | | 15.9 | 58 | 57 | 115 |
| DSE1600F02 | 16 | ● | 16 | 58 | 57 | 115 |

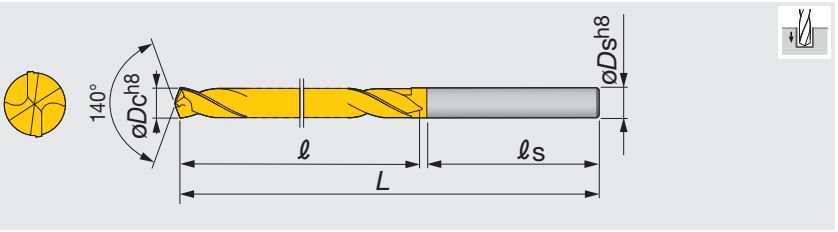
● : Line-up

# GIGAPOWERDRILL

## DSE-F03

Soliddrill with 140° point angle without oil hole & shank size same as diameter, L/D = 3, dia = ø3 -ø16 mm






| Designation | øDc | AH180 | øDs | ℓ | ℓs | L |
|---|---|---|---|---|---|---|
| DSE0300F03 | 3 | ● | 3 | 21 | 39 | 60 |
| DSE0310F03 | 3.1 | | 3.1 | 24 | 36 | 60 |
| DSE0320F03 | 3.2 | ● | 3.2 | 24 | 36 | 60 |
| DSE0330F03 | 3.3 | | 3.3 | 24 | 36 | 60 |
| DSE0340F03 | 3.4 | ● | 3.4 | 24 | 36 | 60 |
| DSE0350F03 | 3.5 | ● | 3.5 | 24 | 36 | 60 |
| DSE0360F03 | 3.6 | | 3.6 | 27 | 33 | 60 |
| DSE0370F03 | 3.7 | | 3.7 | 27 | 33 | 60 |
| DSE0380F03 | 3.8 | | 3.8 | 27 | 33 | 60 |
| DSE0390F03 | 3.9 | | 3.9 | 27 | 33 | 60 |
| DSE0400F03 | 4 | ● | 4 | 27 | 33 | 60 |
| DSE0410F03 | 4.1 | | 4.1 | 29 | 34 | 63 |
| DSE0420F03 | 4.2 | | 4.2 | 29 | 34 | 63 |
| DSE0430F03 | 4.3 | ● | 4.3 | 29 | 34 | 63 |
| DSE0440F03 | 4.4 | | 4.4 | 29 | 34 | 63 |
| DSE0450F03 | 4.5 | ● | 4.5 | 29 | 34 | 63 |
| DSE0460F03 | 4.6 | | 4.6 | 32 | 36 | 68 |
| DSE0470F03 | 4.7 | | 4.7 | 32 | 36 | 68 |
| DSE0480F03 | 4.8 | | 4.8 | 32 | 36 | 68 |
| DSE0490F03 | 4.9 | | 4.9 | 32 | 36 | 68 |
| DSE0500F03 | 5 | ● | 5 | 32 | 36 | 68 |
| DSE0510F03 | 5.1 | ● | 5.1 | 34 | 38 | 72 |
| DSE0520F03 | 5.2 | | 5.2 | 34 | 38 | 72 |
| DSE0530F03 | 5.3 | | 5.3 | 34 | 38 | 72 |
| DSE0540F03 | 5.4 | | 5.4 | 34 | 38 | 72 |
| DSE0550F03 | 5.5 | ● | 5.5 | 34 | 38 | 72 |
| DSE0560F03 | 5.6 | | 5.6 | 36 | 38 | 74 |
| DSE0570F03 | 5.7 | | 5.7 | 36 | 38 | 74 |
| DSE0580F03 | 5.8 | | 5.8 | 36 | 38 | 74 |
| DSE0590F03 | 5.9 | | 5.9 | 36 | 38 | 74 |
| DSE0600F03 | 6 | ● | 6 | 41 | 40 | 81 |
| DSE0610F03 | 6.1 | | 6.1 | 41 | 40 | 81 |
| DSE0620F03 | 6.2 | | 6.2 | 41 | 40 | 81 |
| DSE0630F03 | 6.3 | | 6.3 | 41 | 40 | 81 |
| DSE0640F03 | 6.4 | | 6.4 | 41 | 40 | 81 |
| DSE0650F03 | 6.5 | ● | 6.5 | 41 | 40 | 81 |
| DSE0660F03 | 6.6 | | 6.6 | 43 | 40 | 83 |
| DSE0670F03 | 6.7 | | 6.7 | 43 | 40 | 83 |
| DSE0680F03 | 6.8 | ● | 6.8 | 43 | 40 | 83 |
| DSE0690F03 | 6.9 | | 6.9 | 43 | 40 | 83 |
| DSE0700F03 | 7 | ● | 7 | 43 | 40 | 83 |
| DSE0710F03 | 7.1 | | 7.1 | 45 | 42 | 87 |
| DSE0720F03 | 7.2 | | 7.2 | 45 | 42 | 87 |
| DSE0730F03 | 7.3 | | 7.3 | 45 | 42 | 87 |
| DSE0740F03 | 7.4 | ● | 7.4 | 45 | 42 | 87 |
| DSE0750F03 | 7.5 | ● | 7.5 | 45 | 42 | 87 |
| DSE0760F03 | 7.6 | | 7.6 | 48 | 42 | 90 |
| DSE0770F03 | 7.7 | | 7.7 | 48 | 42 | 90 |
| DSE0780F03 | 7.8 | | 7.8 | 48 | 42 | 90 |
| DSE0790F03 | 7.9 | | 7.9 | 48 | 42 | 90 |
| DSE0800F03 | 8 | ● | 8 | 48 | 42 | 90 |
| DSE0810F03 | 8.1 | | 8.1 | 53 | 43 | 96 |
| DSE0820F03 | 8.2 | | 8.2 | 53 | 43 | 96 |
| DSE0830F03 | 8.3 | | 8.3 | 53 | 43 | 96 |
| DSE0840F03 | 8.4 | | 8.4 | 53 | 43 | 96 |
| DSE0850F03 | 8.5 | ● | 8.5 | 53 | 43 | 96 |
| DSE0860F03 | 8.6 | ● | 8.6 | 55 | 43 | 98 |
| DSE0870F03 | 8.7 | | 8.7 | 55 | 43 | 98 |
| DSE0880F03 | 8.8 | | 8.8 | 55 | 43 | 98 |
| DSE0890F03 | 8.9 | | 8.9 | 55 | 43 | 98 |
| DSE0900F03 | 9 | ● | 9 | 55 | 43 | 98 |
| DSE0910F03 | 9.1 | | 9.1 | 58 | 44 | 102 |
| DSE0920F03 | 9.2 | | 9.2 | 58 | 44 | 102 |

| Designation | øDc | AH180 | øDs | ℓ | ℓs | L |
|---|---|---|---|---|---|---|
| DSE0930F03 | 9.3 | | 9.3 | 58 | 44 | 102 |
| DSE0940F03 | 9.4 | | 9.4 | 58 | 44 | 102 |
| DSE0950F03 | 9.5 | ● | 9.5 | 58 | 44 | 102 |
| DSE0960F03 | 9.6 | | 9.6 | 60 | 45 | 105 |
| DSE0970F03 | 9.7 | | 9.7 | 60 | 45 | 105 |
| DSE0980F03 | 9.8 | | 9.8 | 60 | 45 | 105 |
| DSE0990F03 | 9.9 | | 9.9 | 60 | 45 | 105 |
| DSE1000F03 | 10 | ● | 10 | 60 | 45 | 105 |
| DSE1010F03 | 10.1 | | 10.1 | 66 | 46 | 112 |
| DSE1020F03 | 10.2 | | 10.2 | 66 | 46 | 112 |
| DSE1030F03 | 10.3 | ● | 10.3 | 66 | 46 | 112 |
| DSE1040F03 | 10.4 | | 10.4 | 66 | 46 | 112 |
| DSE1050F03 | 10.5 | ● | 10.5 | 66 | 46 | 112 |
| DSE1060F03 | 10.6 | | 10.6 | 68 | 46 | 114 |
| DSE1070F03 | 10.7 | | 10.7 | 68 | 46 | 114 |
| DSE1080F03 | 10.8 | | 10.8 | 68 | 46 | 114 |
| DSE1090F03 | 10.9 | | 10.9 | 68 | 46 | 114 |
| DSE1100F03 | 11 | ● | 11 | 68 | 46 | 114 |
| DSE1110F03 | 11.1 | | 11.1 | 71 | 47 | 118 |
| DSE1120F03 | 11.2 | | 11.2 | 71 | 47 | 118 |
| DSE1130F03 | 11.3 | | 11.3 | 71 | 47 | 118 |
| DSE1140F03 | 11.4 | | 11.4 | 71 | 47 | 118 |
| DSE1150F03 | 11.5 | ● | 11.5 | 71 | 47 | 118 |
| DSE1160F03 | 11.6 | | 11.6 | 73 | 48 | 121 |
| DSE1170F03 | 11.7 | | 11.7 | 73 | 48 | 121 |
| DSE1180F03 | 11.8 | | 11.8 | 73 | 48 | 121 |
| DSE1190F03 | 11.9 | | 11.9 | 73 | 48 | 121 |
| DSE1200F03 | 12 | ● | 12 | 73 | 48 | 121 |
| DSE1210F03 | 12.1 | | 12.1 | 76 | 59 | 135 |
| DSE1220F03 | 12.2 | | 12.2 | 76 | 59 | 135 |
| DSE1230F03 | 12.3 | | 12.3 | 76 | 59 | 135 |
| DSE1240F03 | 12.4 | | 12.4 | 76 | 59 | 135 |
| DSE1250F03 | 12.5 | ● | 12.5 | 76 | 59 | 135 |
| DSE1260F03 | 12.6 | | 12.6 | 78 | 59 | 137 |
| DSE1270F03 | 12.7 | | 12.7 | 78 | 59 | 137 |
| DSE1280F03 | 12.8 | | 12.8 | 78 | 59 | 137 |
| DSE1290F03 | 12.9 | | 12.9 | 78 | 59 | 137 |
| DSE1300F03 | 13 | ● | 13 | 78 | 59 | 137 |
| DSE1310F03 | 13.1 | | 13.1 | 84 | 60 | 144 |
| DSE1320F03 | 13.2 | | 13.2 | 84 | 60 | 144 |
| DSE1330F03 | 13.3 | | 13.3 | 84 | 60 | 144 |
| DSE1340F03 | 13.4 | | 13.4 | 84 | 60 | 144 |
| DSE1350F03 | 13.5 | ● | 13.5 | 84 | 60 | 144 |
| DSE1360F03 | 13.6 | | 13.6 | 86 | 61 | 147 |
| DSE1370F03 | 13.7 | | 13.7 | 86 | 61 | 147 |
| DSE1380F03 | 13.8 | | 13.8 | 86 | 61 | 147 |
| DSE1390F03 | 13.9 | | 13.9 | 86 | 61 | 147 |
| DSE1400F03 | 14 | ● | 14 | 86 | 61 | 147 |
| DSE1410F03 | 14.1 | | 14.1 | 89 | 62 | 151 |
| DSE1420F03 | 14.2 | | 14.2 | 89 | 62 | 151 |
| DSE1430F03 | 14.3 | | 14.3 | 89 | 62 | 151 |
| DSE1440F03 | 14.4 | | 14.4 | 89 | 62 | 151 |
| DSE1450F03 | 14.5 | ● | 14.5 | 89 | 62 | 151 |
| DSE1460F03 | 14.6 | | 14.6 | 91 | 62 | 153 |
| DSE1470F03 | 14.7 | | 14.7 | 91 | 62 | 153 |
| DSE1480F03 | 14.8 | | 14.8 | 91 | 62 | 153 |
| DSE1490F03 | 14.9 | | 14.9 | 91 | 62 | 153 |
| DSE1500F03 | 15 | ● | 15 | 91 | 62 | 153 |
| DSE1510F03 | 15.1 | | 15.1 | 94 | 63 | 157 |
| DSE1520F03 | 15.2 | | 15.2 | 94 | 63 | 157 |
| DSE1530F03 | 15.3 | | 15.3 | 94 | 63 | 157 |
| DSE1540F03 | 15.4 | | 15.4 | 94 | 63 | 157 |
| DSE1550F03 | 15.5 | ● | 15.5 | 94 | 63 | 157 |

● : Line-up

| Designation | øDc | AH180 | øDs | ℓ | ℓs | L |
|---|---|---|---|---|---|---|
| DSE1560F03 | 15.6 | | 15.6 | 96 | 64 | 160 |
| DSE1570F03 | 15.7 | | 15.7 | 96 | 64 | 160 |
| DSE1580F03 | 15.8 | | 15.8 | 96 | 64 | 160 |
| DSE1590F03 | 15.9 | | 15.9 | 96 | 64 | 160 |
| DSE1600F03 | 16 | ● | 16 | 96 | 64 | 160 |

● : Line-up

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Examples | Hardness | Cutting speed: *Vc* (m/min) | | | Feed: *f* (mm/rev) | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | ø3 ~ ø6 | ø6 ~ ø10 | ø10 ~ ø20 | ø3 ~ ø6 | ø5 ~ ø10 | ø10 ~ ø20 |
| P | Mild steels, Low carbon steels | E275A | < 180HB | 40 - 100 | 60 - 120 | 60 - 130 | 0.15 - 0.3 | 0.15 - 0.35 | 0.2 - 0.5 |
| | Carbon steels, Alloy steels | C45 | 180 ~ 300HB | 40 - 90 | 50 - 120 | 60 - 130 | 0.15 - 0.3 | 0.15 - 0.35 | 0.15 - 0.4 |
| | High alloy steels etc. | 42CrMo4 | 250 ~ 350HB | 40 - 80 | 50 - 100 | 50 - 100 | 0.1 - 0.2 | 0.15 - 0.25 | 0.15 - 0.35 |
| M | Stainless steels | X5CrNi18-9 | < 200HB | 10 - 20 | 10 - 20 | 10 - 20 | 0.05 - 0.15 | 0.05 - 0.15 | 0.05 - 0.15 |
| K | Grey cast irons | 300 | < 200HB | 40 - 90 | 50 - 95 | 50 - 100 | 0.15 - 0.3 | 0.2 - 0.4 | 0.2 - 0.4 |
| | Ductile cast irons | 600-3 | < 300HB | 35 - 80 | 40 - 85 | 45 - 90 | 0.15 - 0.3 | 0.2 - 0.4 | 0.2 - 0.4 |
| S | Titanium alloys | Ti-6Al-4V | | 20 - 40 | 20 - 40 | 20 - 40 | 0.1 - 0.2 | 0.15 - 0.25 | 0.15 - 0.4 |
| | Heat-resistant alloys | Inconel718 | 250HB < | 10 - 30 | 10 - 30 | 10 - 30 | 0.03 - 0.07 | 0.05 - 0.1 | 0.07 - 0.12 |
| H | High hardened steels | X153CrMoV12 | < 40HRC | 20 - 40 | 20 - 40 | 20 - 40 | 0.05 - 0.15 | 0.05 - 0.15 | 0.07 - 0.2 |

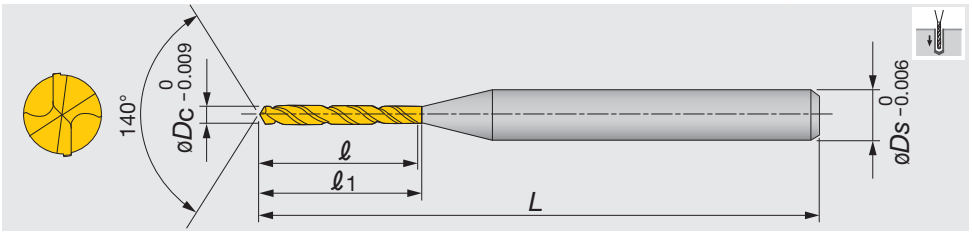
Notes:
- Because the cutting conditions may be changed depending on the material type, hardness, machinability, machine tool, and coolant, the most appropriate conditions must be decided whilst referring the chip control condition and tool failure mode.
- When using the smaller side of the diameter range, the feed rate should be set lower.
- When drilling difficult-to-cut materials, coolant supplying conditions are critical for successful drilling. So, the use of constant and flood coolant is highly recommended.
- For the standard DSE-type drills, somewhat large honing width intended for drilling of general steels is applied. But, when drilling difficult-to-cut materials having high hardness, requiring lowering the feed rate, the honing width should be modified.
- The drills with special honing specification are made to order on request.
- Inconel is trademark of Huntington Alloys, Inc.

# GIGAMINIDRILL

## DSM

Micro soliddrill with std. shank size of ø3 mm, without coolant hole, dia.= ø0.1 mm - ø3 mm, L/D = 5 -15






| Designation | øDc | Coating YH170 | Coating YH180 | øDs | ℓ | ℓ1 | L |
|---|---|---|---|---|---|---|---|
| DSM0010G10 | 0.1 | ● | | 3 | 1.15 | 1.4 | 38 |
| DSM0011G10 | 0.11 | ● | | 3 | 1.25 | 1.5 | 38 |
| DSM0012G10 | 0.12 | ● | | 3 | 1.35 | 1.6 | 38 |
| DSM0013G10 | 0.13 | ● | | 3 | 1.55 | 1.8 | 38 |
| DSM0014G10 | 0.14 | ● | | 3 | 1.65 | 1.9 | 38 |
| DSM0015G10 | 0.15 | ● | | 3 | 1.75 | 2 | 38 |
| DSM0016G10 | 0.16 | ● | | 3 | 1.85 | 2.1 | 38 |
| DSM0017G10 | 0.17 | ● | | 3 | 1.95 | 2.2 | 38 |
| DSM0018G10 | 0.18 | ● | | 3 | 2.15 | 2.4 | 38 |
| DSM0019G10 | 0.19 | ● | | 3 | 2.25 | 2.5 | 38 |
| DSM0020G10 | 0.2 | ● | | 3 | 2.35 | 2.6 | 38 |
| DSM0021G10 | 0.21 | ● | | 3 | 2.45 | 2.7 | 38 |
| DSM0022G10 | 0.22 | ● | | 3 | 2.55 | 2.8 | 38 |
| DSM0023G10 | 0.23 | ● | | 3 | 2.75 | 3 | 38 |
| DSM0024G10 | 0.24 | ● | | 3 | 2.85 | 3.1 | 38 |
| DSM0025G10 | 0.25 | ● | | 3 | 3 | 3.3 | 38 |
| DSM0026G10 | 0.26 | ● | | 3 | 3.1 | 3.4 | 38 |
| DSM0027G10 | 0.27 | ● | | 3 | 3.2 | 3.5 | 38 |
| DSM0028G10 | 0.28 | ● | | 3 | 3.4 | 3.7 | 38 |
| DSM0029G10 | 0.29 | ● | | 3 | 3.5 | 3.8 | 38 |
| DSM0030G10 | 0.3 | ● | | 3 | 3.9 | 4.2 | 38 |
| DSM0031G15 | 0.31 | ● | | 3 | 5.6 | 5.9 | 38 |
| DSM0032G15 | 0.32 | ● | | 3 | 5.6 | 5.9 | 38 |
| DSM0033G15 | 0.33 | ● | | 3 | 5.6 | 5.9 | 38 |
| DSM0034G15 | 0.34 | ● | | 3 | 5.6 | 5.9 | 38 |
| DSM0035G15 | 0.35 | ● | | 3 | 5.6 | 5.9 | 38 |
| DSM0036G15 | 0.36 | ● | | 3 | 6.5 | 6.8 | 38 |
| DSM0037G15 | 0.37 | ● | | 3 | 6.5 | 6.8 | 38 |
| DSM0038G15 | 0.38 | ● | | 3 | 6.5 | 6.8 | 38 |
| DSM0039G15 | 0.39 | ● | | 3 | 6.5 | 6.8 | 38 |
| DSM0040G15 | 0.4 | ● | | 3 | 6.5 | 6.8 | 38 |
| DSM0041G15 | 0.41 | ● | | 3 | 7.4 | 7.7 | 38 |
| DSM0042G15 | 0.42 | ● | | 3 | 7.4 | 7.7 | 38 |
| DSM0043G15 | 0.43 | ● | | 3 | 7.4 | 7.7 | 38 |
| DSM0044G15 | 0.44 | ● | | 3 | 7.4 | 7.7 | 38 |
| DSM0045G15 | 0.45 | ● | | 3 | 7.4 | 7.7 | 38 |
| DSM0046G15 | 0.46 | ● | | 3 | 8.1 | 8.7 | 38 |
| DSM0047G15 | 0.47 | ● | | 3 | 8.1 | 8.7 | 38 |
| DSM0048G15 | 0.48 | ● | | 3 | 8.1 | 8.7 | 38 |
| DSM0049G15 | 0.49 | ● | | 3 | 8.1 | 8.7 | 38 |
| DSM0050G15 | 0.5 | ● | | 3 | 8.1 | 8.7 | 38 |
| DSM0051G10 | 0.51 | | | 3 | 6.6 | 7.2 | 38 |
| DSM0052G10 | 0.52 | | | 3 | 6.6 | 7.2 | 38 |
| DSM0053G10 | 0.53 | | | 3 | 6.6 | 7.2 | 38 |
| DSM0054G10 | 0.54 | | | 3 | 6.6 | 7.2 | 38 |
| DSM0055G10 | 0.55 | ● | | 3 | 6.6 | 7.2 | 38 |
| DSM0056G10 | 0.56 | | | 3 | 7.3 | 7.9 | 38 |
| DSM0057G10 | 0.57 | | | 3 | 7.3 | 7.9 | 38 |
| DSM0058G10 | 0.58 | | | 3 | 7.3 | 7.9 | 38 |
| DSM0059G10 | 0.59 | | | 3 | 7.3 | 7.9 | 38 |
| DSM0060G10 | 0.6 | ● | | 3 | 7.3 | 7.9 | 38 |
| DSM0061G10 | 0.61 | | | 3 | 7.9 | 8.5 | 38 |
| DSM0062G10 | 0.62 | | | 3 | 7.9 | 8.5 | 38 |
| DSM0063G10 | 0.63 | | | 3 | 7.9 | 8.5 | 38 |
| DSM0064G10 | 0.64 | | | 3 | 7.9 | 8.5 | 38 |
| DSM0065G10 | 0.65 | ● | | 3 | 7.9 | 8.5 | 38 |
| DSM0066G10 | 0.66 | | | 3 | 8.6 | 9.2 | 38 |
| DSM0067G10 | 0.67 | | | 3 | 8.6 | 9.2 | 38 |
| DSM0068G10 | 0.68 | | | 3 | 8.6 | 9.2 | 38 |
| DSM0069G10 | 0.69 | | | 3 | 8.6 | 9.2 | 38 |
| DSM0070G10 | 0.7 | ● | | 3 | 8.6 | 9.2 | 38 |
| DSM0071G10 | 0.71 | | | 3 | 9.2 | 9.8 | 38 |
| DSM0072G10 | 0.72 | | | 3 | 9.2 | 9.8 | 38 |
| DSM0073G10 | 0.73 | | | 3 | 9.2 | 9.8 | 38 |
| DSM0074G10 | 0.74 | | | 3 | 9.2 | 9.8 | 38 |

| Designation | øDc | Coating YH170 | Coating YH180 | øDs | ℓ | ℓ1 | L |
|---|---|---|---|---|---|---|---|
| DSM0075G10 | 0.75 | ● | | 3 | 9.2 | 9.8 | 38 |
| DSM0076G10 | 0.76 | | | 3 | 9.9 | 10.5 | 38 |
| DSM0077G10 | 0.77 | | | 3 | 9.9 | 10.5 | 38 |
| DSM0078G10 | 0.78 | | | 3 | 9.9 | 10.5 | 38 |
| DSM0079G10 | 0.79 | | | 3 | 9.9 | 10.5 | 38 |
| DSM0080G10 | 0.8 | ● | | 3 | 9.9 | 10.5 | 38 |
| DSM0081G10 | 0.81 | | | 3 | 10.5 | 11.1 | 38 |
| DSM0082G10 | 0.82 | | | 3 | 10.5 | 11.1 | 38 |
| DSM0083G10 | 0.83 | | | 3 | 10.5 | 11.1 | 38 |
| DSM0084G10 | 0.84 | | | 3 | 10.5 | 11.1 | 38 |
| DSM0085G10 | 0.85 | | | 3 | 10.5 | 11.1 | 38 |
| DSM0086G10 | 0.86 | | | 3 | 9.9 | 10.5 | 38 |
| DSM0087G10 | 0.87 | | | 3 | 9.9 | 10.5 | 38 |
| DSM0088G10 | 0.88 | ● | | 3 | 9.9 | 10.5 | 38 |
| DSM0089G10 | 0.89 | | | 3 | 9.9 | 10.5 | 38 |
| DSM0090G10 | 0.9 | ● | | 3 | 9.9 | 10.5 | 38 |
| DSM0091G10 | 0.91 | | | 3 | 10.5 | 11.1 | 38 |
| DSM0092G10 | 0.92 | | | 3 | 10.5 | 11.1 | 38 |
| DSM0093G10 | 0.93 | | | 3 | 10.5 | 11.1 | 38 |
| DSM0094G10 | 0.94 | | | 3 | 10.5 | 11.1 | 38 |
| DSM0095G10 | 0.95 | | | 3 | 10.5 | 11.1 | 38 |
| DSM0096G10 | 0.96 | | | 3 | 11 | 11.6 | 38 |
| DSM0097G10 | 0.97 | ● | | 3 | 11 | 11.6 | 38 |
| DSM0098G10 | 0.98 | | | 3 | 11 | 11.6 | 38 |
| DSM0099G10 | 0.99 | | | 3 | 11 | 11.6 | 38 |
| DSM0100G10 | 1 | ● | | 3 | 11.5 | 12.1 | 38 |
| DSM0101G05 | 1.01 | | | 3 | 8 | 8.6 | 38 |
| DSM0102G05 | 1.02 | | | 3 | 8 | 8.6 | 38 |
| DSM0103G05 | 1.03 | | | 3 | 8 | 8.6 | 38 |
| DSM0104G05 | 1.04 | | | 3 | 8 | 8.6 | 38 |
| DSM0105G05 | 1.05 | | | 3 | 8 | 8.6 | 38 |
| DSM0106G05 | 1.06 | | | 3 | 8 | 8.6 | 38 |
| DSM0107G05 | 1.07 | | | 3 | 8 | 8.6 | 38 |
| DSM0108G05 | 1.08 | ● | | 3 | 8 | 8.6 | 38 |
| DSM0109G05 | 1.09 | | | 3 | 8 | 8.6 | 38 |
| DSM0110G05 | 1.1 | ● | | 3 | 8 | 8.6 | 38 |
| DSM0111G05 | 1.11 | | | 3 | 8.9 | 9.5 | 38 |
| DSM0112G05 | 1.12 | | | 3 | 8.9 | 9.5 | 38 |
| DSM0113G05 | 1.13 | | | 3 | 8.9 | 9.5 | 38 |
| DSM0114G05 | 1.14 | | | 3 | 8.9 | 9.5 | 38 |
| DSM0115G05 | 1.15 | | | 3 | 8.9 | 9.5 | 38 |
| DSM0116G05 | 1.16 | | | 3 | 8.9 | 9.5 | 38 |
| DSM0117G05 | 1.17 | | | 3 | 8.9 | 9.5 | 38 |
| DSM0118G05 | 1.18 | | | 3 | 8.9 | 9.5 | 38 |
| DSM0119G05 | 1.19 | | | 3 | 8.9 | 9.5 | 38 |
| DSM0120G05 | 1.2 | ● | | 3 | 8.9 | 9.5 | 38 |
| DSM0121G05 | 1.21 | | | 3 | 9.7 | 10.3 | 38 |
| DSM0122G05 | 1.22 | | | 3 | 9.7 | 10.3 | 38 |
| DSM0123G05 | 1.23 | | | 3 | 9.7 | 10.3 | 38 |
| DSM0124G05 | 1.24 | | | 3 | 9.7 | 10.3 | 38 |
| DSM0125G05 | 1.25 | | | 3 | 9.7 | 10.3 | 38 |
| DSM0126G05 | 1.26 | | | 3 | 9.7 | 10.3 | 38 |
| DSM0127G05 | 1.27 | | | 3 | 9.7 | 10.3 | 38 |
| DSM0128G05 | 1.28 | | | 3 | 9.7 | 10.3 | 38 |
| DSM0129G05 | 1.29 | | | 3 | 9.7 | 10.3 | 38 |
| DSM0130G05 | 1.3 | ● | | 3 | 9.7 | 10.3 | 38 |
| DSM0131G05 | 1.31 | | | 3 | 10.5 | 11.1 | 38 |
| DSM0132G05 | 1.32 | | | 3 | 10.5 | 11.1 | 38 |
| DSM0133G05 | 1.33 | | | 3 | 10.5 | 11.1 | 38 |
| DSM0134G05 | 1.34 | | | 3 | 10.5 | 11.1 | 38 |
| DSM0135G05 | 1.35 | | | 3 | 10.5 | 11.1 | 38 |
| DSM0136G05 | 1.36 | | | 3 | 10.5 | 11.1 | 38 |
| DSM0137G05 | 1.37 | | | 3 | 10.5 | 11.1 | 38 |
| DSM0138G05 | 1.38 | | | 3 | 10.5 | 11.1 | 38 |
| DSM0139G05 | 1.39 | | | 3 | 10.5 | 11.1 | 38 |

● : Line-up

| Designation | øDc | Coating YH170 | Coating YH180 | øDs | ℓ | ℓ1 | L |
|---|---|---|---|---|---|---|---|
| DSM0140G05 | 1.4 | ● | | 3 | 10.5 | 11.1 | 38 |
| DSM0141G05 | 1.41 | | | 3 | 11.3 | 11.9 | 38 |
| DSM0142G05 | 1.42 | | | 3 | 11.3 | 11.9 | 38 |
| DSM0143G05 | 1.43 | | | 3 | 11.3 | 11.9 | 38 |
| DSM0144G05 | 1.44 | | | 3 | 11.3 | 11.9 | 38 |
| DSM0145G05 | 1.45 | ● | | 3 | 11.3 | 11.9 | 38 |
| DSM0146G05 | 1.46 | | | 3 | 11.3 | 11.9 | 38 |
| DSM0147G05 | 1.47 | | | 3 | 11.3 | 11.9 | 38 |
| DSM0148G05 | 1.48 | | | 3 | 11.3 | 11.9 | 38 |
| DSM0149G05 | 1.49 | | | 3 | 11.3 | 11.9 | 38 |
| DSM0150G05 | 1.5 | ● | | 3 | 11.3 | 11.9 | 38 |
| DSM0151G05 | 1.51 | | | 3 | 12.1 | 12.7 | 45 |
| DSM0152G05 | 1.52 | | | 3 | 12.1 | 12.7 | 45 |
| DSM0153G05 | 1.53 | ● | | 3 | 12.1 | 12.7 | 45 |
| DSM0154G05 | 1.54 | | | 3 | 12.1 | 12.7 | 45 |
| DSM0155G05 | 1.55 | ● | | 3 | 12.1 | 12.7 | 45 |
| DSM0156G05 | 1.56 | | | 3 | 12.1 | 12.7 | 45 |
| DSM0157G05 | 1.57 | | | 3 | 12.1 | 12.7 | 45 |
| DSM0158G05 | 1.58 | | | 3 | 12.1 | 12.7 | 45 |
| DSM0159G05 | 1.59 | | | 3 | 12.1 | 12.7 | 45 |
| DSM0160G05 | 1.6 | ● | | 3 | 12.1 | 12.7 | 45 |
| DSM0161G05 | 1.61 | | | 3 | 12.9 | 13.6 | 45 |
| DSM0162G05 | 1.62 | | | 3 | 12.9 | 13.6 | 45 |
| DSM0163G05 | 1.63 | | | 3 | 12.9 | 13.6 | 45 |
| DSM0164G05 | 1.64 | | | 3 | 12.9 | 13.6 | 45 |
| DSM0165G05 | 1.65 | ● | | 3 | 12.9 | 13.6 | 45 |
| DSM0166G05 | 1.66 | | | 3 | 12.9 | 13.6 | 45 |
| DSM0167G05 | 1.67 | | | 3 | 12.9 | 13.6 | 45 |
| DSM0168G05 | 1.68 | | | 3 | 12.9 | 13.6 | 45 |
| DSM0169G05 | 1.69 | | | 3 | 12.9 | 13.6 | 45 |
| DSM0170G05 | 1.7 | ● | | 3 | 12.9 | 13.6 | 45 |
| DSM0171G05 | 1.71 | | | 3 | 13.7 | 14.3 | 45 |
| DSM0172G05 | 1.72 | | | 3 | 13.7 | 14.3 | 45 |
| DSM0173G05 | 1.73 | | | 3 | 13.7 | 14.3 | 45 |
| DSM0174G05 | 1.74 | | | 3 | 13.7 | 14.3 | 45 |
| DSM0175G05 | 1.75 | | | 3 | 13.7 | 14.3 | 45 |
| DSM0176G05 | 1.76 | | | 3 | 13.7 | 14.3 | 45 |
| DSM0177G05 | 1.77 | | | 3 | 13.7 | 14.3 | 45 |
| DSM0178G05 | 1.78 | | | 3 | 13.7 | 14.3 | 45 |
| DSM0179G05 | 1.79 | | | 3 | 13.7 | 14.3 | 45 |
| DSM0180G05 | 1.8 | ● | | 3 | 13.7 | 14.3 | 45 |
| DSM0181G05 | 1.81 | | | 3 | 14.5 | 15.1 | 45 |
| DSM0182G05 | 1.82 | ● | | 3 | 14.5 | 15.1 | 45 |
| DSM0183G05 | 1.83 | | | 3 | 14.5 | 15.1 | 45 |
| DSM0184G05 | 1.84 | | | 3 | 14.5 | 15.1 | 45 |
| DSM0185G05 | 1.85 | ● | | 3 | 14.5 | 15.1 | 45 |
| DSM0186G05 | 1.86 | | | 3 | 14.5 | 15.1 | 45 |
| DSM0187G05 | 1.87 | | | 3 | 14.5 | 15.1 | 45 |
| DSM0188G05 | 1.88 | | | 3 | 14.5 | 15.1 | 45 |
| DSM0189G05 | 1.89 | | | 3 | 14.5 | 15.1 | 45 |
| DSM0190G05 | 1.9 | ● | | 3 | 14.5 | 15.1 | 45 |
| DSM0191G05 | 1.91 | | | 3 | 15.3 | 15.9 | 45 |
| DSM0192G05 | 1.92 | | | 3 | 15.3 | 15.9 | 45 |
| DSM0193G05 | 1.93 | | | 3 | 15.3 | 15.9 | 45 |
| DSM0194G05 | 1.94 | | | 3 | 15.3 | 15.9 | 45 |
| DSM0195G05 | 1.95 | ● | | 3 | 15.3 | 15.9 | 45 |
| DSM0196G05 | 1.96 | | | 3 | 15.3 | 15.9 | 45 |
| DSM0197G05 | 1.97 | | | 3 | 15.3 | 15.9 | 45 |
| DSM0198G05 | 1.98 | | | 3 | 15.3 | 15.9 | 45 |
| DSM0199G05 | 1.99 | | | 3 | 15.3 | 15.9 | 45 |
| DSM0200G05 | 2 | | ● | 3 | 15.3 | 15.9 | 45 |
| DSM0201G05 | 2.01 | | | 3 | 16.1 | 16.7 | 45 |
| DSM0202G05 | 2.02 | | | 3 | 16.1 | 16.7 | 45 |
| DSM0203G05 | 2.03 | | ● | 3 | 16.1 | 16.7 | 45 |
| DSM0204G05 | 2.04 | | | 3 | 16.1 | 16.7 | 45 |
| DSM0205G05 | 2.05 | | | 3 | 16.1 | 16.7 | 45 |
| DSM0206G05 | 2.06 | | | 3 | 16.1 | 16.7 | 45 |
| DSM0207G05 | 2.07 | | | 3 | 16.1 | 16.7 | 45 |
| DSM0208G05 | 2.08 | | | 3 | 16.1 | 16.7 | 45 |
| DSM0209G05 | 2.09 | | | 3 | 16.1 | 16.7 | 45 |
| DSM0210G05 | 2.1 | | ● | 3 | 16.1 | 16.7 | 45 |
| DSM0211G05 | 2.11 | | | 3 | 16.9 | 17.5 | 45 |
| DSM0212G05 | 2.12 | | | 3 | 16.9 | 17.5 | 45 |
| DSM0213G05 | 2.13 | | | 3 | 16.9 | 17.5 | 45 |
| DSM0214G05 | 2.14 | | | 3 | 16.9 | 17.5 | 45 |
| DSM0215G05 | 2.15 | | | 3 | 16.9 | 17.5 | 45 |
| DSM0216G05 | 2.16 | | | 3 | 16.9 | 17.5 | 45 |
| DSM0217G05 | 2.17 | | | 3 | 16.9 | 17.5 | 45 |
| DSM0218G05 | 2.18 | | | 3 | 16.9 | 17.5 | 45 |
| DSM0219G05 | 2.19 | | | 3 | 16.9 | 17.5 | 45 |
| DSM0220G05 | 2.2 | | ● | 3 | 16.9 | 17.5 | 45 |

| Designation | øDc | Coating YH170 | Coating YH180 | øDs | ℓ | ℓ1 | L |
|---|---|---|---|---|---|---|---|
| DSM0221G05 | 2.21 | | | 3 | 17.7 | 18.3 | 45 |
| DSM0222G05 | 2.22 | | | 3 | 17.7 | 18.3 | 45 |
| DSM0223G05 | 2.23 | | | 3 | 17.7 | 18.3 | 45 |
| DSM0224G05 | 2.24 | | | 3 | 17.7 | 18.3 | 45 |
| DSM0225G05 | 2.25 | | | 3 | 17.7 | 18.3 | 45 |
| DSM0226G05 | 2.26 | | | 3 | 17.7 | 18.3 | 45 |
| DSM0227G05 | 2.27 | | | 3 | 17.7 | 18.3 | 45 |
| DSM0228G05 | 2.28 | | | 3 | 17.7 | 18.3 | 45 |
| DSM0229G05 | 2.29 | | | 3 | 17.7 | 18.3 | 45 |
| DSM0230G05 | 2.3 | | ● | 3 | 17.7 | 18.3 | 45 |
| DSM0231G05 | 2.31 | | | 3 | 18.5 | 19.1 | 55 |
| DSM0232G05 | 2.32 | | | 3 | 18.5 | 19.1 | 55 |
| DSM0233G05 | 2.33 | | | 3 | 18.5 | 19.1 | 55 |
| DSM0234G05 | 2.34 | | | 3 | 18.5 | 19.1 | 55 |
| DSM0235G05 | 2.35 | | | 3 | 18.5 | 19.1 | 55 |
| DSM0236G05 | 2.36 | | | 3 | 18.5 | 19.1 | 55 |
| DSM0237G05 | 2.37 | | | 3 | 18.5 | 19.1 | 55 |
| DSM0238G05 | 2.38 | | | 3 | 18.5 | 19.1 | 55 |
| DSM0239G05 | 2.39 | | | 3 | 18.5 | 19.1 | 55 |
| DSM0240G05 | 2.4 | | ● | 3 | 18.5 | 19.1 | 55 |
| DSM0241G05 | 2.41 | | | 3 | 19.3 | 19.9 | 55 |
| DSM0242G05 | 2.42 | | | 3 | 19.3 | 19.9 | 55 |
| DSM0243G05 | 2.43 | | | 3 | 19.3 | 19.9 | 55 |
| DSM0244G05 | 2.44 | | | 3 | 19.3 | 19.9 | 55 |
| DSM0245G05 | 2.45 | | | 3 | 19.3 | 19.9 | 55 |
| DSM0246G05 | 2.46 | | | 3 | 19.3 | 19.9 | 55 |
| DSM0247G05 | 2.47 | | | 3 | 19.3 | 19.9 | 55 |
| DSM0248G05 | 2.48 | | | 3 | 19.3 | 19.9 | 55 |
| DSM0249G05 | 2.49 | | | 3 | 19.3 | 19.9 | 55 |
| DSM0250G05 | 2.5 | | ● | 3 | 19.3 | 19.9 | 55 |
| DSM0251G05 | 2.51 | | | 3 | 20.1 | 20.7 | 55 |
| DSM0252G05 | 2.52 | | | 3 | 20.1 | 20.7 | 55 |
| DSM0253G05 | 2.53 | | | 3 | 20.1 | 20.7 | 55 |
| DSM0254G05 | 2.54 | | | 3 | 20.1 | 20.7 | 55 |
| DSM0255G05 | 2.55 | | | 3 | 20.1 | 20.7 | 55 |
| DSM0256G05 | 2.56 | | ● | 3 | 20.1 | 20.7 | 55 |
| DSM0257G05 | 2.57 | | | 3 | 20.1 | 20.7 | 55 |
| DSM0258G05 | 2.58 | | | 3 | 20.1 | 20.7 | 55 |
| DSM0259G05 | 2.59 | | | 3 | 20.1 | 20.7 | 55 |
| DSM0260G05 | 2.6 | | ● | 3 | 20.1 | 20.7 | 55 |
| DSM0261G05 | 2.61 | | | 3 | 20.9 | 21.5 | 55 |
| DSM0262G05 | 2.62 | | | 3 | 20.9 | 21.5 | 55 |
| DSM0263G05 | 2.63 | | | 3 | 20.9 | 21.5 | 55 |
| DSM0264G05 | 2.64 | | | 3 | 20.9 | 21.5 | 55 |
| DSM0265G05 | 2.65 | | | 3 | 20.9 | 21.5 | 55 |
| DSM0266G05 | 2.66 | | | 3 | 20.9 | 21.5 | 55 |
| DSM0267G05 | 2.67 | | | 3 | 20.9 | 21.5 | 55 |
| DSM0268G05 | 2.68 | | | 3 | 20.9 | 21.5 | 55 |
| DSM0269G05 | 2.69 | | | 3 | 20.9 | 21.5 | 55 |
| DSM0270G05 | 2.7 | | ● | 3 | 20.9 | 21.5 | 55 |
| DSM0271G05 | 2.71 | | | 3 | 21.7 | 22.3 | 55 |
| DSM0272G05 | 2.72 | | | 3 | 21.7 | 22.3 | 55 |
| DSM0273G05 | 2.73 | | | 3 | 21.7 | 22.3 | 55 |
| DSM0274G05 | 2.74 | | | 3 | 21.7 | 22.3 | 55 |
| DSM0275G05 | 2.75 | | | 3 | 21.7 | 22.3 | 55 |
| DSM0276G05 | 2.76 | | | 3 | 21.7 | 22.3 | 55 |
| DSM0277G05 | 2.77 | | | 3 | 21.7 | 22.3 | 55 |
| DSM0278G05 | 2.78 | | | 3 | 21.7 | 22.3 | 55 |
| DSM0279G05 | 2.79 | | | 3 | 21.7 | 22.3 | 55 |
| DSM0280G05 | 2.8 | | ● | 3 | 21.7 | 22.3 | 55 |
| DSM0281G05 | 2.81 | | | 3 | 22.5 | 23.1 | 55 |
| DSM0282G05 | 2.82 | | | 3 | 22.5 | 23.1 | 55 |
| DSM0283G05 | 2.83 | | | 3 | 22.5 | 23.1 | 55 |
| DSM0284G05 | 2.84 | | | 3 | 22.5 | 23.1 | 55 |
| DSM0285G05 | 2.85 | | | 3 | 22.5 | 23.1 | 55 |
| DSM0286G05 | 2.86 | | | 3 | 22.5 | 23.1 | 55 |
| DSM0287G05 | 2.87 | | | 3 | 22.5 | 23.1 | 55 |
| DSM0288G05 | 2.88 | | | 3 | 22.5 | 23.1 | 55 |
| DSM0289G05 | 2.89 | | | 3 | 22.5 | 23.1 | 55 |
| DSM0290G05 | 2.9 | | ● | 3 | 22.5 | 23.1 | 55 |
| DSM0291G05 | 2.91 | | | 3 | 23.3 | 23.9 | 55 |
| DSM0292G05 | 2.92 | | | 3 | 23.3 | 23.9 | 55 |
| DSM0293G05 | 2.93 | | | 3 | 23.3 | 23.9 | 55 |
| DSM0294G05 | 2.94 | | | 3 | 23.3 | 23.9 | 55 |
| DSM0295G05 | 2.95 | | | 3 | 23.3 | 23.9 | 55 |
| DSM0296G05 | 2.96 | | | 3 | 23.3 | 23.9 | 55 |
| DSM0297G05 | 2.97 | | | 3 | 23.3 | 23.9 | 55 |
| DSM0298G05 | 2.98 | | | 3 | 23.3 | 23.9 | 55 |
| DSM0299G05 | 2.99 | | | 3 | 23.3 | 23.9 | 55 |
| DSM0300G05 | 3 | | ● | 3 | 23.3 | 23.9 | 55 |

## STANDARD CUTTING CONDITIONS

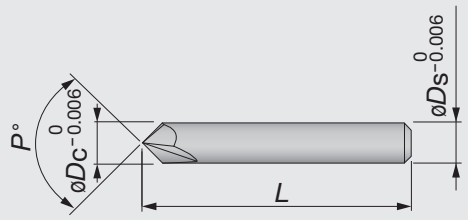
| ISO | Workpiece material | Cutting speed: *Vc* (m/min) | | | Feed: *f* (mm/rev) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | ø0.1 ~ ø0.3 | ø0.3 ~ ø0.5 | ø0.5 ~ ø3 | ø0.1 ~ ø0.3 | ø0.3 ~ ø0.5 | ø0.5 ~ ø1 | ø1 ~ ø2 | ø2 ~ ø3 |
| P | Carbon and alloy steels | 5 - 20 | 15 - 30 | 25 - 60 | 0.001 - 0.004 | 0.002 - 0.01 | 0.005 - 0.05 | 0.03 - 0.09 | 0.05 - 0.1 |
| M | Stainless steels | 2 - 12 | 6 - 18 | 10 - 20 | 0.0005 - 0.004 | 0.002 - 0.008 | 0.005 - 0.03 | 0.01 - 0.04 | 0.02 - 0.05 |
| K | Grey cast irons | 5 - 15 | 10 - 25 | 20 - 50 | 0.0005 - 0.004 | 0.002- 0.012 | 0.005 - 0.03 | 0.01 - 0.06 | 0.03 - 0.12 |
| | Ductile cast irons | 5 - 15 | 10 - 25 | 20 - 50 | 0.001 - 0.003 | 0.002 - 0.01 | 0.005 - 0.02 | 0.01 - 0.05 | 0.03 - 0.1 |
| N | Aluminium alloys | 10 - 20 | 10 - 30 | 20 - 50 | 0.001 - 0.01 | 0.005 - 0.03 | 0.01 - 0.05 | 0.04 - 0.15 | 0.06 - 0.2 |
| | Copper / Brass | 10 - 20 | 10 - 30 | 20 - 50 | 0.001 - 0.01 | 0.005 - 0.03 | 0.01 - 0.05 | 0.04 - 0.15 | 0.06 - 0.2 |
| S | Heat-resistant alloys | 2 - 6 | 5 - 10 | 8 - 20 | 0.0005 - 0.003 | 0.002 - 0.004 | 0.002 - 0.004 | 0.002 - 0.004 | Not recommended |
| H | High hardened steels | 4 - 8 | 6 - 10 | 6 - 16 | 0.0005 - 0.002 | 0.001 - 0.005 | 0.005 - 0.02 | 0.01 - 0.03 | 0.02 - 0.06 |

Note:
- When the drilling depth is deeper than L/D = 5, use drill pecking every 10 to 50% of the drill diameter.
- The above cutting conditions are applied to when a water soluble cutting fluid is used. For drilling a hole smaller than ø0.3 mm, use of a starting drill is recommended.
- When setting the drill, the drill run out should be within 0.002 mm on the taper. (Especially for the drill diameter smaller than ø0.5 mm)

# GIGAMINIDRILL

## DSM-CP

Centering drill for DSM




| Designation | øDc | YH170 | øDs | L | P° |
|---|---|---|---|---|---|
| DSM-CP90 | 3 | ● | 3 | 38.1 | 90 |
| DSM-CP140 | 3 | ● | 3 | 38.1 | 140 |

● : Line-up

## STANDARD CUTTING CONDITIONS

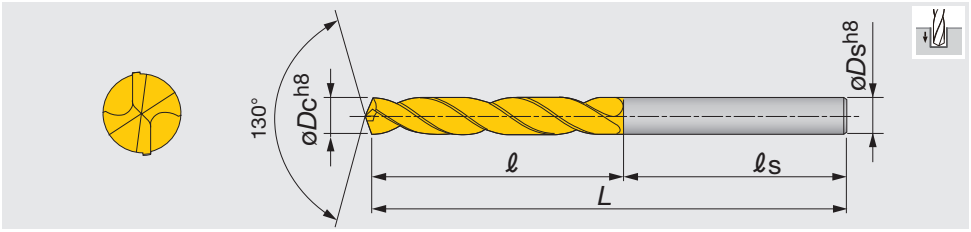
| ISO | Workpiece material | Cutting speed: Vc (m/min) | Feed: f (mm/rev) | |
|---|---|---|---|---|
| | | | DSM-CP90 | DSM-CP140 |
| P | Carbon, Mild and Alloy steels | 30 - 80 | 0.01 - 0.06 | 0.03 - 0.08 |
| K | Grey and ductile cast irons | 30 - 80 | 0.02 - 0.06 | 0.05 - 0.1 |
| N | Aluminium alloys | 60 - 120 | 0.02 - 0.1 | 0.05 - 0.15 |
| M | Stainless steels | 15 - 40 | 0.01 - 0.03 | 0.02 - 0.06 |
| H | High hardened steels (~45HRC) | 10 - 40 | Not recommended | 0.01 - 0.05 |

Notes: • For hard materials and stainless steels which have work-hardening nature, DSM-CP140 is recommended.
• Above cutting conditions are of using a water-soluble cutting fluid. When using a water-insoluble type, set the cutting speed to lower side.

## DMX L/D=2 (S type)

Soliddrill with 130° point angle without oil hole & shank size as diameter, L/D = 2, dia = ø3 - ø20 mm






| Designation | øDc | AH170 | øDs | ℓ | ℓs | L |
|---|---|---|---|---|---|---|
| DMX030S | 3 | ● | 3 | 16 | 30 | 46 |
| DMX031S | 3.1 | ● | 3.1 | 18 | 31 | 49 |
| DMX032S | 3.2 | ● | 3.2 | 18 | 31 | 49 |
| DMX033S | 3.3 | ● | 3.3 | 18 | 31 | 49 |
| DMX034S | 3.4 | ● | 3.4 | 20 | 32 | 52 |
| DMX035S | 3.5 | ● | 3.5 | 20 | 32 | 52 |
| DMX036S | 3.6 | ● | 3.6 | 20 | 32 | 52 |
| DMX037S | 3.7 | ● | 3.7 | 20 | 32 | 52 |
| DMX038S | 3.8 | ● | 3.8 | 22 | 33 | 55 |
| DMX039S | 3.9 | ● | 3.9 | 22 | 33 | 55 |
| DMX040S | 4 | ● | 4 | 22 | 33 | 55 |
| DMX041S | 4.1 | ● | 4.1 | 22 | 33 | 55 |
| DMX042S | 4.2 | ● | 4.2 | 22 | 33 | 55 |
| DMX043S | 4.3 | ● | 4.3 | 24 | 34 | 58 |
| DMX044S | 4.4 | ● | 4.4 | 24 | 34 | 58 |
| DMX045S | 4.5 | ● | 4.5 | 24 | 34 | 58 |
| DMX046S | 4.6 | ● | 4.6 | 24 | 34 | 58 |
| DMX047S | 4.7 | ● | 4.7 | 24 | 34 | 58 |
| DMX048S | 4.8 | ● | 4.8 | 26 | 36 | 62 |
| DMX049S | 4.9 | ● | 4.9 | 26 | 36 | 62 |
| DMX050S | 5 | ● | 5 | 26 | 36 | 62 |
| DMX051S | 5.1 | ● | 5.1 | 26 | 36 | 62 |
| DMX052S | 5.2 | ● | 5.2 | 26 | 36 | 62 |
| DMX053S | 5.3 | ● | 5.3 | 26 | 36 | 62 |
| DMX054S | 5.4 | ● | 5.4 | 28 | 38 | 66 |
| DMX055S | 5.5 | ● | 5.5 | 28 | 38 | 66 |
| DMX056S | 5.6 | ● | 5.6 | 28 | 38 | 66 |
| DMX057S | 5.7 | ● | 5.7 | 28 | 38 | 66 |
| DMX058S | 5.8 | ● | 5.8 | 28 | 38 | 66 |
| DMX059S | 5.9 | ● | 5.9 | 28 | 38 | 66 |
| DMX060S | 6 | ● | 6 | 28 | 38 | 66 |
| DMX061S | 6.1 | ● | 6.1 | 31 | 39 | 70 |
| DMX062S | 6.2 | ● | 6.2 | 31 | 39 | 70 |
| DMX063S | 6.3 | ● | 6.3 | 31 | 39 | 70 |
| DMX064S | 6.4 | ● | 6.4 | 31 | 39 | 70 |
| DMX065S | 6.5 | ● | 6.5 | 31 | 39 | 70 |
| DMX066S | 6.6 | ● | 6.6 | 31 | 39 | 70 |
| DMX067S | 6.7 | ● | 6.7 | 31 | 39 | 70 |
| DMX068S | 6.8 | ● | 6.8 | 34 | 40 | 74 |
| DMX069S | 6.9 | ● | 6.9 | 34 | 40 | 74 |
| DMX070S | 7 | ● | 7 | 34 | 40 | 74 |
| DMX071S | 7.1 | ● | 7.1 | 34 | 40 | 74 |
| DMX072S | 7.2 | ● | 7.2 | 34 | 40 | 74 |
| DMX073S | 7.3 | ● | 7.3 | 34 | 40 | 74 |
| DMX074S | 7.4 | ● | 7.4 | 34 | 40 | 74 |
| DMX075S | 7.5 | ● | 7.5 | 34 | 40 | 74 |
| DMX076S | 7.6 | ● | 7.6 | 37 | 42 | 79 |
| DMX077S | 7.7 | ● | 7.7 | 37 | 42 | 79 |
| DMX078S | 7.8 | ● | 7.8 | 37 | 42 | 79 |
| DMX079S | 7.9 | ● | 7.9 | 37 | 42 | 79 |
| DMX080S | 8 | ● | 8 | 37 | 42 | 79 |
| DMX081S | 8.1 | ● | 8.1 | 37 | 42 | 79 |
| DMX082S | 8.2 | ● | 8.2 | 37 | 42 | 79 |
| DMX083S | 8.3 | ● | 8.3 | 37 | 42 | 79 |
| DMX084S | 8.4 | ● | 8.4 | 37 | 42 | 79 |
| DMX085S | 8.5 | ● | 8.5 | 37 | 42 | 79 |
| DMX086S | 8.6 | ● | 8.6 | 40 | 44 | 84 |
| DMX087S | 8.7 | ● | 8.7 | 40 | 44 | 84 |
| DMX088S | 8.8 | ● | 8.8 | 40 | 44 | 84 |
| DMX089S | 8.9 | ● | 8.9 | 40 | 44 | 84 |
| DMX090S | 9 | ● | 9 | 40 | 44 | 84 |
| DMX091S | 9.1 | ● | 9.1 | 40 | 44 | 84 |
| DMX092S | 9.2 | ● | 9.2 | 40 | 44 | 84 |

| Designation | øDc | AH170 | øDs | ℓ | ℓs | L |
|---|---|---|---|---|---|---|
| DMX093S | 9.3 | ● | 9.3 | 40 | 44 | 84 |
| DMX094S | 9.4 | ● | 9.4 | 40 | 44 | 84 |
| DMX095S | 9.5 | ● | 9.5 | 40 | 44 | 84 |
| DMX096S | 9.6 | ● | 9.6 | 43 | 46 | 89 |
| DMX097S | 9.7 | ● | 9.7 | 43 | 46 | 89 |
| DMX098S | 9.8 | ● | 9.8 | 43 | 46 | 89 |
| DMX099S | 9.9 | ● | 9.9 | 43 | 46 | 89 |
| DMX100S | 10 | ● | 10 | 43 | 46 | 89 |
| DMX101S | 10.1 | ● | 10.1 | 43 | 46 | 89 |
| DMX102S | 10.2 | ● | 10.2 | 43 | 46 | 89 |
| DMX103S | 10.3 | ● | 10.3 | 43 | 46 | 89 |
| DMX104S | 10.4 | ● | 10.4 | 43 | 46 | 89 |
| DMX105S | 10.5 | ● | 10.5 | 43 | 46 | 89 |
| DMX106S | 10.6 | ● | 10.6 | 43 | 46 | 89 |
| DMX107S | 10.7 | ● | 10.7 | 47 | 48 | 95 |
| DMX108S | 10.8 | ● | 10.8 | 47 | 48 | 95 |
| DMX109S | 10.9 | ● | 10.9 | 47 | 48 | 95 |
| DMX110S | 11 | ● | 11 | 47 | 48 | 95 |
| DMX111S | 11.1 | ● | 11.1 | 47 | 48 | 95 |
| DMX112S | 11.2 | ● | 11.2 | 47 | 48 | 95 |
| DMX113S | 11.3 | ● | 11.3 | 47 | 48 | 95 |
| DMX114S | 11.4 | ● | 11.4 | 47 | 48 | 95 |
| DMX115S | 11.5 | ● | 11.5 | 47 | 48 | 95 |
| DMX116S | 11.6 | ● | 11.6 | 47 | 48 | 95 |
| DMX117S | 11.7 | ● | 11.7 | 47 | 48 | 95 |
| DMX118S | 11.8 | ● | 11.8 | 47 | 48 | 95 |
| DMX119S | 11.9 | ● | 11.9 | 51 | 51 | 102 |
| DMX120S | 12 | ● | 12 | 51 | 51 | 102 |
| DMX121S | 12.1 | ● | 12.1 | 51 | 51 | 102 |
| DMX122S | 12.2 | ● | 12.2 | 51 | 51 | 102 |
| DMX123S | 12.3 | ● | 12.3 | 51 | 51 | 102 |
| DMX124S | 12.4 | ● | 12.4 | 51 | 51 | 102 |
| DMX125S | 12.5 | ● | 12.5 | 51 | 51 | 102 |
| DMX126S | 12.6 | ● | 12.6 | 51 | 51 | 102 |
| DMX127S | 12.7 | ● | 12.7 | 51 | 51 | 102 |
| DMX128S | 12.8 | ● | 12.8 | 51 | 51 | 102 |
| DMX129S | 12.9 | ● | 12.9 | 51 | 51 | 102 |
| DMX130S | 13 | ● | 13 | 51 | 51 | 102 |
| DMX131S | 13.1 | ● | 13.1 | 51 | 51 | 102 |
| DMX132S | 13.2 | ● | 13.2 | 51 | 51 | 102 |
| DMX133S | 13.3 | ● | 13.3 | 54 | 53 | 107 |
| DMX134S | 13.4 | ● | 13.4 | 54 | 53 | 107 |
| DMX135S | 13.5 | ● | 13.5 | 54 | 53 | 107 |
| DMX136S | 13.6 | ● | 13.6 | 54 | 53 | 107 |
| DMX137S | 13.7 | ● | 13.7 | 54 | 53 | 107 |
| DMX138S | 13.8 | ● | 13.8 | 54 | 53 | 107 |
| DMX139S | 13.9 | ● | 13.9 | 54 | 53 | 107 |
| DMX140S | 14 | ● | 14 | 54 | 53 | 107 |
| DMX141S | 14.1 | ● | 14.1 | 56 | 55 | 111 |
| DMX142S | 14.2 | ● | 14.2 | 56 | 55 | 111 |
| DMX143S | 14.3 | ● | 14.3 | 56 | 55 | 111 |
| DMX144S | 14.4 | ● | 14.4 | 56 | 55 | 111 |
| DMX145S | 14.5 | ● | 14.5 | 56 | 55 | 111 |
| DMX146S | 14.6 | ● | 14.6 | 56 | 55 | 111 |
| DMX147S | 14.7 | ● | 14.7 | 56 | 55 | 111 |
| DMX148S | 14.8 | ● | 14.8 | 56 | 55 | 111 |
| DMX149S | 14.9 | ● | 14.9 | 56 | 55 | 111 |
| DMX150S | 15 | ● | 15 | 56 | 55 | 111 |
| DMX151S | 15.1 | ● | 15.1 | 58 | 57 | 115 |
| DMX152S | 15.2 | ● | 15.2 | 58 | 57 | 115 |
| DMX153S | 15.3 | ● | 15.3 | 58 | 57 | 115 |
| DMX154S | 15.4 | ● | 15.4 | 58 | 57 | 115 |
| DMX155S | 15.5 | ● | 15.5 | 58 | 57 | 115 |

● : Line-up

| Designation | øDc | AH170 | øDs | ℓ | ℓs | L |
|---|---|---|---|---|---|---|
| DMX156S | 15.6 | ● | 15.6 | 58 | 57 | 115 |
| DMX157S | 15.7 | ● | 15.7 | 58 | 57 | 115 |
| DMX158S | 15.8 | ● | 15.8 | 58 | 57 | 115 |
| DMX159S | 15.9 | ● | 15.9 | 58 | 57 | 115 |
| DMX160S | 16 | ● | 16 | 58 | 57 | 115 |
| DMX165S | 16.5 | ● | 16.5 | 60 | 59 | 119 |
| DMX170S | 17 | ● | 17 | 60 | 59 | 119 |
| DMX175S | 17.5 | ● | 17.5 | 62 | 61 | 123 |
| DMX180S | 18 | ● | 18 | 62 | 61 | 123 |
| DMX185S | 18.5 | ● | 18.5 | 64 | 63 | 127 |
| DMX190S | 19 | ● | 19 | 64 | 63 | 127 |
| DMX195S | 19.5 | ● | 19.5 | 66 | 65 | 131 |
| DMX200S | 20 | ● | 20 | 66 | 65 | 131 |

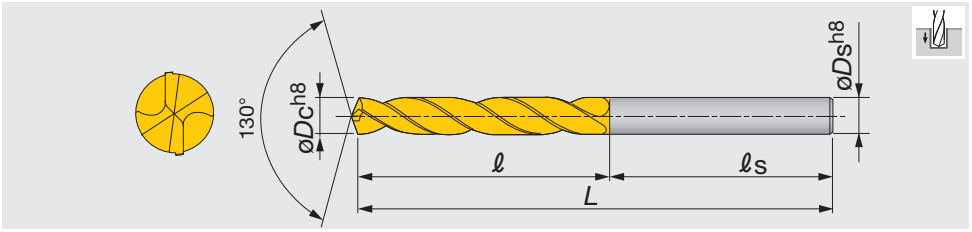
• Cutting fluid should be sufficiently supplied to the drill point and the entrance of the hole.
• Use a water-soluble cutting fluid.

● : Line-up

## DMX L/D=3 (M type)

Soliddrill with 130° point angle without oil hole & shank size same as diameter, L/D = 3, dia = ø3 - ø20 mm






| Designation | øDc | AH170 | øDs | ℓ | ℓs | L |
|---|---|---|---|---|---|---|
| DMX030M | 3 | ● | 3 | 21 | 39 | 60 |
| DMX031M | 3.1 | ● | 3.1 | 24 | 36 | 60 |
| DMX032M | 3.2 | ● | 3.2 | 24 | 36 | 60 |
| DMX033M | 3.3 | ● | 3.3 | 24 | 36 | 60 |
| DMX034M | 3.4 | ● | 3.4 | 24 | 36 | 60 |
| DMX035M | 3.5 | ● | 3.5 | 24 | 36 | 60 |
| DMX036M | 3.6 | ● | 3.6 | 27 | 33 | 60 |
| DMX037M | 3.7 | ● | 3.7 | 27 | 33 | 60 |
| DMX038M | 3.8 | ● | 3.8 | 27 | 33 | 60 |
| DMX039M | 3.9 | ● | 3.9 | 27 | 33 | 60 |
| DMX040M | 4 | ● | 4 | 27 | 33 | 60 |
| DMX041M | 4.1 | ● | 4.1 | 29 | 34 | 63 |
| DMX042M | 4.2 | ● | 4.2 | 29 | 34 | 63 |
| DMX043M | 4.3 | ● | 4.3 | 29 | 34 | 63 |
| DMX044M | 4.4 | ● | 4.4 | 29 | 34 | 63 |
| DMX045M | 4.5 | ● | 4.5 | 29 | 34 | 63 |
| DMX046M | 4.6 | ● | 4.6 | 32 | 36 | 68 |
| DMX047M | 4.7 | ● | 4.7 | 32 | 36 | 68 |
| DMX048M | 4.8 | ● | 4.8 | 32 | 36 | 68 |
| DMX049M | 4.9 | ● | 4.9 | 32 | 36 | 68 |
| DMX050M | 5 | ● | 5 | 32 | 36 | 68 |
| DMX051M | 5.1 | ● | 5.1 | 34 | 38 | 72 |
| DMX052M | 5.2 | ● | 5.2 | 34 | 38 | 72 |
| DMX053M | 5.3 | ● | 5.3 | 34 | 38 | 72 |
| DMX054M | 5.4 | ● | 5.4 | 34 | 38 | 72 |
| DMX055M | 5.5 | ● | 5.5 | 34 | 38 | 72 |
| DMX056M | 5.6 | ● | 5.6 | 36 | 38 | 74 |
| DMX057M | 5.7 | ● | 5.7 | 36 | 38 | 74 |
| DMX058M | 5.8 | ● | 5.8 | 36 | 38 | 74 |
| DMX059M | 5.9 | ● | 5.9 | 36 | 38 | 74 |
| DMX060M | 6 | ● | 6 | 41 | 40 | 81 |
| DMX061M | 6.1 | ● | 6.1 | 41 | 40 | 81 |
| DMX062M | 6.2 | ● | 6.2 | 41 | 40 | 81 |
| DMX063M | 6.3 | ● | 6.3 | 41 | 40 | 81 |
| DMX064M | 6.4 | ● | 6.4 | 41 | 40 | 81 |
| DMX065M | 6.5 | ● | 6.5 | 41 | 40 | 81 |
| DMX066M | 6.6 | ● | 6.6 | 43 | 40 | 83 |
| DMX067M | 6.7 | ● | 6.7 | 43 | 40 | 83 |
| DMX068M | 6.8 | ● | 6.8 | 43 | 40 | 83 |
| DMX069M | 6.9 | ● | 6.9 | 43 | 40 | 83 |
| DMX070M | 7 | ● | 7 | 43 | 40 | 83 |
| DMX071M | 7.1 | ● | 7.1 | 45 | 42 | 87 |
| DMX072M | 7.2 | ● | 7.2 | 45 | 42 | 87 |
| DMX073M | 7.3 | ● | 7.3 | 45 | 42 | 87 |
| DMX074M | 7.4 | ● | 7.4 | 45 | 42 | 87 |
| DMX075M | 7.5 | ● | 7.5 | 45 | 42 | 87 |
| DMX076M | 7.6 | ● | 7.6 | 48 | 42 | 90 |
| DMX077M | 7.7 | ● | 7.7 | 48 | 42 | 90 |
| DMX078M | 7.8 | ● | 7.8 | 48 | 42 | 90 |
| DMX079M | 7.9 | ● | 7.9 | 48 | 42 | 90 |
| DMX080M | 8 | ● | 8 | 48 | 42 | 90 |
| DMX081M | 8.1 | ● | 8.1 | 53 | 43 | 96 |
| DMX082M | 8.2 | ● | 8.2 | 53 | 43 | 96 |
| DMX083M | 8.3 | ● | 8.3 | 53 | 43 | 96 |
| DMX084M | 8.4 | ● | 8.4 | 53 | 43 | 96 |
| DMX085M | 8.5 | ● | 8.5 | 53 | 43 | 96 |
| DMX086M | 8.6 | ● | 8.6 | 55 | 43 | 98 |
| DMX087M | 8.7 | ● | 8.7 | 55 | 43 | 98 |
| DMX088M | 8.8 | ● | 8.8 | 55 | 43 | 98 |
| DMX089M | 8.9 | ● | 8.9 | 55 | 43 | 98 |
| DMX090M | 9 | ● | 9 | 55 | 43 | 98 |
| DMX091M | 9.1 | ● | 9.1 | 58 | 44 | 102 |
| DMX092M | 9.2 | ● | 9.2 | 58 | 44 | 102 |

| Designation | øDc | AH170 | øDs | ℓ | ℓs | L |
|---|---|---|---|---|---|---|
| DMX093M | 9.3 | ● | 9.3 | 58 | 44 | 102 |
| DMX094M | 9.4 | ● | 9.4 | 58 | 44 | 102 |
| DMX095M | 9.5 | ● | 9.5 | 58 | 44 | 102 |
| DMX096M | 9.6 | ● | 9.6 | 60 | 45 | 105 |
| DMX097M | 9.7 | ● | 9.7 | 60 | 45 | 105 |
| DMX098M | 9.8 | ● | 9.8 | 60 | 45 | 105 |
| DMX099M | 9.9 | ● | 9.9 | 60 | 45 | 105 |
| DMX100M | 10 | ● | 10 | 60 | 45 | 105 |
| DMX101M | 10.1 | ● | 10.1 | 66 | 46 | 112 |
| DMX102M | 10.2 | ● | 10.2 | 66 | 46 | 112 |
| DMX103M | 10.3 | ● | 10.3 | 66 | 46 | 112 |
| DMX104M | 10.4 | ● | 10.4 | 66 | 46 | 112 |
| DMX105M | 10.5 | ● | 10.5 | 66 | 46 | 112 |
| DMX106M | 10.6 | ● | 10.6 | 68 | 46 | 114 |
| DMX107M | 10.7 | ● | 10.7 | 68 | 46 | 114 |
| DMX108M | 10.8 | ● | 10.8 | 68 | 46 | 114 |
| DMX109M | 10.9 | ● | 10.9 | 68 | 46 | 114 |
| DMX110M | 11 | ● | 11 | 68 | 46 | 114 |
| DMX111M | 11.1 | ● | 11.1 | 71 | 47 | 118 |
| DMX112M | 11.2 | ● | 11.2 | 71 | 47 | 118 |
| DMX113M | 11.3 | ● | 11.3 | 71 | 47 | 118 |
| DMX114M | 11.4 | ● | 11.4 | 71 | 47 | 118 |
| DMX115M | 11.5 | ● | 11.5 | 71 | 47 | 118 |
| DMX116M | 11.6 | ● | 11.6 | 73 | 48 | 121 |
| DMX117M | 11.7 | ● | 11.7 | 73 | 48 | 121 |
| DMX118M | 11.8 | ● | 11.8 | 73 | 48 | 121 |
| DMX119M | 11.9 | ● | 11.9 | 73 | 48 | 121 |
| DMX120M | 12 | ● | 12 | 73 | 48 | 121 |
| DMX121M | 12.1 | ● | 12.1 | 76 | 59 | 135 |
| DMX122M | 12.2 | ● | 12.2 | 76 | 59 | 135 |
| DMX123M | 12.3 | ● | 12.3 | 76 | 59 | 135 |
| DMX124M | 12.4 | ● | 12.4 | 76 | 59 | 135 |
| DMX125M | 12.5 | ● | 12.5 | 76 | 59 | 135 |
| DMX126M | 12.6 | ● | 12.6 | 78 | 59 | 137 |
| DMX127M | 12.7 | ● | 12.7 | 78 | 59 | 137 |
| DMX128M | 12.8 | ● | 12.8 | 78 | 59 | 137 |
| DMX129M | 12.9 | ● | 12.9 | 78 | 59 | 137 |
| DMX130M | 13 | ● | 13 | 78 | 59 | 137 |
| DMX131M | 13.1 | ● | 13.1 | 84 | 60 | 144 |
| DMX132M | 13.2 | ● | 13.2 | 84 | 60 | 144 |
| DMX133M | 13.3 | ● | 13.3 | 84 | 60 | 144 |
| DMX134M | 13.4 | ● | 13.4 | 84 | 60 | 144 |
| DMX135M | 13.5 | ● | 13.5 | 84 | 60 | 144 |
| DMX136M | 13.6 | ● | 13.6 | 86 | 61 | 147 |
| DMX137M | 13.7 | ● | 13.7 | 86 | 61 | 147 |
| DMX138M | 13.8 | ● | 13.8 | 86 | 61 | 147 |
| DMX139M | 13.9 | ● | 13.9 | 86 | 61 | 147 |
| DMX140M | 14 | ● | 14 | 86 | 61 | 147 |
| DMX141M | 14.1 | ● | 14.1 | 89 | 62 | 151 |
| DMX142M | 14.2 | ● | 14.2 | 89 | 62 | 151 |
| DMX143M | 14.3 | ● | 14.3 | 89 | 62 | 151 |
| DMX144M | 14.4 | ● | 14.4 | 89 | 62 | 151 |
| DMX145M | 14.5 | ● | 14.5 | 89 | 62 | 151 |
| DMX146M | 14.6 | ● | 14.6 | 91 | 62 | 153 |
| DMX147M | 14.7 | ● | 14.7 | 91 | 62 | 153 |
| DMX148M | 14.8 | ● | 14.8 | 91 | 62 | 153 |
| DMX149M | 14.9 | ● | 14.9 | 91 | 62 | 153 |
| DMX150M | 15 | ● | 15 | 91 | 62 | 153 |
| DMX151M | 15.1 | ● | 15.1 | 94 | 63 | 157 |
| DMX152M | 15.2 | ● | 15.2 | 94 | 63 | 157 |
| DMX153M | 15.3 | ● | 15.3 | 94 | 63 | 157 |
| DMX154M | 15.4 | ● | 15.4 | 94 | 63 | 157 |
| DMX155M | 15.5 | ● | 15.5 | 94 | 63 | 157 |

● : Line-up

| Designation | øDc | AH170 | øDs | ℓ | ℓs | L |
|---|---|---|---|---|---|---|
| DMX156M | 15.6 | ● | 15.6 | 96 | 64 | 160 |
| DMX157M | 15.7 | ● | 15.7 | 96 | 64 | 160 |
| DMX158M | 15.8 | ● | 15.8 | 96 | 64 | 160 |
| DMX159M | 15.9 | ● | 15.9 | 96 | 64 | 160 |
| DMX160M | 16 | ● | 16 | 96 | 64 | 160 |
| DMX165M | 16.5 | ● | 16.5 | 102 | 65 | 167 |
| DMX170M | 17 | ● | 17 | 102 | 65 | 167 |
| DMX175M | 17.5 | ● | 17.5 | 102 | 65 | 167 |
| DMX180M | 18 | ● | 18 | 102 | 65 | 167 |
| DMX185M | 18.5 | ● | 18.5 | 114 | 65 | 179 |
| DMX190M | 19 | ● | 19 | 114 | 65 | 179 |
| DMX195M | 19.5 | ● | 19.5 | 114 | 65 | 179 |
| DMX200M | 20 | ● | 20 | 114 | 65 | 179 |

• Cutting fluid should be sufficiently supplied to the drill point and the entrance of the hole.
• Use a water-soluble cutting fluid.
● : Line-up

## STANDARD CUTTING CONDITIONS

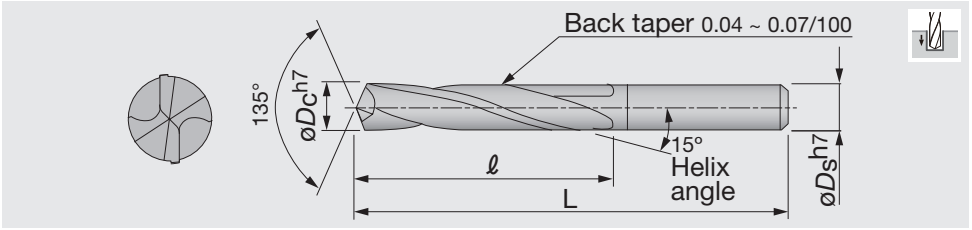
| ISO | Workpiece material | Examples (JIS) | Hardness | Cutting speed Vc (m/min) | Feed: f (mm/rev) ø3 ~ ø5 | ø5 ~ ø10 | ø10 ~ ø16 | ø16 ~ ø20 |
|---|---|---|---|---|---|---|---|---|
| P | Mild steels· Low Carbon steels | E275A | < 180HB | 40 - 80 | 0.15 - 0.25 | 0.15 - 0.3 | 0.2 - 0.4 | 0.25 - 0.5 |
| P | Carbon steels · Alloy steels | C55 | 180 ~ 300HB | 40 - 80 | 0.15 - 0.25 | 0.15 - 0.3 | 0.2 - 0.4 | 0.25 - 0.5 |
| P | High alloy steets etc. | 42CrMo4 | 250 ~ 350HB | 40 - 70 | 0.1 - 0.2 | 0.15 - 0.25 | 0.15 - 0.3 | 0.2 - 0.4 |
| M | Stainless steels | X5CrNi18-9 | < 200HB | 20 - 40 | 0.05 - 0.2 | 0.1 - 0.25 | 0.1 - 0.3 | 0.15 - 0.3 |
| K | Grey cast irons | 300 | < 300HB | 40 - 80 | 0.15 - 0.35 | 0.25 - 0.45 | 0.3 - 0.6 | 0.35 - 0.65 |
| K | Ductile cast irons | 600-3 | < 300HB | 40 - 80 | 0.15 - 0.3 | 0.2 - 0.4 | 0.25 - 0.5 | 0.3 - 0.6 |
| S | Titanium alloys | Ti-6Al-4V | | 20 - 40 | 0.1- 0.2 | 0.15 - 0.25 | 0.15 - 0.3 | 0.2 - 0.4 |
| S | Heat-resistant alloys | Inconel | 250HB < | 10 - 30 | 0.03 - 0.07 | 0.05 - 0.1 | 0.07 - 0.12 | 0.07 - 0.12 |
| H | High hardened steels | X153CrMoV12 | < 45HRC | 10 - 30 | 0.03 - 0.07 | 0.05 - 0.1 | 0.07 - 0.12 | 0.07 - 0.12 |

Note:
• Because the cutting conditions may be changed depending on the material type, hardness, machinability, machine tool, and coolant, the most appropriate conditions must be decided whilst referring the chip control condition and tool failure mode.
• When using the smaller side of the diameter range, the feed rate should be set lower.
• When drilling difficult-to-cut materials, coolant supplying conditions are critical for successful drilling. So, the use of constant and flood coolant is highly recommended.
• For the standard DMX-type drills, somewhat large honing width intended for drilling of general steels is applied. But, when drilling difficult-to-cut materials having high hardness, requiring lowering the feed rate, the honing width should be modified.
• The drills with special honing specification are made to order on request.
• Inconel is trademark of Huntington Alloys, Inc.

## DMD-S

For hardened material drilling soliddrill with 135° point angle and 15° helix angle, without oil hole






### L/D = 3

| Designation | øDc | EM10 | ℓ | L |
|---|---|---|---|---|
| DMD-006S | 0.6 | | 5 | 40 |
| DMD-007S | 0.7 | | 6 | 40 |
| DMD-008S | 0.8 | | 6 | 40 |
| DMD-009S | 0.9 | ● | 6 | 40 |
| DMD-010S | 1 | ● | 6 | 40 |
| DMD-011S | 1.1 | | 6 | 40 |
| DMD-012S | 1.2 | | 8 | 40 |
| DMD-013S | 1.3 | | 8 | 40 |
| DMD-014S | 1.4 | | 9 | 40 |
| DMD-015S | 1.5 | | 9 | 40 |
| DMD-016S | 1.6 | | 10 | 50 |
| DMD-017S | 1.7 | | 10 | 50 |
| DMD-018S | 1.8 | | 11 | 50 |
| DMD-019S | 1.9 | | 11 | 50 |
| DMD-020S | 2 | | 12 | 50 |
| DMD-021S | 2.1 | | 12 | 50 |
| DMD-022S | 2.2 | | 13 | 50 |
| DMD-023S | 2.3 | | 13 | 50 |
| DMD-024S | 2.4 | | 14 | 50 |
| DMD-025S | 2.5 | | 14 | 50 |
| DMD-026S | 2.6 | | 14 | 50 |
| DMD-027S | 2.7 | | 16 | 50 |
| DMD-028S | 2.8 | | 16 | 50 |
| DMD-029S | 2.9 | | 16 | 50 |
| DMD-030S | 3 | ● | 16 | 50 |
| DMD-031S | 3.1 | | 18 | 55 |
| DMD-032S | 3.2 | | 18 | 55 |
| DMD-033S | 3.3 | | 18 | 55 |
| DMD-034S | 3.4 | | 20 | 55 |
| DMD-035S | 3.5 | | 20 | 55 |
| DMD-036S | 3.6 | | 20 | 55 |
| DMD-037S | 3.7 | | 22 | 55 |
| DMD-038S | 3.8 | | 22 | 55 |
| DMD-039S | 3.9 | | 22 | 55 |
| DMD-040S | 4 | | 22 | 55 |
| DMD-041S | 4.1 | | 23 | 60 |
| DMD-042S | 4.2 | | 23 | 60 |
| DMD-043S | 4.3 | | 23 | 60 |
| DMD-044S | 4.4 | | 23 | 60 |
| DMD-045S | 4.5 | | 25 | 60 |
| DMD-046S | 4.6 | | 25 | 60 |
| DMD-047S | 4.7 | | 25 | 60 |
| DMD-048S | 4.8 | | 27 | 60 |
| DMD-049S | 4.9 | | 27 | 60 |
| DMD-050S | 5 | | 27 | 60 |
| DMD-051S | 5.1 | | 28 | 65 |
| DMD-052S | 5.2 | | 28 | 65 |
| DMD-053S | 5.3 | | 28 | 65 |
| DMD-054S | 5.4 | | 30 | 65 |
| DMD-055S | 5.5 | | 30 | 65 |
| DMD-056S | 5.6 | | 32 | 65 |
| DMD-057S | 5.7 | | 32 | 65 |
| DMD-058S | 5.8 | | 35 | 65 |
| DMD-059S | 5.9 | | 35 | 65 |
| DMD-060S | 6 | | 35 | 65 |
| DMD-061S | 6.1 | | 38 | 70 |
| DMD-062S | 6.2 | | 38 | 70 |
| DMD-063S | 6.3 | | 38 | 70 |
| DMD-064S | 6.4 | | 38 | 70 |
| DMD-065S | 6.5 | | 38 | 70 |
| DMD-066S | 6.6 | | 38 | 70 |
| DMD-067S | 6.7 | | 38 | 70 |
| DMD-068S | 6.8 | | 38 | 70 |

| Designation | øDc | EM10 | ℓ | L |
|---|---|---|---|---|
| DMD-069S | 6.9 | | 38 | 70 |
| DMD-070S | 7 | | 38 | 70 |
| DMD-071S | 7.1 | | 40 | 75 |
| DMD-072S | 7.2 | | 40 | 75 |
| DMD-073S | 7.3 | | 40 | 75 |
| DMD-074S | 7.4 | | 40 | 75 |
| DMD-075S | 7.5 | | 40 | 75 |
| DMD-076S | 7.6 | | 45 | 80 |
| DMD-077S | 7.7 | | 45 | 80 |
| DMD-078S | 7.8 | | 45 | 80 |
| DMD-079S | 7.9 | | 45 | 80 |
| DMD-080S | 8 | | 45 | 80 |
| DMD-081S | 8.1 | | 50 | 85 |
| DMD-082S | 8.2 | | 50 | 85 |
| DMD-083S | 8.3 | | 50 | 85 |
| DMD-084S | 8.4 | | 50 | 85 |
| DMD-085S | 8.5 | | 50 | 85 |
| DMD-086S | 8.6 | | 50 | 85 |
| DMD-087S | 8.7 | | 50 | 85 |
| DMD-088S | 8.8 | | 50 | 85 |
| DMD-089S | 8.9 | | 50 | 85 |
| DMD-090S | 9 | | 55 | 90 |
| DMD-091S | 9.1 | | 55 | 90 |
| DMD-092S | 9.2 | | 55 | 90 |
| DMD-093S | 9.3 | | 55 | 90 |
| DMD-094S | 9.4 | | 55 | 90 |
| DMD-095S | 9.5 | | 55 | 90 |
| DMD-096S | 9.6 | | 55 | 90 |
| DMD-097S | 9.7 | | 55 | 90 |
| DMD-098S | 9.8 | | 55 | 90 |
| DMD-099S | 9.9 | | 55 | 90 |
| DMD-100S | 10 | | 60 | 100 |
| DMD-101S | 10.1 | | 60 | 100 |
| DMD-102S | 10.2 | | 60 | 100 |
| DMD-103S | 10.3 | | 60 | 100 |
| DMD-104S | 10.4 | | 60 | 100 |
| DMD-105S | 10.5 | | 60 | 100 |
| DMD-106S | 10.6 | | 60 | 100 |
| DMD-107S | 10.7 | | 60 | 100 |
| DMD-108S | 10.8 | | 60 | 100 |
| DMD-109S | 10.9 | | 60 | 100 |
| DMD-110S | 11 | | 70 | 110 |
| DMD-111S | 11.1 | | 70 | 110 |
| DMD-112S | 11.2 | | 70 | 110 |
| DMD-113S | 11.3 | | 70 | 110 |
| DMD-114S | 11.4 | | 70 | 110 |
| DMD-115S | 11.5 | | 70 | 110 |
| DMD-116S | 11.6 | | 70 | 110 |
| DMD-117S | 11.7 | | 70 | 110 |
| DMD-118S | 11.8 | | 70 | 110 |
| DMD-119S | 11.9 | | 70 | 110 |
| DMD-120S | 12 | | 80 | 120 |
| DMD-121S | 12.1 | | 80 | 120 |
| DMD-122S | 12.2 | | 80 | 120 |
| DMD-123S | 12.3 | | 80 | 120 |
| DMD-124S | 12.4 | | 80 | 120 |
| DMD-125S | 12.5 | | 80 | 120 |
| DMD-126S | 12.6 | | 80 | 120 |
| DMD-127S | 12.7 | | 80 | 120 |
| DMD-128S | 12.8 | | 80 | 120 |
| DMD-129S | 12.9 | | 80 | 120 |
| DMD-130S | 13 | | 90 | 130 |

● : Line-up

| øDc | Tool diameter tolerance h7(mm) |
|---|---|
| øDc ≤ 3 | 0 ~ -0.01 |
| 3 < øDc ≤ 6 | 0 ~ -0.012 |
| 6 < øDc ≤ 10 | 0 ~ -0.015 |
| 10 < øDc ≤ 13 | 0 ~ -0.018 |

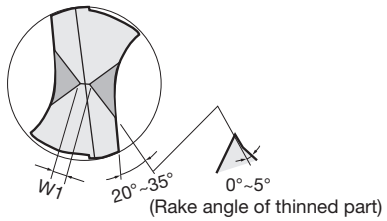
## CAUTIONARY POINTS IN USE

- The standard cutting conditions are only the general guidelines. When using on a low rigidity drilling machine, using a small diameter drill, or drilling a hard material, the cutting speed and feed rate should be set lower.
- Cutting edges should be honed as follows:
  Honing width: 0.02 to 0.05 mm
  Honing angle: - 20° to - 30°

## CAUTIONARY POINTS IN REGRINDING

- Regrinding must be carried out before the corner wear reaches the same as the margin width.
- Use of a diamond wheel (#200 to #400) is recommended. Avoid use of a silicon carbide wheel and hand grinding.
- Thin the drill point. Cross thinning shown in the figure below is recommended. The recommended thinning width (W1) is 1/3 to 1/4 times the web thickness. In this case, too sharp thinned edge may cause drill breakage.

Thinning for DMD-S drills




(Rake angle of thinned part)

## STANDARD CUTTING CONDITIONS

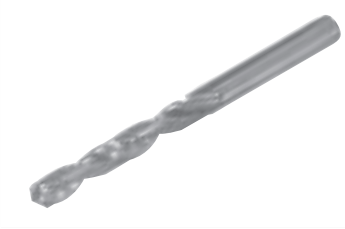
| ISO | Workpiece material | Cutting speed: *Vc* (m/min) | Feed: *f* (mm/rev) |
|---|---|---|---|
| H | Hardened steels (< 50HRC) | 8 - 18 | 0.02 - 0.1 |
| H | Hardened steels (> 50HRC) | 3 - 9 | 0.01 - 0.06 |
| P | High-manganese steels | 8 - 12 | 0.03 - 0.1 |
| S | Inconel | 10 - 20 | 0.02 - 0.08 |
| K | Chilld cast irons | 8 - 12 | 0.02 - 0.08 |

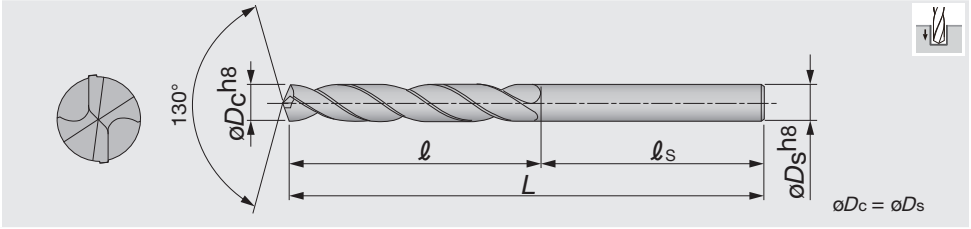
• No. of revolutions ($min^{-1}$) = Cutting speed × 1000 ÷ 3.14 ÷ Tool diameter
• Table feed (mm/min) = No. of revolutions × Feed per revolution

## DMX-F

Soliddrill for aluminum and cast iron drilling, without oil hole & shank size same as diameter

### L/D = 2 (S type)






| Designation | øDc | MD20 | ℓ | ℓs | L |
|---|---|---|---|---|---|
| DMX0300FS | 3 | ● | 16 | 30 | 46 |
| DMX0310FS | 3.1 | | 18 | 31 | 49 |
| DMX0320FS | 3.2 | | 18 | 31 | 49 |
| DMX0330FS | 3.3 | | 18 | 31 | 49 |
| DMX0340FS | 3.4 | ● | 20 | 32 | 52 |
| DMX0350FS | 3.5 | ● | 20 | 32 | 52 |
| DMX0360FS | 3.6 | | 20 | 32 | 52 |
| DMX0370FS | 3.7 | | 20 | 32 | 52 |
| DMX0380FS | 3.8 | | 22 | 33 | 55 |
| DMX0390FS | 3.9 | | 22 | 33 | 55 |
| DMX0400FS | 4 | ● | 22 | 33 | 55 |
| DMX0410FS | 4.1 | | 22 | 33 | 55 |
| DMX0420FS | 4.2 | | 22 | 33 | 55 |
| DMX0430FS | 4.3 | ● | 24 | 34 | 58 |
| DMX0440FS | 4.4 | | 24 | 34 | 58 |
| DMX0450FS | 4.5 | ● | 24 | 34 | 58 |
| DMX0460FS | 4.6 | | 24 | 34 | 58 |
| DMX0470FS | 4.7 | | 24 | 34 | 58 |
| DMX0480FS | 4.8 | | 26 | 34 | 62 |
| DMX0490FS | 4.9 | | 26 | 34 | 62 |
| DMX0500FS | 5 | ● | 26 | 34 | 62 |
| DMX0510FS | 5.1 | ● | 26 | 34 | 62 |
| DMX0520FS | 5.2 | | 26 | 34 | 62 |
| DMX0530FS | 5.3 | | 26 | 34 | 62 |
| DMX0540FS | 5.4 | | 28 | 38 | 66 |
| DMX0550FS | 5.5 | ● | 28 | 38 | 66 |
| DMX0560FS | 5.6 | | 28 | 38 | 66 |
| DMX0570FS | 5.7 | | 28 | 38 | 66 |
| DMX0580FS | 5.8 | | 28 | 38 | 66 |
| DMX0590FS | 5.9 | | 28 | 38 | 66 |
| DMX0600FS | 6 | ● | 28 | 38 | 66 |
| DMX0610FS | 6.1 | | 31 | 39 | 70 |
| DMX0620FS | 6.2 | | 31 | 39 | 70 |
| DMX0630FS | 6.3 | | 31 | 39 | 70 |
| DMX0640FS | 6.4 | | 31 | 39 | 70 |
| DMX0650FS | 6.5 | ● | 31 | 39 | 70 |
| DMX0660FS | 6.6 | | 31 | 39 | 70 |
| DMX0670FS | 6.7 | | 31 | 39 | 70 |
| DMX0680FS | 6.8 | ● | 34 | 40 | 74 |
| DMX0690FS | 6.9 | | 34 | 40 | 74 |
| DMX0700FS | 7 | ● | 34 | 40 | 74 |
| DMX0710FS | 7.1 | | 34 | 40 | 74 |
| DMX0720FS | 7.2 | | 34 | 40 | 74 |
| DMX0730FS | 7.3 | ● | 34 | 40 | 74 |
| DMX0740FS | 7.4 | | 34 | 40 | 74 |
| DMX0750FS | 7.5 | ● | 34 | 40 | 74 |
| DMX0760FS | 7.6 | | 37 | 42 | 79 |
| DMX0770FS | 7.7 | | 37 | 42 | 79 |
| DMX0780FS | 7.8 | | 37 | 42 | 79 |
| DMX0790FS | 7.9 | | 37 | 42 | 79 |
| DMX0800FS | 8 | ● | 37 | 42 | 79 |
| DMX0810FS | 8.1 | | 37 | 42 | 79 |
| DMX0820FS | 8.2 | | 37 | 42 | 79 |

| Designation | øDc | MD20 | ℓ | ℓs | L |
|---|---|---|---|---|---|
| DMX0830FS | 8.3 | | 37 | 42 | 79 |
| DMX0840FS | 8.4 | | 37 | 42 | 79 |
| DMX0850FS | 8.5 | ● | 37 | 42 | 79 |
| DMX0860FS | 8.6 | ● | 40 | 44 | 84 |
| DMX0870FS | 8.7 | | 40 | 44 | 84 |
| DMX0880FS | 8.8 | ● | 40 | 44 | 84 |
| DMX0890FS | 8.9 | | 40 | 44 | 84 |
| DMX0900FS | 9 | ● | 40 | 44 | 84 |
| DMX0910FS | 9.1 | | 40 | 44 | 84 |
| DMX0920FS | 9.2 | | 40 | 44 | 84 |
| DMX0930FS | 9.3 | | 40 | 44 | 84 |
| DMX0940FS | 9.4 | | 40 | 44 | 84 |
| DMX0950FS | 9.5 | ● | 40 | 44 | 84 |
| DMX0960FS | 9.6 | ● | 43 | 46 | 89 |
| DMX0970FS | 9.7 | | 43 | 46 | 89 |
| DMX0980FS | 9.8 | | 43 | 46 | 89 |
| DMX0990FS | 9.9 | | 43 | 46 | 89 |
| DMX1000FS | 10 | ● | 43 | 46 | 89 |
| DMX1010FS | 10.1 | | 43 | 46 | 89 |
| DMX1020FS | 10.2 | | 43 | 46 | 89 |
| DMX1030FS | 10.3 | ● | 43 | 46 | 89 |
| DMX1040FS | 10.4 | | 43 | 46 | 89 |
| DMX1050FS | 10.5 | ● | 43 | 46 | 89 |
| DMX1060FS | 10.6 | | 43 | 46 | 89 |
| DMX1070FS | 10.7 | | 47 | 48 | 95 |
| DMX1080FS | 10.8 | | 47 | 48 | 95 |
| DMX1090FS | 10.9 | | 47 | 48 | 95 |
| DMX1100FS | 11 | ● | 47 | 48 | 95 |
| DMX1110FS | 11.1 | | 47 | 48 | 95 |
| DMX1120FS | 11.2 | | 47 | 48 | 95 |
| DMX1130FS | 11.3 | | 47 | 48 | 95 |
| DMX1140FS | 11.4 | | 47 | 48 | 95 |
| DMX1150FS | 11.5 | ● | 47 | 48 | 95 |
| DMX1160FS | 11.6 | | 47 | 48 | 95 |
| DMX1170FS | 11.7 | | 47 | 48 | 95 |
| DMX1180FS | 11.8 | | 47 | 48 | 95 |
| DMX1190FS | 11.9 | | 51 | 51 | 102 |
| DMX1200FS | 12 | ● | 51 | 51 | 102 |
| DMX1210FS | 12.1 | | 51 | 51 | 102 |
| DMX1220FS | 12.2 | | 51 | 51 | 102 |
| DMX1230FS | 12.3 | | 51 | 51 | 102 |
| DMX1240FS | 12.4 | | 51 | 51 | 102 |
| DMX1250FS | 12.5 | ● | 51 | 51 | 102 |
| DMX1260FS | 12.6 | | 51 | 51 | 102 |
| DMX1270FS | 12.7 | | 51 | 51 | 102 |
| DMX1280FS | 12.8 | | 51 | 51 | 102 |
| DMX1290FS | 12.9 | | 51 | 51 | 102 |
| DMX1300FS | 13 | ● | 51 | 51 | 102 |
| DMX1310FS | 13.1 | | 51 | 51 | 102 |
| DMX1320FS | 13.2 | | 51 | 51 | 102 |
| DMX1330FS | 13.3 | | 54 | 53 | 107 |
| DMX1340FS | 13.4 | | 54 | 53 | 107 |
| DMX1350FS | 13.5 | ● | 54 | 53 | 107 |

● : Line-up

## L/D = 2 (S type)

| Designation | øDc | MD20 | ℓ | ℓs | L |
|---|---|---|---|---|---|
| DMX1360FS | 13.6 | | 54 | 53 | 107 |
| DMX1370FS | 13.7 | | 54 | 53 | 107 |
| DMX1380FS | 13.8 | | 54 | 53 | 107 |
| DMX1390FS | 13.9 | | 54 | 53 | 107 |
| DMX1400FS | 14 | ● | 54 | 53 | 107 |

| øDc | Tool diameter tolerance h8(mm) |
|---|---|
| øDc ≤ 3 | 0 ~ -0.014 |
| 3 < øDc ≤ 6 | 0 ~ -0.018 |
| 6 < øDc ≤ 10 | 0 ~ -0.022 |
| 10 < øDc ≤ 18 | 0 ~ -0.027 |
| 18 < øDc ≤ 20 | 0 ~ -0.033 |

## L/D = 3 (M type)

| Designation | øDc | MD20 | ℓ | ℓs | L |
|---|---|---|---|---|---|
| DMX0300FM | 3 | ● | 21 | 39 | 60 |
| DMX0310FM | 3.1 | | 24 | 36 | 60 |
| DMX0320FM | 3.2 | | 24 | 36 | 60 |
| DMX0330FM | 3.3 | | 24 | 36 | 60 |
| DMX0340FM | 3.4 | ● | 24 | 36 | 60 |
| DMX0350FM | 3.5 | ● | 24 | 36 | 60 |
| DMX0360FM | 3.6 | | 27 | 33 | 60 |
| DMX0370FM | 3.7 | | 27 | 33 | 60 |
| DMX0380FM | 3.8 | | 27 | 33 | 60 |
| DMX0390FM | 3.9 | | 27 | 33 | 60 |
| DMX0400FM | 4 | ● | 27 | 33 | 60 |
| DMX0410FM | 4.1 | | 29 | 34 | 63 |
| DMX0420FM | 4.2 | | 29 | 34 | 63 |
| DMX0430FM | 4.3 | ● | 29 | 34 | 63 |
| DMX0440FM | 4.4 | | 29 | 34 | 63 |
| DMX0450FM | 4.5 | ● | 29 | 34 | 63 |
| DMX0460FM | 4.6 | | 32 | 36 | 68 |
| DMX0470FM | 4.7 | | 32 | 36 | 68 |
| DMX0480FM | 4.8 | | 32 | 36 | 68 |
| DMX0490FM | 4.9 | | 32 | 36 | 68 |
| DMX0500FM | 5 | ● | 32 | 36 | 68 |
| DMX0510FM | 5.1 | ● | 34 | 38 | 72 |
| DMX0520FM | 5.2 | | 34 | 38 | 72 |
| DMX0530FM | 5.3 | | 34 | 38 | 72 |
| DMX0540FM | 5.4 | | 34 | 38 | 72 |
| DMX0550FM | 5.5 | ● | 34 | 38 | 72 |
| DMX0560FM | 5.6 | | 36 | 38 | 74 |
| DMX0570FM | 5.7 | | 36 | 38 | 74 |
| DMX0580FM | 5.8 | | 36 | 38 | 74 |
| DMX0590FM | 5.9 | | 36 | 38 | 74 |
| DMX0600FM | 6 | ● | 41 | 40 | 81 |
| DMX0610FM | 6.1 | | 41 | 40 | 81 |
| DMX0620FM | 6.2 | | 41 | 40 | 81 |
| DMX0630FM | 6.3 | | 41 | 40 | 81 |
| DMX0640FM | 6.4 | | 41 | 40 | 81 |
| DMX0650FM | 6.5 | ● | 41 | 40 | 81 |
| DMX0660FM | 6.6 | | 43 | 40 | 83 |
| DMX0670FM | 6.7 | | 43 | 40 | 83 |
| DMX0680FM | 6.8 | ● | 43 | 40 | 83 |
| DMX0690FM | 6.9 | | 43 | 40 | 83 |
| DMX0700FM | 7 | ● | 43 | 40 | 83 |
| DMX0710FM | 7.1 | | 45 | 42 | 87 |
| DMX0720FM | 7.2 | | 45 | 42 | 87 |
| DMX0730FM | 7.3 | | 45 | 42 | 87 |
| DMX0740FM | 7.4 | | 45 | 42 | 87 |
| DMX0750FM | 7.5 | ● | 45 | 42 | 87 |
| DMX0760FM | 7.6 | | 48 | 42 | 90 |
| DMX0770FM | 7.7 | | 48 | 42 | 90 |
| DMX0780FM | 7.8 | | 48 | 42 | 90 |
| DMX0790FM | 7.9 | | 48 | 42 | 90 |
| DMX0800FM | 8 | ● | 48 | 42 | 90 |
| DMX0810FM | 8.1 | | 53 | 43 | 96 |
| DMX0820FM | 8.2 | | 53 | 43 | 96 |
| DMX0830FM | 8.3 | | 53 | 43 | 96 |
| DMX0840FM | 8.4 | | 53 | 43 | 96 |
| DMX0850FM | 8.5 | ● | 53 | 43 | 96 |
| DMX0860FM | 8.6 | ● | 55 | 43 | 98 |
| DMX0870FM | 8.7 | | 55 | 43 | 98 |
| DMX0880FM | 8.8 | | 55 | 43 | 98 |
| DMX0890FM | 8.9 | | 55 | 43 | 98 |
| DMX0900FM | 9 | ● | 55 | 43 | 98 |



● : Line-up

## L/D = 5 (L type)

| Designation | øDc | MD20 | ℓ | ℓs | L |
|---|---|---|---|---|---|
| DMX0910FM | 9.1 | | 58 | 44 | 102 |
| DMX0920FM | 9.2 | | 58 | 44 | 102 |
| DMX0930FM | 9.3 | | 58 | 44 | 102 |
| DMX0940FM | 9.4 | | 58 | 44 | 102 |
| DMX0950FM | 9.5 | ● | 58 | 44 | 102 |
| DMX0960FM | 9.6 | | 60 | 45 | 105 |
| DMX0970FM | 9.7 | | 60 | 45 | 105 |
| DMX0980FM | 9.8 | | 60 | 45 | 105 |
| DMX0990FM | 9.9 | | 60 | 45 | 105 |
| DMX1000FM | 10 | ● | 60 | 45 | 105 |
| DMX1010FM | 10.1 | | 66 | 46 | 112 |
| DMX1020FM | 10.2 | | 66 | 46 | 112 |
| DMX1030FM | 10.3 | ● | 66 | 46 | 112 |
| DMX1040FM | 10.4 | | 66 | 46 | 112 |
| DMX1050FM | 10.5 | ● | 66 | 46 | 112 |
| DMX1060FM | 10.6 | | 68 | 46 | 114 |
| DMX1070FM | 10.7 | | 68 | 46 | 114 |
| DMX1080FM | 10.8 | | 68 | 46 | 114 |
| DMX1090FM | 10.9 | | 68 | 46 | 114 |
| DMX1100FM | 11 | ● | 68 | 46 | 114 |
| DMX1110FM | 11.1 | | 71 | 47 | 118 |
| DMX1120FM | 11.2 | | 71 | 47 | 118 |
| DMX1130FM | 11.3 | | 71 | 47 | 118 |
| DMX1140FM | 11.4 | | 71 | 47 | 118 |
| DMX1150FM | 11.5 | ● | 71 | 47 | 118 |
| DMX1160FM | 11.6 | | 73 | 48 | 121 |
| DMX1170FM | 11.7 | | 73 | 48 | 121 |
| DMX1180FM | 11.8 | | 73 | 48 | 121 |
| DMX1190FM | 11.9 | | 73 | 48 | 121 |
| DMX1200FM | 12 | ● | 73 | 48 | 121 |
| DMX1210FM | 12.1 | | 76 | 59 | 135 |
| DMX1220FM | 12.2 | | 76 | 59 | 135 |
| DMX1230FM | 12.3 | | 76 | 59 | 135 |
| DMX1240FM | 12.4 | | 76 | 59 | 135 |
| DMX1250FM | 12.5 | ● | 76 | 59 | 135 |
| DMX1260FM | 12.6 | | 78 | 59 | 137 |
| DMX1270FM | 12.7 | | 78 | 59 | 137 |
| DMX1280FM | 12.8 | | 78 | 59 | 137 |
| DMX1290FM | 12.9 | | 78 | 59 | 137 |
| DMX1300FM | 13 | ● | 78 | 59 | 137 |
| DMX1310FM | 13.1 | | 84 | 60 | 144 |
| DMX1320FM | 13.2 | | 84 | 60 | 144 |
| DMX1330FM | 13.3 | | 84 | 60 | 144 |
| DMX1340FM | 13.4 | | 84 | 60 | 144 |
| DMX1350FM | 13.5 | ● | 84 | 60 | 144 |
| DMX1360FM | 13.6 | | 86 | 61 | 147 |
| DMX1370FM | 13.7 | | 86 | 61 | 147 |
| DMX1380FM | 13.8 | | 86 | 61 | 147 |
| DMX1390FM | 13.9 | | 86 | 61 | 147 |
| DMX1400FM | 14 | ● | 86 | 61 | 147 |

| øDc | Tool diameter tolerance h8(mm) |
|---|---|
| øDc ≤ 3 | 0 ~ -0.014 |
| 3 < øDc ≤ 6 | 0 ~ -0.018 |
| 6 < øDc ≤ 10 | 0 ~ -0.022 |
| 10 < øDc ≤ 18 | 0 ~ -0.027 |
| 18 < øDc ≤ 20 | 0 ~ -0.033 |

| Designation | øDc | MD20 | ℓ | ℓs | L |
|---|---|---|---|---|---|
| DMX0300FL | 3 | ● | 27 | 39 | 66 |
| DMX0310FL | 3.1 | | 31 | 36 | 67 |
| DMX0320FL | 3.2 | | 31 | 36 | 67 |
| DMX0330FL | 3.3 | ● | 31 | 36 | 67 |
| DMX0340FL | 3.4 | ● | 31 | 36 | 67 |
| DMX0350FL | 3.5 | ● | 31 | 36 | 67 |
| DMX0360FL | 3.6 | | 35 | 33 | 68 |
| DMX0370FL | 3.7 | | 35 | 33 | 68 |
| DMX0380FL | 3.8 | | 35 | 33 | 68 |
| DMX0390FL | 3.9 | | 35 | 33 | 68 |
| DMX0400FL | 4 | ● | 35 | 33 | 68 |
| DMX0410FL | 4.1 | | 38 | 34 | 72 |
| DMX0420FL | 4.2 | ● | 38 | 34 | 72 |
| DMX0430FL | 4.3 | ● | 38 | 34 | 72 |
| DMX0440FL | 4.4 | | 38 | 34 | 72 |
| DMX0450FL | 4.5 | ● | 38 | 34 | 72 |
| DMX0460FL | 4.6 | | 42 | 36 | 78 |
| DMX0470FL | 4.7 | | 42 | 36 | 78 |
| DMX0480FL | 4.8 | | 42 | 36 | 78 |
| DMX0490FL | 4.9 | | 42 | 36 | 78 |
| DMX0500FL | 5 | ● | 42 | 36 | 78 |
| DMX0510FL | 5.1 | ● | 45 | 38 | 83 |
| DMX0520FL | 5.2 | | 45 | 38 | 83 |
| DMX0530FL | 5.3 | | 45 | 38 | 83 |
| DMX0540FL | 5.4 | | 45 | 38 | 83 |
| DMX0550FL | 5.5 | ● | 45 | 38 | 83 |
| DMX0560FL | 5.6 | | 48 | 38 | 86 |
| DMX0570FL | 5.7 | | 48 | 38 | 86 |
| DMX0580FL | 5.8 | | 48 | 38 | 86 |
| DMX0590FL | 5.9 | | 48 | 38 | 86 |
| DMX0600FL | 6 | ● | 54 | 40 | 94 |
| DMX0610FL | 6.1 | | 54 | 40 | 94 |
| DMX0620FL | 6.2 | | 54 | 40 | 94 |
| DMX0630FL | 6.3 | ● | 54 | 40 | 94 |
| DMX0640FL | 6.4 | | 54 | 40 | 94 |
| DMX0650FL | 6.5 | ● | 54 | 40 | 94 |
| DMX0660FL | 6.6 | | 57 | 40 | 97 |
| DMX0670FL | 6.7 | | 57 | 40 | 97 |
| DMX0680FL | 6.8 | ● | 57 | 40 | 97 |
| DMX0690FL | 6.9 | | 57 | 40 | 97 |
| DMX0700FL | 7 | ● | 57 | 40 | 97 |
| DMX0710FL | 7.1 | | 60 | 42 | 102 |
| DMX0720FL | 7.2 | | 60 | 42 | 102 |
| DMX0730FL | 7.3 | | 60 | 42 | 102 |
| DMX0740FL | 7.4 | | 60 | 42 | 102 |
| DMX0750FL | 7.5 | ● | 60 | 42 | 102 |
| DMX0760FL | 7.6 | | 64 | 42 | 106 |
| DMX0770FL | 7.7 | | 64 | 42 | 106 |
| DMX0780FL | 7.8 | | 64 | 42 | 106 |
| DMX0790FL | 7.9 | | 64 | 42 | 106 |
| DMX0800FL | 8 | ● | 64 | 42 | 106 |
| DMX0810FL | 8.1 | | 70 | 43 | 113 |
| DMX0820FL | 8.2 | | 70 | 43 | 113 |
| DMX0830FL | 8.3 | | 70 | 43 | 113 |
| DMX0840FL | 8.4 | | 70 | 43 | 113 |
| DMX0850FL | 8.5 | ● | 70 | 43 | 113 |
| DMX0860FL | 8.6 | ● | 73 | 43 | 116 |
| DMX0870FL | 8.7 | | 73 | 43 | 116 |
| DMX0880FL | 8.8 | | 73 | 43 | 116 |
| DMX0890FL | 8.9 | | 73 | 43 | 116 |
| DMX0900FL | 9 | ● | 73 | 43 | 116 |

● : Line-up

## L/D = 5 (L type)

| Designation | øDc | MD20 | ℓ | ℓs | L |
|---|---|---|---|---|---|
| DMX0910FL | 9.1 | | 77 | 44 | 121 |
| DMX0920FL | 9.2 | | 77 | 44 | 121 |
| DMX0930FL | 9.3 | | 77 | 44 | 121 |
| DMX0940FL | 9.4 | | 77 | 44 | 121 |
| DMX0950FL | 9.5 | ● | 77 | 44 | 121 |
| DMX0960FL | 9.6 | | 80 | 45 | 125 |
| DMX0970FL | 9.7 | ● | 80 | 45 | 125 |
| DMX0980FL | 9.8 | | 80 | 45 | 125 |
| DMX0990FL | 9.9 | | 80 | 45 | 125 |
| DMX1000FL | 10 | ● | 80 | 45 | 125 |
| DMX1010FL | 10.1 | | 87 | 46 | 133 |
| DMX1020FL | 10.2 | | 87 | 46 | 133 |
| DMX1030FL | 10.3 | ● | 87 | 46 | 133 |
| DMX1040FL | 10.4 | | 87 | 46 | 133 |
| DMX1050FL | 10.5 | ● | 87 | 46 | 133 |
| DMX1060FL | 10.6 | | 90 | 46 | 136 |
| DMX1070FL | 10.7 | | 90 | 46 | 136 |
| DMX1080FL | 10.8 | | 90 | 46 | 136 |
| DMX1090FL | 10.9 | | 90 | 46 | 136 |
| DMX1100FL | 11 | ● | 90 | 46 | 136 |
| DMX1110FL | 11.1 | | 94 | 47 | 141 |
| DMX1120FL | 11.2 | | 94 | 47 | 141 |
| DMX1130FL | 11.3 | | 94 | 47 | 141 |
| DMX1140FL | 11.4 | | 94 | 47 | 141 |
| DMX1150FL | 11.5 | ● | 94 | 47 | 141 |
| DMX1160FL | 11.6 | | 97 | 48 | 145 |
| DMX1170FL | 11.7 | | 97 | 48 | 145 |
| DMX1180FL | 11.8 | | 97 | 48 | 145 |
| DMX1190FL | 11.9 | | 97 | 48 | 145 |
| DMX1200FL | 12 | ● | 97 | 48 | 145 |
| DMX1210FL | 12.1 | | 101 | 59 | 160 |
| DMX1220FL | 12.2 | | 101 | 59 | 160 |
| DMX1230FL | 12.3 | | 101 | 59 | 160 |
| DMX1240FL | 12.4 | | 101 | 59 | 160 |
| DMX1250FL | 12.5 | ● | 101 | 59 | 160 |
| DMX1260FL | 12.6 | | 104 | 59 | 163 |
| DMX1270FL | 12.7 | | 104 | 59 | 163 |
| DMX1280FL | 12.8 | | 104 | 59 | 163 |
| DMX1290FL | 12.9 | | 104 | 59 | 163 |
| DMX1300FL | 13 | ● | 104 | 59 | 163 |
| DMX1310FL | 13.1 | | 111 | 60 | 171 |
| DMX1320FL | 13.2 | | 111 | 60 | 171 |
| DMX1330FL | 13.3 | | 111 | 60 | 171 |
| DMX1340FL | 13.4 | | 111 | 60 | 171 |
| DMX1350FL | 13.5 | ● | 111 | 60 | 171 |
| DMX1360FL | 13.6 | | 114 | 61 | 175 |
| DMX1370FL | 13.7 | | 114 | 61 | 175 |
| DMX1380FL | 13.8 | | 114 | 61 | 175 |
| DMX1390FL | 13.9 | | 114 | 61 | 175 |
| DMX1400FL | 14 | ● | 114 | 61 | 175 |
| DMX1410FL | 14.1 | | 118 | 62 | 180 |
| DMX1420FL | 14.2 | ● | 118 | 62 | 180 |
| DMX1430FL | 14.3 | | 118 | 62 | 180 |
| DMX1440FL | 14.4 | | 118 | 62 | 180 |
| DMX1450FL | 14.5 | | 118 | 62 | 180 |
| DMX1460FL | 14.6 | | 121 | 62 | 183 |
| DMX1470FL | 14.7 | | 121 | 62 | 183 |
| DMX1480FL | 14.8 | | 121 | 62 | 183 |
| DMX1490FL | 14.9 | | 121 | 62 | 183 |
| DMX1500FL | 15 | | 121 | 62 | 183 |

| Designation | øDc | MD20 | ℓ | ℓs | L |
|---|---|---|---|---|---|
| DMX1510FL | 15.1 | | 125 | 63 | 188 |
| DMX1520FL | 15.2 | | 125 | 63 | 188 |
| DMX1530FL | 15.3 | | 125 | 63 | 188 |
| DMX1540FL | 15.4 | | 125 | 63 | 188 |
| DMX1550FL | 15.5 | | 125 | 63 | 188 |
| DMX1560FL | 15.6 | | 128 | 64 | 192 |
| DMX1570FL | 15.7 | | 128 | 64 | 192 |
| DMX1580FL | 15.8 | | 128 | 64 | 192 |
| DMX1590FL | 15.9 | | 128 | 64 | 192 |
| DMX1600FL | 16 | | 128 | 64 | 192 |
| DMX1650FL | 16.5 | | 136 | 65 | 201 |
| DMX1700FL | 17 | | 136 | 65 | 201 |
| DMX1750FL | 17.5 | | 136 | 65 | 201 |
| DMX1800FL | 18 | | 136 | 65 | 201 |
| DMX1850FL | 18.5 | | 152 | 65 | 217 |
| DMX1900FL | 19 | | 152 | 65 | 217 |
| DMX1950FL | 19.5 | | 152 | 65 | 217 |
| DMX2000FL | 20 | | 152 | 65 | 217 |

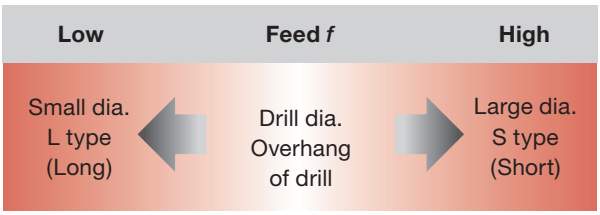
| øDc | Tool diameter tolerance h8(mm) |
|---|---|
| øDc ≤ 3 | 0 ~ -0.014 |
| 3 < øDc ≤ 6 | 0 ~ -0.018 |
| 6 < øDc ≤ 10 | 0 ~ -0.022 |
| 10 < øDc ≤ 18 | 0 ~ -0.027 |
| 18 < øDc ≤ 20 | 0 ~ -0.033 |

● : Line-up

## STANDARD DRILLING CONDITIONS

| ISO | Workpiece material | Cutting speed: *Vc* (m/min) | Feed: *f* (mm/rev) ø3 ~ ø5 | ø5 ~ ø10 | ø10 ~ ø16 | ø16 ~ ø20 |
|---|---|---|---|---|---|---|
| N | Aluminium alloys | 60 - 120 | 0.2 - 0.4 | 0.3 - 0.5 | 0.4 - 0.6 | 0.5 - 0.7 |
| K | Grey cast irons | 40 - 80 | 0.15 - 0.35 | 0.25 - 0.45 | 0.3 - 0.6 | 0.35 - 0.65 |
| | Ductile cast irons | 30 - 70 | 0.15 - 0.3 | 0.2 - 0.4 | 0.25 - 0.5 | 0.3 - 0.6 |

Notes:
- The above table shows standard and typical cutting conditions for DMX - FM type drills.
- Because the cutting conditions may be changed depending on the material type, hardness, machinability, machine tool, and coolant, the most appropriate conditions must be decided whilst referring the chip control condition and tool failure mode.
- When using the smaller side of the diameter range, the feed rate should be set lower.
- When working with long overhang or using "L" type drills, the feed rate should be set lower.




## NOTE ON CUTTING FLUID

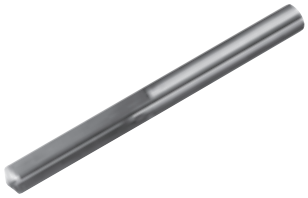
- Cutting fluid should be sufficiently supplied to the drill point and the entrance of the hole.
- Use a water soluble cutting fluid containing relatively high content of extreme pressure additive for heavy duty cutting or use a water insoluble cutting fluid.

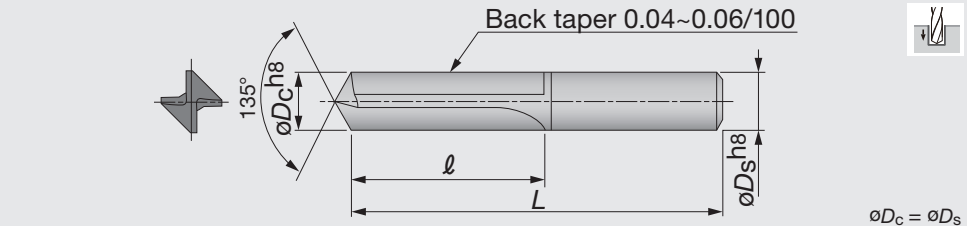
- No. of revolutions ($min^{-1}$) = Cutting speed × 1000 ÷ 3.14 ÷ Tool diameter
- Table feed (mm/min) = No. of revolutions × Feed per revolution

## FDS

Straight flute soliddrill for pre-tap hole drilling of aluminum, without oil hole

### L/D = 2 (S type)






### For tupped holes

| Designation | øDc | Tolerance | G1F | ℓ | L | Application |
|---|---|---|---|---|---|---|
| FDS0257 | 2.57 | 0 - 0.014 | ● | 18 | 60 | M3 |
| FDS0337 | 3.37 | 0 - 0.018 | ● | 18 | 60 | M4 |
| FDS0429 | 4.29 | 0 - 0.018 | ● | 23 | 70 | M5 |
| FDS0511 | 5.11 | 0 - 0.018 | ● | 28 | 80 | M6 |
| FDS0683 | 6.83 | 0 - 0.022 | ● | 36 | 90 | M8 |
| FDS0860 | 8.6 | 0 - 0.022 | ● | 46 | 110 | M10 |

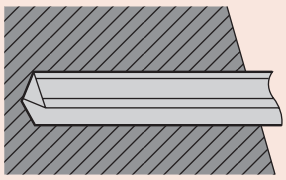
### For bolt holes

| Designation | øDc | Tolerance | G1F | ℓ | L | Application |
|---|---|---|---|---|---|---|
| FDS0340 | 3.4 | 0 - 0.018 | ● | 18 | 60 | M3 |
| FDS0450 | 4.5 | 0 - 0.018 | ● | 23 | 70 | M4 |
| FDS0550 | 5.5 | 0 - 0.018 | | 28 | 80 | M5 |
| FDS0660 | 6.6 | 0 - 0.022 | ● | 36 | 90 | M6 |
| FDS0900 | 9 | 0 - 0.022 | | 46 | 110 | M8 |
| FDS1100 | 11 | 0 - 0.027 | ● | 55 | 120 | M10 |

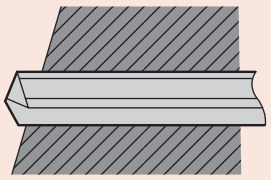
● : Line-up

Notes: • Other sized drills and step type drills can be made to order.
• When ordering, specify the diameter, overall length, shank specifications of the drill, the work material to be drilled, and the drilling depth.

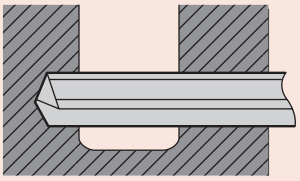
## APPLICATION EXAMPLES OF FD DRILLS (EFFECTIVE FOR FOLLOWING OPERATIONS)



Drilling into angled face



Drilling through angled face



Interrupted drilling

## STANDARD CUTTING CONDIOTIONS

| ISO | Workpiece material | Cutting speed: Vc (m/min) | Feed: f (mm/rev) |
|---|---|---|---|
| N | Aluminium alloys (Brittle) | 50 - 80 | 0.1 - 0.3 |
| | Aluminium alloys (Sticky) | 40 - 60 | 0.1 - 0.2 |
| K | Grey cast irons | 40 - 60 | 0.1 - 0.3 |
| | Ductile cast irons | 30 - 50 | 0.08 - 0.2 |

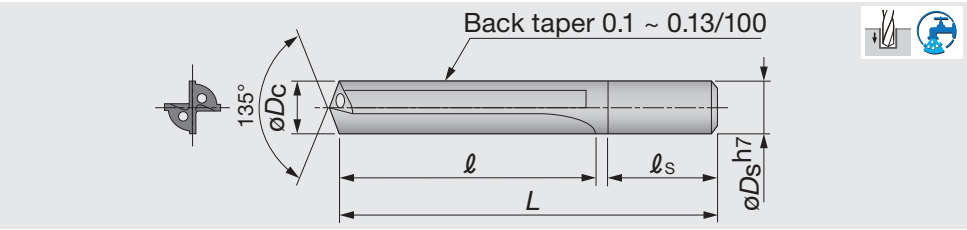
Note : Use a water soluble emulsion type cutting fluid.
Excessive run out as mounted on the machine may affect drilled hole accuracies and tool life.
(Holding with a scroll chuck is not recommended.)

- No. of revolutions ($min^{-1}$) = Cutting speed × 1000 ÷ 3.14 ÷ Tool diameter
- Table feed (mm/min) = No. of revolutions × Feed per revolution

## FDC

Straight flute soliddrill for high feed drilling of aluminum and cast iron, with oil hole






### L/D = 5 (S type)

| Designation | øDc | G1F | øDs | ℓ | ℓs | L |
|---|---|---|---|---|---|---|
| FDC0500S | 5 | | 5 | 40 | 38 | 80 |
| FDC0510S | 5.1 | ● | 6 | 44 | 40 | 85 |
| FDC0520S | 5.2 | | 6 | 44 | 40 | 85 |
| FDC0530S | 5.3 | | 6 | 44 | 40 | 85 |
| FDC0540S | 5.4 | | 6 | 44 | 40 | 85 |
| FDC0550S | 5.5 | | 6 | 44 | 40 | 85 |
| FDC0560S | 5.6 | | 6 | 48 | 40 | 90 |
| FDC0570S | 5.7 | | 6 | 48 | 40 | 90 |
| FDC0580S | 5.8 | | 6 | 48 | 40 | 90 |
| FDC0590S | 5.9 | | 6 | 48 | 40 | 90 |
| FDC0600S | 6 | ● | 6 | 48 | 40 | 90 |
| FDC0610S | 6.1 | | 7 | 52 | 40 | 95 |
| FDC0620S | 6.2 | | 7 | 52 | 40 | 95 |
| FDC0630S | 6.3 | | 7 | 52 | 40 | 95 |
| FDC0640S | 6.4 | | 7 | 52 | 40 | 95 |
| FDC0650S | 6.5 | | 7 | 52 | 40 | 95 |
| FDC0660S | 6.6 | | 7 | 56 | 40 | 100 |
| FDC0670S | 6.7 | | 7 | 56 | 40 | 100 |
| FDC0680S | 6.8 | | 7 | 56 | 40 | 100 |
| FDC0690S | 6.9 | | 7 | 56 | 40 | 100 |
| FDC0700S | 7 | | 7 | 56 | 40 | 100 |
| FDC0710S | 7.1 | | 8 | 60 | 42 | 105 |
| FDC0720S | 7.2 | | 8 | 60 | 42 | 105 |
| FDC0730S | 7.3 | | 8 | 60 | 42 | 105 |
| FDC0740S | 7.4 | | 8 | 60 | 42 | 105 |
| FDC0750S | 7.5 | | 8 | 60 | 42 | 105 |
| FDC0760S | 7.6 | | 8 | 64 | 42 | 110 |
| FDC0770S | 7.7 | | 8 | 64 | 42 | 110 |
| FDC0780S | 7.8 | | 8 | 64 | 42 | 110 |
| FDC0790S | 7.9 | | 8 | 64 | 42 | 110 |
| FDC0800S | 8 | | 8 | 64 | 42 | 110 |
| FDC0810S | 8.1 | | 9 | 68 | 44 | 115 |
| FDC0820S | 8.2 | | 9 | 68 | 44 | 115 |
| FDC0830S | 8.3 | | 9 | 68 | 44 | 115 |
| FDC0840S | 8.4 | ● | 9 | 68 | 44 | 115 |
| FDC0850S | 8.5 | | 9 | 68 | 44 | 115 |
| FDC0860S | 8.6 | ● | 9 | 72 | 44 | 120 |
| FDC0870S | 8.7 | | 9 | 72 | 44 | 120 |
| FDC0880S | 8.8 | | 9 | 72 | 44 | 120 |
| FDC0890S | 8.9 | | 9 | 72 | 44 | 120 |
| FDC0900S | 9 | | 9 | 72 | 44 | 120 |
| FDC0910S | 9.1 | | 10 | 76 | 44 | 125 |
| FDC0920S | 9.2 | | 10 | 76 | 44 | 125 |
| FDC0930S | 9.3 | | 10 | 76 | 44 | 125 |
| FDC0940S | 9.4 | | 10 | 76 | 44 | 125 |
| FDC0950S | 9.5 | | 10 | 76 | 44 | 125 |
| FDC0960S | 9.6 | | 10 | 80 | 46 | 130 |
| FDC0970S | 9.7 | | 10 | 80 | 46 | 130 |
| FDC0980S | 9.8 | | 10 | 80 | 46 | 130 |
| FDC0990S | 9.9 | | 10 | 80 | 46 | 130 |
| FDC1000S | 10 | | 10 | 80 | 46 | 130 |

| Designation | øDc | G1F | øDs | ℓ | ℓs | L |
|---|---|---|---|---|---|---|
| FDC1050S | 10.5 | ● | 11 | 84 | 46 | 140 |
| FDC1100S | 11 | ● | 11 | 88 | 46 | 140 |
| FDC1150S | 11.5 | ● | 12 | 92 | 48 | 150 |
| FDC1200S | 12 | ● | 12 | 96 | 48 | 150 |
| FDC1250S | 12.5 | ● | 13 | 100 | 50 | 160 |
| FDC1300S | 13 | ● | 13 | 104 | 50 | 160 |
| FDC1350S | 13.5 | ● | 14 | 108 | 52 | 170 |
| FDC1400S | 14 | ● | 14 | 112 | 52 | 170 |
| FDC1450S | 14.5 | ● | 15 | 116 | 54 | 180 |
| FDC1500S | 15 | ● | 15 | 120 | 54 | 180 |
| FDC1550S | 15.5 | ● | 16 | 124 | 56 | 190 |
| FDC1600S | 16 | ● | 16 | 128 | 56 | 190 |

| øDc | Tool diameter tolerance(mm) |
|---|---|
| 5 ≤ øDc ≤ 6 | +0.02 ~ +0.01 |
| 6 < øDc ≤ 16 | +0.025 ~ +0.015 |

● : Line-up

## L/D = 8 (L type)

| Designation | øDc | G1F | øDs | ℓ | ℓs | L |
|---|---|---|---|---|---|---|
| FDC0500L | 5 | ● | 5 | 55 | 38 | 95 |
| FDC0510L | 5.1 | | 6 | 61 | 40 | 105 |
| FDC0520L | 5.2 | | 6 | 61 | 40 | 105 |
| FDC0530L | 5.3 | | 6 | 61 | 40 | 105 |
| FDC0540L | 5.4 | | 6 | 61 | 40 | 105 |
| FDC0550L | 5.5 | ● | 6 | 61 | 40 | 105 |
| FDC0560L | 5.6 | | 6 | 66 | 40 | 110 |
| FDC0570L | 5.7 | | 6 | 66 | 40 | 110 |
| FDC0580L | 5.8 | | 6 | 66 | 40 | 110 |
| FDC0590L | 5.9 | | 6 | 66 | 40 | 110 |
| FDC0600L | 6 | ● | 6 | 66 | 40 | 110 |
| FDC0610L | 6.1 | | 7 | 72 | 40 | 115 |
| FDC0620L | 6.2 | ● | 7 | 72 | 40 | 115 |
| FDC0630L | 6.3 | | 7 | 72 | 40 | 115 |
| FDC0640L | 6.4 | | 7 | 72 | 40 | 115 |
| FDC0650L | 6.5 | ● | 7 | 72 | 40 | 115 |
| FDC0660L | 6.6 | | 7 | 77 | 40 | 120 |
| FDC0670L | 6.7 | | 7 | 77 | 40 | 120 |
| FDC0680L | 6.8 | ● | 7 | 77 | 40 | 120 |
| FDC0690L | 6.9 | | 7 | 77 | 40 | 120 |
| FDC0700L | 7 | ● | 7 | 77 | 40 | 120 |
| FDC0710L | 7.1 | | 8 | 83 | 42 | 125 |
| FDC0720L | 7.2 | | 8 | 83 | 42 | 125 |
| FDC0730L | 7.3 | | 8 | 83 | 42 | 125 |
| FDC0740L | 7.4 | | 8 | 83 | 42 | 125 |
| FDC0750L | 7.5 | ● | 8 | 83 | 42 | 125 |

| Designation | øDc | G1F | øDs | ℓ | ℓs | L |
|---|---|---|---|---|---|---|
| FDC0760L | 7.6 | | 8 | 88 | 42 | 130 |
| FDC0770L | 7.7 | | 8 | 88 | 42 | 130 |
| FDC0780L | 7.8 | ● | 8 | 88 | 42 | 130 |
| FDC0790L | 7.9 | | 8 | 88 | 42 | 130 |
| FDC0800L | 8 | ● | 8 | 88 | 42 | 130 |
| FDC0810L | 8.1 | | 9 | 94 | 44 | 140 |
| FDC0820L | 8.2 | | 9 | 94 | 44 | 140 |
| FDC0830L | 8.3 | | 9 | 94 | 44 | 140 |
| FDC0840L | 8.4 | | 9 | 94 | 44 | 140 |
| FDC0850L | 8.5 | ● | 9 | 94 | 44 | 140 |
| FDC0860L | 8.6 | ● | 9 | 99 | 44 | 145 |
| FDC0870L | 8.7 | | 9 | 99 | 44 | 145 |
| FDC0880L | 8.8 | | 9 | 99 | 44 | 145 |
| FDC0890L | 8.9 | | 9 | 99 | 44 | 145 |
| FDC0900L | 9 | ● | 9 | 99 | 44 | 145 |
| FDC0910L | 9.1 | | 10 | 105 | 44 | 150 |
| FDC0920L | 9.2 | | 10 | 105 | 44 | 150 |
| FDC0930L | 9.3 | | 10 | 105 | 44 | 150 |
| FDC0940L | 9.4 | | 10 | 105 | 44 | 150 |
| FDC0950L | 9.5 | ● | 10 | 105 | 44 | 150 |
| FDC0960L | 9.6 | | 10 | 110 | 46 | 160 |
| FDC0970L | 9.7 | | 10 | 110 | 46 | 160 |
| FDC0980L | 9.8 | | 10 | 110 | 46 | 160 |
| FDC0990L | 9.9 | | 10 | 110 | 46 | 160 |
| FDC1000L | 10 | ● | 10 | 110 | 46 | 160 |

● : Line-up

| øDc | Tool diameter tolerance (mm) |
|---|---|
| 5 ≤ øDc ≤ 6 | +0.02 ~ +0.01 |
| 6 < øDc ≤ 10 | +0.025 ~ +0.015 |

### Cutting fluid

- Supply the cutting fluid through the drill.
- The required fluid pressure is 0.5 to 1.0 MPa
- Use a water soluble cutting fluid containing a large amount of extreme pressure additive.

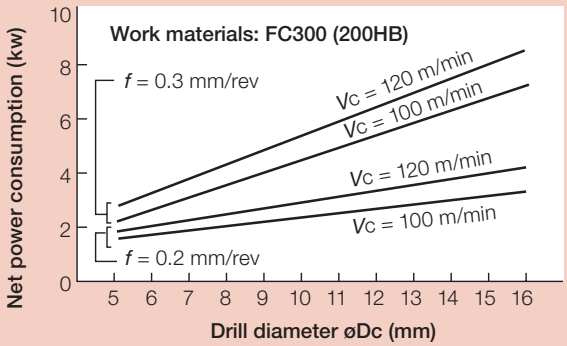
## STANDARD CUTTING CONDITIONS

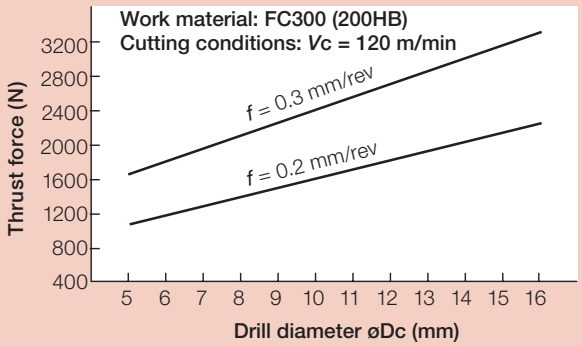
| ISO | Workpiece material | Cutting speed: Vc (m/min) ø5 ~ ø8 | ø8 ~ ø12 | ø12 ~ ø16 | Feed: f (mm/rev) ø5 ~ ø8 | ø8 ~ ø12 | ø12 ~ ø16 |
|---|---|---|---|---|---|---|---|
| N | Aluminium alloys | 100 - 140 | 120 - 160 | 140 - 180 | 0.1 - 0.25 | 0.15 - 0.3 | 0.15 - 0.3 |
| K | Grey Cast irons | 90 - 120 | 110 - 140 | 130 - 160 | 0.1 - 0.25 | 0.2 - 0.3 | 0.2 - 0.30 |
| | Ductile cast irons | 60 - 80 | 70 - 90 | 70 - 100 | 0.1 - 0.25 | 0.15 - 0.3 | 0.15 - 0.3 |

**Caution:**
When changing a tool, completely clean the chips which may be clogging in the collet or adapter.

Note:
The cutting conditions shown left may vary depending on the work material, coolant dilution ratio and coolant supply pressure used.

## CUTTING PERFORMANCE

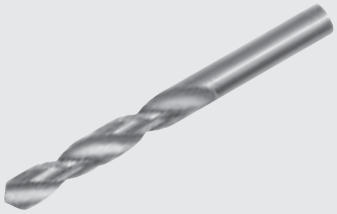


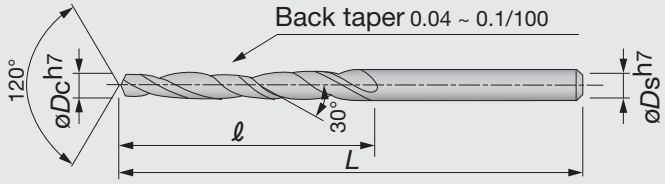




- No. of revolutions ($min^{-1}$) = Cutting speed × 1000 ÷ 3.14 ÷ Tool diameter
- Table feed (mm/min) = No. of revolutions × Feed per revolution

## CDS

Soliddrill for aluminum and cast iron with 120° point angle, without oil hole and shank size as diameter for hole depths up to L/D 12






øDc = øDs

| Designation | øDc | UM | ℓ | L |
|---|---|---|---|---|
| CDS-004 | 0.4 | ● | 6 | 30 |
| CDS-0045 | 0.45 | | 6 | 30 |
| CDS-005 | 0.5 | ● | 6 | 30 |
| CDS-0055 | 0.55 | | 6 | 30 |
| CDS-006 | 0.6 | ● | 6 | 30 |
| CDS-0065 | 0.65 | | 6 | 30 |
| CDS-007 | 0.7 | ● | 6 | 30 |
| CDS-0075 | 0.75 | | 6 | 30 |
| CDS-008 | 0.8 | ● | 8 | 30 |
| CDS-0085 | 0.85 | | 8 | 30 |
| CDS-009 | 0.9 | ● | 8 | 30 |
| CDS-0095 | 0.95 | | 10 | 38 |
| CDS-010 | 1 | ● | 10 | 38 |
| CDS-0105 | 1.05 | | 10 | 38 |
| CDS-011 | 1.1 | ● | 10 | 38 |
| CDS-0115 | 1.15 | | 10 | 38 |
| CDS-012 | 1.2 | ● | 10 | 38 |
| CDS-0125 | 1.25 | | 10 | 38 |
| CDS-013 | 1.3 | ● | 10 | 38 |
| CDS-0135 | 1.35 | | 10 | 38 |
| CDS-014 | 1.4 | ● | 10 | 38 |
| CDS-0145 | 1.45 | | 10 | 38 |
| CDS-015 | 1.5 | ● | 10 | 38 |
| CDS-0155 | 1.55 | | 22 | 45 |
| CDS-016 | 1.6 | ● | 22 | 45 |
| CDS-0165 | 1.65 | | 22 | 45 |
| CDS-017 | 1.7 | ● | 22 | 45 |
| CDS-0175 | 1.75 | | 22 | 45 |
| CDS-018 | 1.8 | ● | 22 | 45 |
| CDS-0185 | 1.85 | | 22 | 45 |
| CDS-019 | 1.9 | ● | 22 | 45 |
| CDS-0195 | 1.95 | | 22 | 45 |
| CDS-020 | 2 | ● | 22 | 45 |
| CDS-0205 | 2.05 | | 22 | 45 |
| CDS-021 | 2.1 | ● | 22 | 45 |
| CDS-0215 | 2.15 | | 22 | 45 |
| CDS-022 | 2.2 | ● | 22 | 45 |
| CDS-0225 | 2.25 | | 22 | 45 |
| CDS-023 | 2.3 | ● | 22 | 45 |
| CDS-0235 | 2.35 | | 22 | 45 |
| CDS-024 | 2.4 | ● | 22 | 45 |
| CDS-0245 | 2.45 | | 22 | 45 |
| CDS-025 | 2.5 | ● | 22 | 45 |
| CDS-0255 | 2.55 | ● | 22 | 45 |
| CDS-026 | 2.6 | ● | 22 | 45 |
| CDS-0265 | 2.65 | | 25 | 45 |
| CDS-027 | 2.7 | ● | 25 | 45 |
| CDS-0275 | 2.75 | | 25 | 45 |
| CDS-028 | 2.8 | ● | 25 | 45 |
| CDS-0285 | 2.85 | | 25 | 45 |
| CDS-029 | 2.9 | ● | 25 | 45 |
| CDS-0295 | 2.95 | | 25 | 45 |
| CDS-030 | 3 | ● | 25 | 45 |

| Designation | øDc | UM | ℓ | L |
|---|---|---|---|---|
| CDS-0305 | 3.05 | | 27 | 50 |
| CDS-031 | 3.1 | ● | 27 | 50 |
| CDS-0315 | 3.15 | | 27 | 50 |
| CDS-032 | 3.2 | ● | 27 | 50 |
| CDS-0325 | 3.25 | | 27 | 50 |
| CDS-033 | 3.3 | ● | 27 | 50 |
| CDS-0335 | 3.35 | | 27 | 50 |
| CDS-034 | 3.4 | ● | 27 | 50 |
| CDS-0345 | 3.45 | | 27 | 50 |
| CDS-035 | 3.5 | ● | 27 | 55 |
| CDS-0355 | 3.55 | | 30 | 55 |
| CDS-036 | 3.6 | ● | 30 | 55 |
| CDS-0365 | 3.65 | | 30 | 55 |
| CDS-037 | 3.7 | ● | 30 | 55 |
| CDS-0375 | 3.75 | | 30 | 55 |
| CDS-038 | 3.8 | ● | 30 | 55 |
| CDS-0385 | 3.85 | | 30 | 55 |
| CDS-039 | 3.9 | ● | 30 | 55 |
| CDS-0395 | 3.95 | | 30 | 55 |
| CDS-040 | 4 | ● | 30 | 55 |
| CDS-0405 | 4.05 | | 34 | 60 |
| CDS-041 | 4.1 | ● | 34 | 60 |
| CDS-0415 | 4.15 | | 34 | 60 |
| CDS-042 | 4.2 | ● | 34 | 60 |
| CDS-0425 | 4.25 | | 34 | 60 |
| CDS-043 | 4.3 | ● | 34 | 60 |
| CDS-0435 | 4.35 | | 34 | 60 |
| CDS-044 | 4.4 | ● | 34 | 60 |
| CDS-0445 | 4.45 | | 34 | 60 |
| CDS-045 | 4.5 | ● | 34 | 60 |
| CDS-0455 | 4.55 | | 34 | 60 |
| CDS-046 | 4.6 | ● | 34 | 60 |
| CDS-0465 | 4.65 | | 34 | 60 |
| CDS-047 | 4.7 | ● | 34 | 60 |
| CDS-0475 | 4.75 | | 34 | 60 |
| CDS-048 | 4.8 | ● | 34 | 60 |
| CDS-0485 | 4.85 | | 34 | 60 |
| CDS-049 | 4.9 | ● | 34 | 60 |
| CDS-0495 | 4.95 | | 34 | 60 |
| CDS-050 | 5 | ● | 34 | 60 |
| CDS-0505 | 5.05 | | 38 | 65 |
| CDS-051 | 5.1 | ● | 38 | 65 |
| CDS-0515 | 5.15 | | 38 | 65 |
| CDS-052 | 5.2 | ● | 38 | 65 |
| CDS-0525 | 5.25 | | 38 | 65 |
| CDS-053 | 5.3 | ● | 38 | 65 |
| CDS-0535 | 5.35 | | 38 | 65 |
| CDS-054 | 5.4 | ● | 38 | 65 |
| CDS-0545 | 5.45 | | 38 | 65 |
| CDS-055 | 5.5 | ● | 38 | 65 |
| CDS-0555 | 5.55 | | 40 | 70 |
| CDS-056 | 5.6 | ● | 40 | 70 |
| CDS-0565 | 5.65 | | 40 | 70 |





● : Line-up

| Designation | øDc | UM | ℓ | L |
|---|---|---|---|---|
| CDS-057 | 5.7 | ● | 40 | 70 |
| CDS-0575 | 5.75 | | 40 | 70 |
| CDS-058 | 5.8 | ● | 40 | 70 |
| CDS-0585 | 5.85 | | 40 | 70 |
| CDS-059 | 5.9 | ● | 40 | 70 |
| CDS-0595 | 5.95 | | 40 | 70 |
| CDS-060 | 6 | ● | 40 | 70 |
| CDS-0605 | 6.05 | | 43 | 75 |
| CDS-0610 | 6.1 | | 43 | 75 |
| CDS-0615 | 6.15 | | 43 | 75 |
| CDS-062 | 6.2 | ● | 43 | 75 |
| CDS-0625 | 6.25 | | 43 | 75 |
| CDS-0630 | 6.3 | | 43 | 75 |
| CDS-0635 | 6.35 | | 43 | 75 |
| CDS-064 | 6.4 | ● | 43 | 75 |
| CDS-0645 | 6.45 | | 43 | 75 |
| CDS-065 | 6.5 | ● | 43 | 75 |
| CDS-0655 | 6.55 | | 46 | 80 |
| CDS-066 | 6.6 | ● | 46 | 80 |
| CDS-0665 | 6.65 | | 46 | 80 |
| CDS-0670 | 6.7 | | 46 | 80 |
| CDS-0675 | 6.75 | | 46 | 80 |
| CDS-068 | 6.8 | ● | 46 | 80 |
| CDS-0685 | 6.85 | | 46 | 80 |
| CDS-0690 | 6.9 | | 46 | 80 |
| CDS-0695 | 6.95 | | 46 | 80 |
| CDS-070 | 7 | ● | 46 | 80 |
| CDS-0705 | 7.05 | | 46 | 80 |
| CDS-0710 | 7.1 | | 46 | 80 |
| CDS-0715 | 7.15 | | 46 | 80 |
| CDS-072 | 7.2 | ● | 46 | 80 |
| CDS-0725 | 7.25 | | 46 | 80 |
| CDS-0730 | 7.3 | | 46 | 80 |
| CDS-0735 | 7.35 | | 46 | 80 |
| CDS-074 | 7.4 | ● | 46 | 80 |
| CDS-0745 | 7.45 | | 46 | 80 |
| CDS-075 | 7.5 | ● | 46 | 80 |
| CDS-0755 | 7.55 | | 50 | 85 |
| CDS-076 | 7.6 | ● | 50 | 85 |
| CDS-0765 | 7.65 | | 50 | 85 |
| CDS-0770 | 7.7 | | 50 | 85 |
| CDS-0775 | 7.75 | | 50 | 85 |
| CDS-078 | 7.8 | ● | 50 | 85 |
| CDS-0785 | 7.85 | | 50 | 85 |
| CDS-0790 | 7.9 | | 50 | 85 |
| CDS-0795 | 7.95 | | 50 | 85 |
| CDS-080 | 8 | ● | 50 | 85 |
| CDS-0805 | 8.05 | | 53 | 85 |
| CDS-0810 | 8.1 | | 53 | 85 |
| CDS-0815 | 8.15 | | 53 | 85 |
| CDS-0820 | 8.2 | | 53 | 85 |
| CDS-0825 | 8.25 | | 53 | 85 |
| CDS-0830 | 8.3 | | 53 | 85 |
| CDS-0835 | 8.35 | | 53 | 85 |
| CDS-0840 | 8.4 | | 53 | 85 |
| CDS-0845 | 8.45 | | 53 | 85 |
| CDS-085 | 8.5 | ● | 53 | 85 |
| CDS-0855 | 8.55 | | 53 | 85 |
| CDS-0860 | 8.6 | | 53 | 85 |
| CDS-0865 | 8.65 | | 53 | 85 |
| CDS-0870 | 8.7 | | 53 | 85 |
| CDS-0875 | 8.75 | | 53 | 85 |
| CDS-0880 | 8.8 | | 53 | 85 |
| CDS-0885 | 8.85 | | 53 | 85 |
| CDS-0890 | 8.9 | | 53 | 85 |
| CDS-0895 | 8.95 | | 53 | 85 |
| CDS-090 | 9 | ● | 53 | 85 |
| CDS-0905 | 9.05 | | 60 | 90 |
| CDS-0910 | 9.1 | | 60 | 90 |
| CDS-0915 | 9.15 | | 60 | 90 |
| CDS-0920 | 9.2 | | 60 | 90 |
| CDS-0925 | 9.25 | | 60 | 90 |
| CDS-0930 | 9.3 | | 60 | 90 |
| CDS-0935 | 9.35 | | 60 | 90 |
| CDS-0940 | 9.4 | | 60 | 90 |
| CDS-0945 | 9.45 | | 60 | 90 |
| CDS-095 | 9.5 | ● | 60 | 90 |
| CDS-0955 | 9.55 | | 60 | 90 |
| CDS-0960 | 9.6 | | 60 | 90 |
| CDS-0965 | 9.65 | | 60 | 90 |
| CDS-0970 | 9.7 | | 60 | 90 |
| CDS-0975 | 9.75 | | 60 | 90 |
| CDS-0980 | 9.8 | | 60 | 90 |
| CDS-0985 | 9.85 | | 60 | 90 |
| CDS-0990 | 9.9 | | 60 | 90 |
| CDS-0995 | 9.95 | | 60 | 90 |
| CDS-100 | 10 | ● | 60 | 90 |
| CDS-1010 | 10.1 | | 80 | 120 |
| CDS-1020 | 10.2 | | 80 | 120 |
| CDS-1030 | 10.3 | | 80 | 120 |
| CDS-1040 | 10.4 | | 80 | 120 |
| CDS-1050 | 10.5 | | 80 | 120 |
| CDS-1060 | 10.6 | | 80 | 120 |
| CDS-1070 | 10.7 | | 80 | 120 |
| CDS-1080 | 10.8 | | 80 | 120 |
| CDS-1090 | 10.9 | | 80 | 120 |
| CDS-1100 | 11 | | 80 | 120 |
| CDS-1110 | 11.1 | | 80 | 120 |
| CDS-1120 | 11.2 | | 80 | 120 |
| CDS-1130 | 11.3 | | 80 | 120 |
| CDS-1140 | 11.4 | | 80 | 120 |
| CDS-1150 | 11.5 | | 80 | 120 |
| CDS-1160 | 11.6 | | 80 | 120 |
| CDS-1170 | 11.7 | | 80 | 120 |
| CDS-1180 | 11.8 | | 80 | 120 |
| CDS-1190 | 11.9 | | 80 | 120 |
| CDS-1200 | 12 | | 80 | 120 |
| CDS-1210 | 12.1 | | 80 | 120 |
| CDS-1220 | 12.2 | | 80 | 120 |
| CDS-1230 | 12.3 | | 80 | 120 |
| CDS-1240 | 12.4 | | 80 | 120 |
| CDS-1250 | 12.5 | | 80 | 120 |
| CDS-1260 | 12.6 | | 80 | 120 |
| CDS-1270 | 12.7 | | 80 | 120 |
| CDS-1280 | 12.8 | | 80 | 120 |
| CDS-1290 | 12.9 | | 80 | 120 |
| CDS-1300 | 13 | | 80 | 120 |

| øDc | Tool diameter tolerance h7(mm) |
|---|---|
| øDc ≤ 3 | 0 ~ -0.01 |
| 3 < øDc ≤ 6 | 0 ~ -0.012 |
| 6 < øDc ≤ 10 | 0 ~ -0.015 |
| 10 < øDc ≤ 13 | 0 ~ -0.018 |

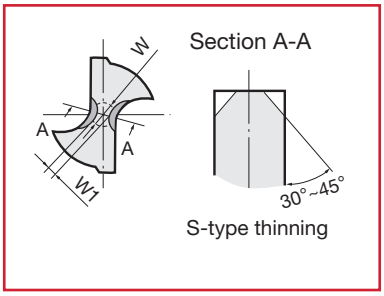
● : Line-up

## CAUTIONARY NOTES

- To prevent edge chipping, hone cutting edges as follows: Honing width: 0.02 ~ 0.05 mm Honing angle: -20˚ to -30˚. Chipping is likely to occur on edges whilst drilling hard materials, a larger honing width is recommended.
- When drilling into an inclined surface, special care should be taken to prevent drill breakage. Use of drill bushing is recommended for such case.

## REGRINDING

- Carry out regrinding when corner wear reaches the margin width.
- Avoid using silicon carbide grinding wheels or hand grinding whenever possible.Use diamond grinding wheels of 200 to 400 mesh.
- Apply web thinning for the drill above ø6 mm. S-type thinning shown in figure at right is recommended. Preferable thinning width (W1) is about 1/2 to 1/3 of web thickness (W).

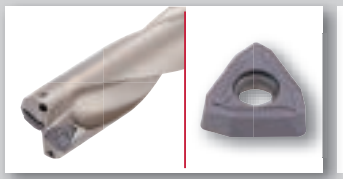



## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Cutting speed: *Vc* (m/min) ø0.4 ~ ø2 | ø2 ~ ø13 | Feed: *f* (mm/rev) ø0.4 ~ ø1 | ø1 ~ ø2 | ø2 ~ ø3 | ø3 ~ ø5 | ø5 ~ ø13 |
|---|---|---|---|---|---|---|---|---|
| K | Grey cast irons (200HB) | 20 - 40 | 30 - 50 | 0.005 - 0.03 | 0.01 - 0.06 | 0.03 - 0.12 | 0.05 - 0.15 | 0.1 - 0.4 |
| K | Ductile cast irons (300HB) | 20 - 40 | 30 - 50 | 0.005 - 0.02 | 0.01 - 0.05 | 0.03 - 0.1 | 0.03 - 0.1 | 0.07 - 0.25 |
| N | Aluminium alloys | 20 - 50 | 30 - 50 | 0.01 - 0.05 | 0.04 - 0.15 | 0.06 - 0.2 | 0.1 - 0.25 | 0.15 - 0.5 |
| N | Copper alloys | 20 - 50 | 30 - 50 | 0.01 - 0.05 | 0.04 - 0.15 | 0.06 - 0.2 | 0.1 - 0.25 | 0.15 - 0.5 |
| N | Reinforced plastics | 20 - 40 | 30 - 50 | 0.01 - 0.05 | 0.04 - 0.15 | 0.06 - 0.2 | 0.1 - 0.25 | 0.15 - 0.5 |

- No. of revolutions ($min^{-1}$) = Cutting speed × 1000 ÷ 3.14 ÷ Tool diameter
- Table feed (mm/min) = No. of revolutions × Feed per revolution

MEMO

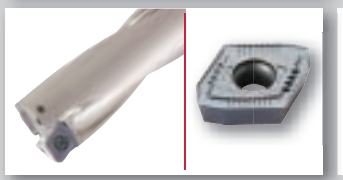


## TUNGSIX-DRILL

E072

Indexable drill with 6-cutting-edged insert for high productivity

**ø20 mm - ø54 mm / L/D = 2, 3, 4**



## TUNGDRILLTWISTED

E080

Indexable drills with 4-cornered inserts for various drilling applications

**ø12.5 mm - ø54 mm / L/D = 2, 3, 4, 5**



## TUNGDRILLBIG

E092

Large-diameter drills with cartridges applicable for both the TungSix-Drill or TungDrill-Twisted inserts

**ø55 mm - ø80 mm / L/D = 2.5**

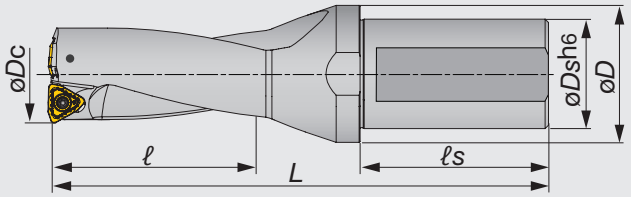


# TUNGSIX-DRILL

## TDS-F L/D=2

L/D = 2, Flat cotter, Tool dia. ø20 - ø54 mm






| Designation | øDc | øDs | øD | ℓ | ℓs | L | Max. offset (radial) | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|
| TDS200F25-2 | 20 | 25 | 32 | 40 | 54 | 115 | 1 | 0.3 | WWMU05X205R-D* |
| TDS205F25-2 | 20.5 | 25 | 32 | 41 | 54 | 116.5 | 0.9 | 0.3 | WWMU05X205R-D* |
| TDS210F25-2 | 21 | 25 | 32 | 42 | 54 | 118 | 0.8 | 0.3 | WWMU05X205R-D* |
| TDS215F25-2 | 21.5 | 25 | 32 | 43 | 54 | 119 | 0.6 | 0.3 | WWMU05X205R-D* |
| TDS220F25-2 | 22 | 25 | 32 | 44 | 54 | 120 | 0.5 | 0.3 | WWMU05X205R-D* |
| TDS225F25-2 | 22.5 | 25 | 37 | 45 | 54 | 121.5 | 0.4 | 0.3 | WWMU05X205R-D* |
| TDS230F25-2 | 23 | 25 | 37 | 46 | 54 | 123 | 0.3 | 0.4 | WWMU05X205R-D* |
| TDS235F25-2 | 23.5 | 25 | 37 | 47 | 54 | 124 | 0.2 | 0.4 | WWMU05X205R-D* |
| TDS240F25-2 | 24 | 25 | 37 | 48 | 54 | 125 | 1.2 | 0.4 | WWMU060306R-D* |
| TDS245F25-2 | 24.5 | 25 | 37 | 49 | 54 | 126.5 | 1 | 0.4 | WWMU060306R-D* |
| TDS250F25-2 | 25 | 25 | 37 | 50 | 54 | 128 | 0.8 | 0.4 | WWMU060306R-D* |
| TDS255F25-2 | 25.5 | 25 | 37 | 51 | 54 | 129.5 | 0.6 | 0.4 | WWMU060306R-D* |
| TDS260F25-2 | 26 | 25 | 37 | 52 | 54 | 131 | 0.5 | 0.4 | WWMU060306R-D* |
| TDS270F32-2 | 27 | 32 | 40 | 54 | 59 | 138 | 0.3 | 0.6 | WWMU060306R-D* |
| TDS280F32-2 | 28 | 32 | 40 | 56 | 59 | 141 | 1.3 | 0.6 | WWMU08X408R-D* |
| TDS290F32-2 | 29 | 32 | 40 | 58 | 59 | 143 | 1.1 | 0.7 | WWMU08X408R-D* |
| TDS300F32-2 | 30 | 32 | 40 | 60 | 59 | 146 | 0.8 | 0.7 | WWMU08X408R-D* |
| TDS310F32-2 | 31 | 32 | 40 | 62 | 59 | 149 | 0.5 | 0.7 | WWMU08X408R-D* |
| TDS320F32-2 | 32 | 32 | 40 | 64 | 59 | 151 | 0.2 | 0.8 | WWMU08X408R-D* |
| TDS330F40-2 | 33 | 40 | 50 | 66 | 69 | 164 | 1.7 | 1.2 | WWMU09X510R-D* |
| TDS340F40-2 | 34 | 40 | 50 | 68 | 69 | 167 | 1.4 | 1.2 | WWMU09X510R-D* |
| TDS350F40-2 | 35 | 40 | 50 | 70 | 69 | 170 | 1.2 | 1.2 | WWMU09X510R-D* |
| TDS360F40-2 | 36 | 40 | 50 | 72 | 69 | 173 | 0.9 | 1.3 | WWMU09X510R-D* |
| TDS370F40-2 | 37 | 40 | 50 | 74 | 69 | 174 | 0.7 | 1.3 | WWMU09X510R-D* |
| TDS380F40-2 | 38 | 40 | 50 | 76 | 69 | 177 | 0.4 | 1.3 | WWMU09X510R-D* |
| TDS390F40-2 | 39 | 40 | 50 | 78 | 69 | 179 | 2.2 | 1.4 | WWMU11X512R-D* |
| TDS400F40-2 | 40 | 40 | 50 | 80 | 69 | 182 | 1.9 | 1.4 | WWMU11X512R-D* |
| TDS410F40-2 | 41 | 40 | 50 | 82 | 69 | 186 | 1.7 | 1.5 | WWMU11X512R-D* |
| TDS420F40-2 | 42 | 40 | 55 | 84 | 69 | 188 | 1.5 | 1.6 | WWMU11X512R-D* |
| TDS430F40-2 | 43 | 40 | 55 | 86 | 69 | 191 | 1.3 | 1.6 | WWMU11X512R-D* |
| TDS440F40-2 | 44 | 40 | 55 | 88 | 69 | 193 | 1 | 1.7 | WWMU11X512R-D* |
| TDS450F40-2 | 45 | 40 | 55 | 90 | 69 | 196 | 0.7 | 1.7 | WWMU11X512R-D* |
| TDS460F40-2 | 46 | 40 | 55 | 92 | 69 | 199 | 0.4 | 1.8 | WWMU11X512R-D* |
| TDS470F40-2 | 47 | 40 | 55 | 94 | 69 | 201 | 2.6 | 1.9 | WWMU13X512R-D* |
| TDS480F40-2 | 48 | 40 | 55 | 96 | 69 | 204 | 2.4 | 1.9 | WWMU13X512R-D* |
| TDS490F40-2 | 49 | 40 | 55 | 98 | 69 | 206 | 2.2 | 1.9 | WWMU13X512R-D* |
| TDS500F40-2 | 50 | 40 | 55 | 100 | 69 | 209 | 2 | 2 | WWMU13X512R-D* |
| TDS510F40-2 | 51 | 40 | 55 | 102 | 69 | 213 | 1.7 | 2.1 | WWMU13X512R-D* |
| TDS520F40-2 | 52 | 40 | 55 | 104 | 69 | 215 | 1.5 | 2.2 | WWMU13X512R-D* |
| TDS530F40-2 | 53 | 40 | 55 | 106 | 69 | 218 | 1.3 | 2.3 | WWMU13X512R-D* |
| TDS540F40-2 | 54 | 40 | 55 | 108 | 69 | 220 | 1 | 2.4 | WWMU13X512R-D* |

### SPARE PARTS





| Designation | Clamping screw | Wrench |
|---|---|---|
| TDS200... - TDS235... | CSPB-2.2 | IP-7D |
| TDS240... - TDS270... | CSPB-2.5 | IP-8D |
| TDS280... - TDS320... | CSTB-3 | T-9D |
| TDS330... - TDS380... | CSTB-4 | T-15D |
| TDS390... - TDS540... | CSTB-5 | T-20D |

| Tool diameter | Tool diameter tolerance | Hole diameter tolerance* |
|---|---|---|
| ø20 - ø27 | + 0.2 / 0 | + 0.25 / 0 |
| ø28 - ø54 | + 0.2 / 0 | + 0.3 / 0 |

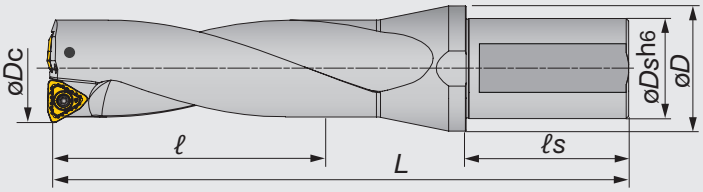
*Just for reference

# TUNGSIX-DRILL

## TDS-F L/D=3

L/D = 3, Flat cotter, Tool dia. ø20 - ø54 mm






| Designation | øDc | øDs | øD | ℓ | ℓs | L | Max. offset (radial) | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|
| TDS200F25-3 | 20 | 25 | 32 | 60 | 54 | 135 | 1 | 0.3 | WWMU05X205R-D* |
| TDS205F25-3 | 20.5 | 25 | 32 | 61.5 | 54 | 136 | 0.9 | 0.3 | WWMU05X205R-D* |
| TDS209F25-3 (1) | 20.9 | 25 | 32 | 62.7 | 54 | 138 | 0.8 | 0.3 | WWMU05X205R-D* |
| TDS210F25-3 | 21 | 25 | 32 | 63 | 54 | 138 | 0.8 | 0.4 | WWMU05X205R-D* |
| TDS215F25-3 | 21.5 | 25 | 32 | 64.5 | 54 | 140 | 0.6 | 0.4 | WWMU05X205R-D* |
| TDS220F25-3 | 22 | 25 | 32 | 66 | 54 | 141 | 0.5 | 0.4 | WWMU05X205R-D* |
| TDSU0875F25-3 (2) | 22.2 | 25 | 32 | 66 | 54 | 141 | 0.4 | 0.4 | WWMU05X205R-D* |
| TDS225F25-3 | 22.5 | 25 | 37 | 67.5 | 54 | 144 | 0.4 | 0.4 | WWMU05X205R-D* |
| TDS230F25-3 | 23 | 25 | 37 | 69 | 54 | 145 | 0.3 | 0.4 | WWMU05X205R-D* |
| TDS235F25-3 | 23.5 | 25 | 37 | 70.5 | 54 | 147 | 0.2 | 0.4 | WWMU05X205R-D* |
| TDS239F25-3 (1) | 23.9 | 25 | 37 | 71.7 | 54 | 149 | 1.2 | 0.4 | WWMU060306R-D* |
| TDS240F25-3 | 24 | 25 | 37 | 72 | 54 | 149 | 1.2 | 0.4 | WWMU060306R-D* |
| TDS245F25-3 | 24.5 | 25 | 37 | 73.5 | 54 | 151 | 1 | 0.5 | WWMU060306R-D* |
| TDS250F25-3 | 25 | 25 | 37 | 75 | 54 | 153 | 0.8 | 0.5 | WWMU060306R-D* |
| TDS255F25-3 | 25.5 | 25 | 37 | 76.5 | 54 | 154 | 0.6 | 0.5 | WWMU060306R-D* |
| TDS260F25-3 (1) | 26 | 25 | 37 | 78 | 54 | 156 | 0.5 | 0.5 | WWMU060306R-D* |
| TDS264F32-3 | 26.4 | 32 | 40 | 79.2 | 59 | 162.5 | 0.4 | 0.6 | WWMU060306R-D* |
| TDS265F32-3 | 26.5 | 32 | 40 | 79.5 | 59 | 162.5 | 0.4 | 0.6 | WWMU060306R-D* |
| TDS270F32-3 | 27 | 32 | 40 | 81 | 59 | 164 | 0.3 | 0.6 | WWMU060306R-D* |
| TDS275F32-3 | 27.5 | 32 | 40 | 82 | 59 | 167 | 0 | 0.6 | WWMU08X408R-D* |
| TDS280F32-3 | 28 | 32 | 40 | 84 | 59 | 168 | 1.3 | 0.7 | WWMU08X408R-D* |
| TDS285F32-3 | 28.5 | 32 | 40 | 85 | 59 | 170 | 1.1 | 0.7 | WWMU08X408R-D* |
| TDSU1125F32-3 (2) | 28.6 | 32 | 40 | 86 | 59 | 171 | 1.1 | 0.7 | WWMU08X408R-D* |
| TDS290F32-3 | 29 | 32 | 40 | 87 | 59 | 171 | 1.1 | 0.7 | WWMU08X408R-D* |
| TDS295F32-3 | 29.5 | 32 | 40 | 88 | 59 | 175 | 0.8 | 0.7 | WWMU08X408R-D* |
| TDS300F32-3 | 30 | 32 | 40 | 90 | 59 | 176 | 0.8 | 0.8 | WWMU08X408R-D* |
| TDS305F32-3 | 30.5 | 32 | 40 | 91 | 59 | 180 | 0.5 | 0.8 | WWMU08X408R-D* |
| TDS310F32-3 | 31 | 32 | 40 | 93 | 59 | 180 | 0.5 | 0.8 | WWMU08X408R-D* |
| TDSU1250F32-3 (2) | 31.8 | 32 | 40 | 95 | 59 | 183 | 0.2 | 0.8 | WWMU08X408R-D* |
| TDS320F32-3 | 32 | 32 | 40 | 96 | 59 | 183 | 0.2 | 0.9 | WWMU08X408R-D* |
| TDS330F40-3 | 33 | 40 | 50 | 99 | 69 | 197 | 1.7 | 1.3 | WWMU09X510R-D* |
| TDS340F40-3 | 34 | 40 | 50 | 102 | 69 | 200 | 1.4 | 1.3 | WWMU09X510R-D* |
| TDS350F40-3 | 35 | 40 | 50 | 105 | 69 | 204 | 1.2 | 1.3 | WWMU09X510R-D* |
| TDS360F40-3 | 36 | 40 | 50 | 108 | 69 | 208 | 0.9 | 1.4 | WWMU09X510R-D* |
| TDS370F40-3 | 37 | 40 | 50 | 111 | 69 | 211 | 0.7 | 1.4 | WWMU09X510R-D* |
| TDS380F40-3 | 38 | 40 | 50 | 114 | 69 | 215 | 0.4 | 1.5 | WWMU09X510R-D* |
| TDS390F40-3 | 39 | 40 | 50 | 117 | 69 | 218 | 2.2 | 1.6 | WWMU11X512R-D* |
| TDS400F40-3 | 40 | 40 | 50 | 120 | 69 | 222 | 1.9 | 1.6 | WWMU11X512R-D* |
| TDS410F40-3 | 41 | 40 | 50 | 123 | 69 | 226 | 1.7 | 1.7 | WWMU11X512R-D* |
| TDS420F40-3 | 42 | 40 | 55 | 126 | 69 | 229 | 1.5 | 1.8 | WWMU11X512R-D* |
| TDS430F40-3 | 43 | 40 | 55 | 129 | 69 | 233 | 1.3 | 1.8 | WWMU11X512R-D* |
| TDS440F40-3 | 44 | 40 | 55 | 132 | 69 | 236 | 1 | 1.9 | WWMU11X512R-D* |
| TDS450F40-3 | 45 | 40 | 55 | 135 | 69 | 241 | 0.7 | 2 | WWMU11X512R-D* |
| TDS460F40-3 | 46 | 40 | 55 | 138 | 69 | 245 | 0.4 | 2.1 | WWMU11X512R-D* |
| TDS470F40-3 | 47 | 40 | 55 | 141 | 69 | 248 | 2.6 | 2.2 | WWMU13X512R-D* |
| TDS480F40-3 | 48 | 40 | 55 | 144 | 69 | 252 | 2.4 | 2.3 | WWMU13X512R-D* |
| TDS490F40-3 | 49 | 40 | 55 | 147 | 69 | 255 | 2.2 | 2.3 | WWMU13X512R-D* |
| TDS500F40-3 | 50 | 40 | 55 | 150 | 69 | 259 | 2 | 2.4 | WWMU13X512R-D* |
| TDS510F40-3 | 51 | 40 | 55 | 153 | 69 | 263 | 1.7 | 2.5 | WWMU13X512R-D* |
| TDS520F40-3 | 52 | 40 | 55 | 156 | 69 | 266 | 1.5 | 2.6 | WWMU13X512R-D* |
| TDS530F40-3 | 53 | 40 | 55 | 159 | 69 | 270 | 1.3 | 2.7 | WWMU13X512R-D* |
| TDS540F40-3 | 54 | 40 | 55 | 162 | 69 | 273 | 1 | 2.9 | WWMU13X512R-D* |

(1) For pre thread hole (mm): øDc = 20.9 mm: M24x3, øDc = 23.9 mm: M27x3, øDc = 26.4 mm: M30x3.5
(2) For inch size: øDc: 22.2 mm = 0.875", øDc: 28.6 mm = 1.125", øDc: 31.8 mm = 1.250"

### SPARE PARTS





| Designation | Clamping screw | Wrench |
|---|---|---|
| TDS200... - TDS235... | CSPB-2.2 | IP-7D |
| TDS240... - TDS270... | CSPB-2.5 | IP-8D |
| TDS280... - TDS320... | CSTB-3 | T-9D |
| TDS330... - TDS380... | CSTB-4 | T-15D |
| TDS390... - TDS540... | CSTB-5 | T-20D |

| Tool diameter | Tool diameter tolerance | Hole diameter tolerance* |
|---|---|---|
| ø20 - ø27 | + 0.2 / 0 | + 0.25 / 0 |
| ø28 - ø54 | + 0.2 / 0 | + 0.3 / 0 |

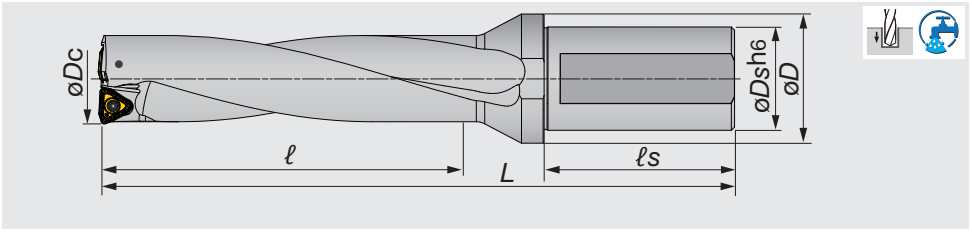
*Just for reference

# TUNGSIX-DRILL

## TDS-F L/D=4

L/D = 4, Flat cotter, Tool dia. ø20 - ø54 mm






| Designation | øDc | øDs | øD | ℓ | ℓs | L | Max. offset (radial) | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|
| TDS200F25-4 | 20 | 25 | 32 | 80 | 54 | 155 | 1 | 0.4 | WWMU05X205R-D* |
| TDS205F25-4 | 20.5 | 25 | 32 | 82 | 54 | 157 | 0.9 | 0.4 | WWMU05X205R-D* |
| TDS210F25-4 | 21 | 25 | 32 | 84 | 54 | 159 | 0.8 | 0.4 | WWMU05X205R-D* |
| TDS215F25-4 | 21.5 | 25 | 32 | 86 | 54 | 161 | 0.6 | 0.4 | WWMU05X205R-D* |
| TDS220F25-4 | 22 | 25 | 32 | 88 | 54 | 163 | 0.5 | 0.4 | WWMU05X205R-D* |
| TDS225F25-4 | 22.5 | 25 | 37 | 90 | 54 | 165.5 | 0.4 | 0.4 | WWMU05X205R-D* |
| TDS230F25-4 | 23 | 25 | 37 | 92 | 54 | 168 | 0.3 | 0.4 | WWMU05X205R-D* |
| TDS235F25-4 | 23.5 | 25 | 37 | 94 | 54 | 170.5 | 0.2 | 0.5 | WWMU05X205R-D* |
| TDS240F25-4 | 24 | 25 | 37 | 96 | 54 | 173 | 1.2 | 0.5 | WWMU060306R-D* |
| TDS245F25-4 | 24.5 | 25 | 37 | 98 | 54 | 175.5 | 1 | 0.5 | WWMU060306R-D* |
| TDS250F25-4 | 25 | 25 | 37 | 100 | 54 | 178 | 0.8 | 0.5 | WWMU060306R-D* |
| TDS255F25-4 | 25.5 | 25 | 37 | 102 | 54 | 180 | 0.6 | 0.6 | WWMU060306R-D* |
| TDS260F25-4 | 26 | 25 | 37 | 104 | 54 | 182 | 0.5 | 0.5 | WWMU060306R-D* |
| TDS270F32-4 | 27 | 32 | 40 | 108 | 59 | 191 | 0.3 | 0.7 | WWMU060306R-D* |
| TDS280F32-4 | 28 | 32 | 40 | 112 | 59 | 196 | 1.3 | 0.8 | WWMU08X408R-D* |
| TDS290F32-4 | 29 | 32 | 40 | 116 | 59 | 200 | 1.1 | 0.8 | WWMU08X408R-D* |
| TDS300F32-4 | 30 | 32 | 40 | 120 | 59 | 206 | 0.8 | 0.9 | WWMU08X408R-D* |
| TDS310F32-4 | 31 | 32 | 40 | 124 | 59 | 211 | 0.5 | 0.9 | WWMU08X408R-D* |
| TDS320F32-4 | 32 | 32 | 40 | 128 | 59 | 215 | 0.2 | 1 | WWMU08X408R-D* |
| TDS330F40-4 | 33 | 40 | 50 | 132 | 69 | 230 | 1.7 | 1.4 | WWMU09X510R-D* |
| TDS340F40-4 | 34 | 40 | 50 | 136 | 69 | 234 | 1.4 | 1.4 | WWMU09X510R-D* |
| TDS350F40-4 | 35 | 40 | 50 | 140 | 69 | 239 | 1.2 | 1.4 | WWMU09X510R-D* |
| TDS360F40-4 | 36 | 40 | 50 | 144 | 69 | 244 | 0.9 | 1.5 | WWMU09X510R-D* |
| TDS370F40-4 | 37 | 40 | 50 | 148 | 69 | 248 | 0.7 | 1.5 | WWMU09X510R-D* |
| TDS380F40-4 | 38 | 40 | 50 | 152 | 69 | 253 | 0.4 | 1.7 | WWMU09X510R-D* |
| TDS390F40-4 | 39 | 40 | 50 | 156 | 69 | 257.5 | 2.2 | 1.8 | WWMU11X512R-D* |
| TDS400F40-4 | 40 | 40 | 50 | 160 | 69 | 262.5 | 1.9 | 1.8 | WWMU11X512R-D* |
| TDS410F40-4 | 41 | 40 | 50 | 164 | 69 | 267.5 | 1.7 | 1.9 | WWMU11X512R-D* |
| TDS420F40-4 | 42 | 40 | 55 | 168 | 69 | 271.5 | 1.5 | 2 | WWMU11X512R-D* |
| TDS430F40-4 | 43 | 40 | 55 | 172 | 69 | 276.5 | 1.3 | 2 | WWMU11X512R-D* |
| TDS440F40-4 | 44 | 40 | 55 | 176 | 69 | 280.5 | 1 | 2.1 | WWMU11X512R-D* |
| TDS450F40-4 | 45 | 40 | 55 | 180 | 69 | 286.5 | 0.7 | 2.3 | WWMU11X512R-D* |
| TDS460F40-4 | 46 | 40 | 55 | 184 | 69 | 291.5 | 0.4 | 2.4 | WWMU11X512R-D* |
| TDS470F40-4 | 47 | 40 | 55 | 188 | 69 | 295.5 | 2.6 | 2.5 | WWMU13X512R-D* |
| TDS480F40-4 | 48 | 40 | 55 | 192 | 69 | 300.5 | 2.4 | 2.7 | WWMU13X512R-D* |
| TDS490F40-4 | 49 | 40 | 55 | 196 | 69 | 304.5 | 2.2 | 2.7 | WWMU13X512R-D* |
| TDS500F40-4 | 50 | 40 | 55 | 200 | 69 | 309.5 | 2 | 2.8 | WWMU13X512R-D* |
| TDS510F40-4 | 51 | 40 | 55 | 204 | 69 | 314.5 | 1.7 | 2.9 | WWMU13X512R-D* |
| TDS520F40-4 | 52 | 40 | 55 | 208 | 69 | 318.5 | 1.5 | 3 | WWMU13X512R-D* |
| TDS530F40-4 | 53 | 40 | 55 | 212 | 69 | 323.5 | 1.3 | 3.1 | WWMU13X512R-D* |
| TDS540F40-4 | 54 | 40 | 55 | 216 | 69 | 327.5 | 1 | 3.4 | WWMU13X512R-D* |

### SPARE PARTS




| Designation | Clamping screw | Wrench |
|---|---|---|
| TDS200... - TDS235... | CSPB-2.2 | IP-7D |
| TDS240... - TDS270... | CSPB-2.5 | IP-8D |
| TDS280... - TDS320... | CSTB-3 | T-9D |
| TDS330... - TDS380... | CSTB-4 | T-15D |
| TDS390... - TDS540... | CSTB-5 | T-20D |

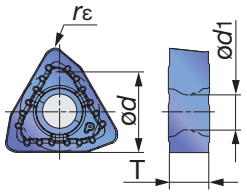
| Tool diameter | Tool diameter tolerance | Hole diameter tolerance * |
|---|---|---|
| ø20 - ø27 | + 0.2 / 0 | + 0.3 / 0 |
| ø28 - ø54 | + 0.2 / 0 | + 0.35 / 0 |

*Just for reference

## INSERT

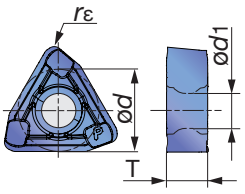
### DJ






### DS



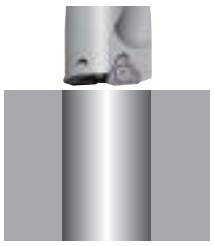
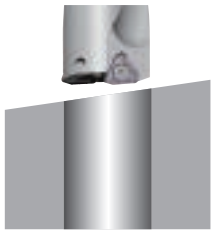
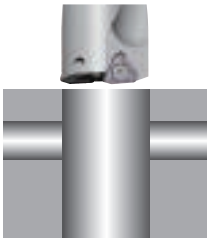
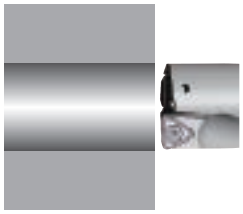
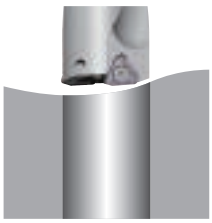
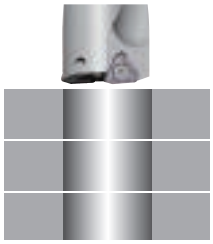



| Designation | Coating | | ød | T | ød1 | rε | øDc |
|---|---|---|---|---|---|---|---|
| | AH9030 | AH6030 | | | | | |
| WWMU05X205R-DJ | ● | | 5.8 | 2.4 | 2.5 | 0.5 | ø20 - ø23.5 |
| WWMU060306R-DJ | ● | | 6.7 | 2.9 | 3 | 0.6 | ø23.9 - ø27 |
| WWMU08X408R-DJ | ● | | 8 | 3.9 | 3.4 | 0.8 | ø28 - ø32 |
| WWMU09X510R-DJ | ● | | 9.7 | 4.9 | 4.4 | 1 | ø33 - ø38 |
| WWMU11X512R-DJ | ● | | 11.3 | 5.7 | 5.5 | 1.2 | ø39 - ø46 |
| WWMU13X512R-DJ | ● | | 13 | 5.7 | 5.5 | 1.2 | ø47 - ø54 |
| WWMU05X205R-DS | | ● | 5.8 | 2.4 | 2.5 | 0.5 | ø20 - ø23.5 |
| WWMU060306R-DS | | ● | 6.7 | 2.9 | 3 | 0.6 | ø23.9 - ø27 |
| WWMU08X408R-DS | | ● | 8 | 3.9 | 3.4 | 0.8 | ø28 - ø32 |
| WWMU09X510R-DS | | ● | 9.7 | 4.9 | 4.4 | 1 | ø33 - ø38 |
| WWMU11X512R-DS | | ● | 11.3 | 5.7 | 5.5 | 1.2 | ø39 - ø46 |
| WWMU13X512R-DS | | ● | 13 | 5.7 | 5.5 | 1.2 | ø47 - ø54 |

● : Line-up

## APPLICATION RANGE

*In case of Interrupted cutting, feed should be decreased.

| Feed f (mm/rev) | * | 0.05 | 0.05 | 0.05 |
|---|---|---|---|---|
| Application | OK Plane surface  | OK Slant surface  | OK Cross hole  | OK Plunging  |
| **Feed f (mm/rev)** | **0.1** | **0.05** | **Disapprove** | **Disapprove** |
| Application | OK Boring  | OK Round surface  | ✕ Stacked plate  | ✕ Back boring  |

*Please see the next page for cutting conditions.

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Selection criteria | Chip-breaker | Grades | Cutting speed *Vc* (m/min) |
|---|---|---|---|---|---|
| P | Low carbon steels (C < 0.3)<br>E275A, E355D, C25, etc. | First choice | DS | AH6030 | 160 - 250 |
| | | Priority on wear resistance | DJ | AH9030 | 160 - 320 |
| | Carbon steels (C > 0.3)<br>C45, C55, etc. | First choice | DJ | AH9030 | 80 - 250 |
| | | Priority on impact resistance | DS | AH6030 | 80 - 250 |
| | Low alloy steels<br>18CrMo4, etc. | First choice | DS | AH6030 | 160 - 250 |
| | | Priority on wear resistance | DJ | AH9030 | 160 - 250 |
| | Alloy steels<br>42CrMo4, 20Cr4, etc. | First choice | DJ | AH9030 | 80 - 200 |
| | | Priority on impact resistance | DS | AH6030 | 80 - 200 |
| M | Stainless steels (Austenitic)<br>X5CrNi18-9, X5CrNiMo17-12-2, etc. | First choice | DS | AH6030 | 100 - 200 |
| | | - | DJ | AH9030 | 100 - 200 |
| | Stainless steels (Martensitic and ferritic)<br>X6Cr17, X20Cr13, etc. | First choice | DS | AH6030 | 100 - 200 |
| | | - | DJ | AH9030 | 100 - 200 |
| | Stainless steels (Precipitation hardening)<br>X5CrNiCuNb16-4, etc. | First choice | DS | AH6030 | 80 - 120 |
| | | - | DJ | AH9030 | 80 - 120 |
| K | Grey cast irons<br>250, etc. | First choice | DJ | AH9030 | 80 - 250 |
| | | Priority on impact resistance | DS | AH6030 | 80 - 200 |
| | Ductile cast irons<br>600-3, etc. | First choice | DJ | AH9030 | 80 - 200 |
| | | Priority on impact resistance | DS | AH6030 | 80 - 150 |
| N | Aluminium alloys | First choice | DS | AH6030 | 200 - 400 |
| | | - | DJ | AH9030 | 200 - 400 |
| S | High-resistant alloys<br>Inconel718, etc. | First choice | DS | AH6030 | 20 - 60 |
| | | - | DJ | AH9030 | 20 - 60 |
| | Titanium alloys<br>Ti-6Al-4V, etc. | First choice | DS | AH6030 | 40 - 120 |
| | | - | DJ | AH9030 | 40 - 120 |
| H | High hardened steels<br>Over 40HRC | First choice | DJ | AH9030 | 50 - 100 |
| | | Priority on impact resistance | DS | AH6030 | 40 - 80 |

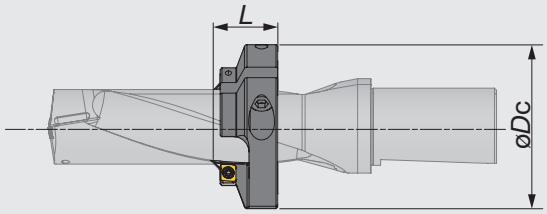
Feed: *f* (mm/rev)

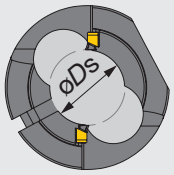
| L/D = 2, 3 | | | L/D = 4 | | |
|---|---|---|---|---|---|
| ø*D*c (mm) | | | ø*D*c (mm) | | |
| ø20 - ø27.5 | ø28 - ø38 | ø39 - ø54 | ø20 - ø27 | ø28 - ø38 | ø39 - ø54 |
| 0.04 - 0.1 | 0.04 - 0.1 | 0.04 - 0.1 | 0.04- 0.1 | 0.04 - 0.1 | 0.04 - 0.1 |
| 0.04 - 0.1 | 0.04 - 0.1 | 0.04 - 0.1 | 0.04 - 0.1 | 0.04 - 0.1 | 0.04 - 0.1 |
| 0.06 - 0.15 | 0.06 - 0.16 | 0.08 - 0.18 | 0.06 - 0.15 | 0.06 - 0.15 | 0.08 - 0.17 |
| 0.04 - 0.12 | 0.04 - 0.13 | 0.04 - 0.15 | 0.04 - 0.12 | 0.04 - 0.13 | 0.04 - 0.15 |
| 0.04 - 0.12 | 0.04 - 0.12 | 0.04 - 0.12 | 0.04 - 0.12 | 0.04 - 0.12 | 0.04 - 0.12 |
| 0.06 - 0.12 | 0.06 - 0.14 | 0.06 - 0.14 | 0.06 - 0.12 | 0.06 - 0.14 | 0.06 - 0.14 |
| 0.06 - 0.15 | 0.06 - 0.16 | 0.08 - 0.18 | 0.06 - 0.15 | 0.06 - 0.15 | 0.08 - 0.17 |
| 0.04 - 0.12 | 0.04 - 0.13 | 0.04 - 0.15 | 0.04 - 0.12 | 0.04 - 0.13 | 0.04 - 0.15 |
| 0.04 - 0.1 | 0.04 - 0.12 | 0.04 - 0.12 | 0.04 - 0.12 | 0.04 - 0.12 | 0.04 - 0.12 |
| 0.04 - 0.1 | 0.04 - 0.12 | 0.04 - 0.12 | 0.04 - 0.12 | 0.04 - 0.12 | 0.04 - 0.12 |
| 0.04 - 0.1 | 0.04 - 0.12 | 0.04 - 0.12 | 0.04 - 0.12 | 0.04 - 0.12 | 0.04 - 0.12 |
| 0.04 - 0.1 | 0.04 - 0.12 | 0.04 - 0.12 | 0.04 - 0.12 | 0.04 - 0.12 | 0.04 - 0.12 |
| 0.04 - 0.1 | 0.04 - 0.1 | 0.04 - 0.1 | 0.04 - 0.1 | 0.04 - 0.1 | 0.04 - 0.1 |
| 0.04 - 0.1 | 0.04 - 0.10 | 0.04 - 0.1 | 0.04 - 0.1 | 0.04 - 0.1 | 0.04 - 0.1 |
| 0.06 - 0.15 | 0.06 - 0.18 | 0.08 - 0.2 | 0.06 - 0.15 | 0.06 - 0.16 | 0.08 - 0.18 |
| 0.06 - 0.13 | 0.06 - 0.16 | 0.08 - 0.18 | 0.06 - 0.13 | 0.06 - 0.16 | 0.08 - 0.18 |
| 0.06 - 0.15 | 0.06 - 0.18 | 0.08 - 0.2 | 0.06 - 0.15 | 0.06 - 0.16 | 0.08 - 0.18 |
| 0.06 - 0.13 | 0.06 - 0.16 | 0.08 - 0.18 | 0.06 - 0.13 | 0.06 - 0.16 | 0.08 - 0.18 |
| 0.10 - 0.18 | 0.1 - 0.2 | 0.1 - 0.25 | 0.1 - 0.18 | 0.1 - 0.2 | 0.1 - 0.2 |
| 0.10 - 0.18 | 0.1 - 0.2 | 0.1 - 0.25 | 0.1 - 0.18 | 0.1 - 0.2 | 0.1 - 0.2 |
| 0.04 - 0.08 | 0.04 - 0.08 | 0.04 - 0.1 | 0.04 - 0.1 | 0.04 - 0.1 | 0.04 - 0.1 |
| 0.04 - 0.08 | 0.04 - 0.08 | 0.04 - 0.1 | 0.04 - 0.1 | 0.04 - 0.1 | 0.04 - 0.1 |
| 0.06 - 0.1 | 0.06 - 0.12 | 0.06 - 0.14 | 0.06 - 0.14 | 0.06 - 0.14 | 0.06 - 0.14 |
| 0.06 - 0.1 | 0.06 - 0.12 | 0.06 - 0.14 | 0.06 - 0.14 | 0.06 - 0.14 | 0.06 - 0.14 |
| 0.04 - 0.08 | 0.04 - 0.08 | 0.04 - 0.1 | 0.04 - 0.08 | 0.04 - 0.08 | 0.04 - 0.08 |
| 0.04 - 0.08 | 0.04 - 0.08 | 0.04 - 0.1 | 0.04 - 0.08 | 0.04 - 0.08 | 0.04 - 0.08 |

# TDXCF chamfering tool

Chamfering tool for "TungDrillTwisted" & "TungSix-Drill"

**For flat cotter**




| Designation | øDs | øDc | L | Drill | L/D = 2 | L/D = 3 | L/D = 4 |
|---|---|---|---|---|---|---|---|
| TDXCF200L25 | 19.1 | 49 | 25 | TDS200*25-* | 24.5 | 44.5 | 64.5 |
| TDXCF210L25 | 20.1 | 49 | 25 | TDS205*25-* | 25.7 | 46.2 | 66.7 |
| TDXCF210L25 | 20.1 | 49 | 25 | TDS210*25-* | 26.8 | 47.8 | 68.8 |
| TDXCF220L25 | 21.1 | 49 | 25 | TDS215*25-* | 28 | 49.5 | 71 |
| TDXCF220L25 | 21.1 | 49 | 25 | TDS220*25-* | 29.1 | 51.1 | 73.1 |
| TDXCF230L25 | 22.1 | 49 | 25 | TDS225*25-* | 30.3 | 52.8 | 75.3 |
| TDXCF230L25 | 22.1 | 49 | 25 | TDS230*25-* | 31.4 | 54.4 | 77.4 |
| TDXCF240L25 | 23.1 | 49 | 25 | TDS235*25-* | 32.6 | 56.1 | 79.6 |
| TDXCF240L25 | 23.1 | 49 | 25 | TDS240*25-* | 33.7 | 57.7 | 81.7 |
| TDXCF250L25 | 23.95 | 49 | 25 | TDS245*25-* | 34.9 | 59.4 | 83.9 |
| TDXCF250L25 | 23.95 | 49 | 25 | TDS250*25-* | 36 | 61 | 86 |
| TDXCF260L30 | 24.95 | 64 | 30 | TDS255*25-* | 32.2 | 57.7 | 83.2 |
| TDXCF260L30 | 24.95 | 64 | 30 | TDS260*25-* | 33.3 | 59.3 | 85.3 |
| TDXCF270L30 | 25.9 | 64 | 30 | TDS270*32-* | 35.6 | 62.6 | 89.6 |
| TDXCF280L30 | 26.9 | 64 | 30 | TDS280*32-* | 37.9 | 65.9 | 93.9 |
| TDXCF290L30 | 27.9 | 64 | 30 | TDS290*32-* | 40.2 | 69.2 | 98.2 |
| TDXCF300L30 | 28.9 | 64 | 30 | TDS300*32-* | 42.5 | 72.5 | 102.5 |
| TDXCF310L30 | 29.9 | 64 | 30 | TDS310*32-* | 44.8 | 75.8 | 106.8 |
| TDXCF320L30 | 30.9 | 64 | 30 | TDS320*32-* | 47.1 | 79.1 | 111.1 |

## SPARE PARTS

| Designation | Screw for insert | Screw for ring | Wrench for insert | Wrench for ring |
|---|---|---|---|---|
| TDXCF130 - 230 | CSPB-4S | CM6X16 | IP-15D | P-5 |
| TDXCF260 - 540 | CSPB-4S | CM8X1.25X20-A | IP-15D | P-6 |



## INSERT

### XHGX-45A



| Designation | GH130 | Torque (N·m) |
|---|---|---|
| XHGX090700R-45A | ● | 3.5 |

## Caution in mounting the chamfering tool on the drill body

① Place the ring on the drill body and match the positions of flutes on drill and ring. Temporarily clamp the ring with the ring screw tightened lightly.

② Place the inserts, and tighten the insert screw lightly.

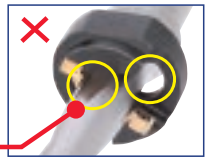
③ Adjust the ring position with a presetter, height gauge, or Vernier caliper, and securely tighten the ring screw, then the insert screw.



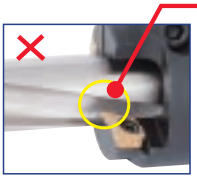

**Match the positions of flutes on drill and ring.**

(Inserts will be automatically set to the right positions.)

**The cutting edge of the insert is in the ring flute.**



**The flutes on drill and ring do not match.**

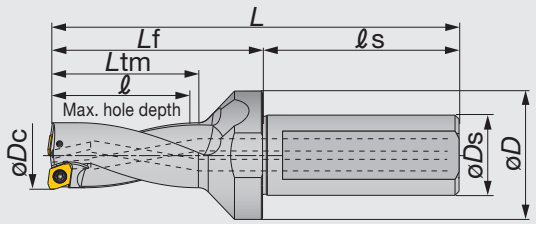


MEMO

## TDX-F L/D=2

L/D = 2, Flat cotter, Tool dia. ø12.5 - ø54.0 mm






| Designation | øDc | øDs | øD | ℓ | ℓs | Ltm | Lf | L | Max. offset (radial) | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TDX125F20-2 | 12.5 | 20 | 25 | 25 | 49 | 28 | 41 | 90 | 0.8 | 0.2 | XPMT040104R-D* |
| TDX130F20-2 | 13 | 20 | 25 | 26 | 49 | 29 | 42 | 91 | 0.7 | 0.2 | XPMT040104R-D* |
| TDX135F20-2 | 13.5 | 20 | 25 | 27 | 49 | 30 | 43 | 92 | 0.6 | 0.2 | XPMT040104R-D* |
| TDX140F20-2 | 14 | 20 | 25 | 28 | 49 | 31 | 44 | 93 | 0.5 | 0.2 | XPMT040104R-D* |
| TDX145F20-2 | 14.5 | 20 | 25 | 29 | 49 | 32 | 46 | 95 | 0.4 | 0.2 | XPMT040104R-D* |
| TDX150F20-2 | 15 | 20 | 25 | 30 | 49 | 33 | 47 | 96 | 0.9 | 0.2 | XPMT050204R-D* |
| TDX155F20-2 | 15.5 | 20 | 32 | 31 | 49 | 34 | 49 | 98 | 0.8 | 0.2 | XPMT050204R-D* |
| TDX160F20-2 | 16 | 20 | 32 | 32 | 49 | 35 | 51 | 100 | 0.6 | 0.2 | XPMT050204R-D* |
| TDX165F20-2 | 16.5 | 20 | 32 | 33 | 49 | 36 | 52 | 101 | 0.5 | 0.2 | XPMT050204R-D* |
| TDX170F20-2 | 17 | 20 | 32 | 34 | 49 | 37 | 53 | 102 | 0.4 | 0.2 | XPMT050204R-D* |
| TDX175F25-2 | 17.5 | 25 | 32 | 35 | 54 | 38 | 55 | 109 | 1.2 | 0.3 | XPMT06X308R-D* |
| TDX180F25-2 | 18 | 25 | 32 | 36 | 54 | 39 | 56 | 110 | 1.1 | 0.3 | XPMT06X308R-D* |
| TDX185F25-2 | 18.5 | 25 | 32 | 37 | 54 | 40 | 57 | 111 | 0.9 | 0.3 | XPMT06X308R-D* |
| TDX190F25-2 | 19 | 25 | 32 | 38 | 54 | 41 | 58 | 112 | 0.8 | 0.3 | XPMT06X308R-D* |
| TDX195F25-2 | 19.5 | 25 | 32 | 39 | 54 | 42 | 60 | 114 | 0.7 | 0.3 | XPMT06X308R-D* |
| TDX200F25-2 | 20 | 25 | 32 | 40 | 54 | 45 | 61 | 115 | 0.5 | 0.3 | XPMT06X308R-D* |
| TDX205F25-2 | 20.5 | 25 | 32 | 41 | 54 | 46 | 62.5 | 116.5 | 0.4 | 0.3 | XPMT06X308R-D* |
| TDX210F25-2 | 21 | 25 | 32 | 42 | 54 | 47 | 64 | 118 | 0.3 | 0.3 | XPMT06X308R-D* |
| TDX215F25-2 | 21.5 | 25 | 32 | 43 | 54 | 48 | 65 | 119 | 0.2 | 0.3 | XPMT06X308R-D* |
| TDX220F25-2 | 22 | 25 | 32 | 44 | 54 | 49 | 66 | 120 | 1.2 | 0.3 | XPMT07H308R-D* |
| TDX225F25-2 | 22.5 | 25 | 37 | 45 | 54 | 50 | 67.5 | 121.5 | 1.1 | 0.3 | XPMT07H308R-D* |
| TDX230F25-2 | 23 | 25 | 37 | 46 | 54 | 51 | 69 | 123 | 0.9 | 0.4 | XPMT07H308R-D* |
| TDX235F25-2 | 23.5 | 25 | 37 | 47 | 54 | 52 | 70 | 124 | 0.8 | 0.4 | XPMT07H308R-D* |
| TDX240F25-2 | 24 | 25 | 37 | 48 | 54 | 53 | 71 | 125 | 0.7 | 0.4 | XPMT07H308R-D* |
| TDX245F25-2 | 24.5 | 25 | 37 | 49 | 54 | 54 | 72.5 | 126.5 | 0.5 | 0.4 | XPMT07H308R-D* |
| TDX250F25-2 | 25 | 25 | 37 | 50 | 54 | 55 | 74 | 128 | 0.4 | 0.4 | XPMT07H308R-D* |
| TDX255F25-2 | 25.5 | 25 | 37 | 51 | 54 | 56 | 75.5 | 129.5 | 0.3 | 0.4 | XPMT07H308R-D* |
| TDX260F25-2 | 26 | 25 | 37 | 52 | 54 | 57 | 77 | 131 | 0.2 | 0.4 | XPMT07H308R-D* |
| TDX270F32-2 | 27 | 32 | 40 | 54 | 59 | 59 | 79 | 138 | 1.5 | 0.6 | XPMT08T308R-D* |
| TDX280F32-2 | 28 | 32 | 40 | 56 | 59 | 60.3 | 82.3 | 141.3 | 1.2 | 0.6 | XPMT08T308R-D* |
| TDX290F32-2 | 29 | 32 | 40 | 58 | 59 | 62.3 | 84.3 | 143.3 | 1 | 0.7 | XPMT08T308R-D* |
| TDX300F32-2 | 30 | 32 | 40 | 60 | 59 | 64.3 | 87.3 | 146.3 | 0.7 | 0.7 | XPMT08T308R-D* |
| TDX310F32-2 | 31 | 32 | 40 | 62 | 59 | 66.3 | 90.3 | 149.3 | 0.4 | 0.7 | XPMT08T308R-D* |
| TDX320F32-2 | 32 | 32 | 40 | 64 | 59 | 68.3 | 92.3 | 151.3 | 0.2 | 0.8 | XPMT08T308R-D* |
| TDX330F40-2 | 33 | 40 | 50 | 66 | 69 | 70.6 | 95.6 | 164.6 | 2.3 | 1.2 | XPMT110412R-D* |
| TDX340F40-2 | 34 | 40 | 50 | 68 | 69 | 72.6 | 98.6 | 167.6 | 2.1 | 1.2 | XPMT110412R-D* |
| TDX350F40-2 | 35 | 40 | 50 | 70 | 69 | 74.6 | 101.6 | 170.6 | 1.8 | 1.2 | XPMT110412R-D* |
| TDX360F40-2 | 36 | 40 | 50 | 72 | 69 | 76.6 | 104.6 | 173.6 | 1.5 | 1.3 | XPMT110412R-D* |
| TDX370F40-2 | 37 | 40 | 50 | 74 | 69 | 78.6 | 105.6 | 174.6 | 1.3 | 1.3 | XPMT110412R-D* |
| TDX380F40-2 | 38 | 40 | 50 | 76 | 69 | 80.6 | 108.6 | 177.6 | 1 | 1.3 | XPMT110412R-D* |
| TDX390F40-2 | 39 | 40 | 50 | 78 | 69 | 82.6 | 110.6 | 179.6 | 0.7 | 1.4 | XPMT110412R-D* |
| TDX400F40-2 | 40 | 40 | 50 | 80 | 69 | 84.6 | 113.6 | 182.6 | 0.5 | 1.4 | XPMT110412R-D* |
| TDX410F40-2 | 41 | 40 | 50 | 82 | 69 | 86.6 | 117.6 | 186.6 | 0.2 | 1.5 | XPMT110412R-D* |
| TDX420F40-2 | 42 | 40 | 55 | 84 | 69 | 89 | 120 | 189 | 3.1 | 1.6 | XPMT150512R-D* |
| TDX430F40-2 | 43 | 40 | 55 | 86 | 69 | 91 | 123 | 192 | 2.9 | 1.6 | XPMT150512R-D* |
| TDX440F40-2 | 44 | 40 | 55 | 88 | 69 | 93 | 125 | 194 | 2.6 | 1.7 | XPMT150512R-D* |
| TDX450F40-2 | 45 | 40 | 55 | 90 | 69 | 95 | 128 | 197 | 2.3 | 1.7 | XPMT150512R-D* |
| TDX460F40-2 | 46 | 40 | 55 | 92 | 69 | 97 | 131 | 200 | 2.1 | 1.8 | XPMT150512R-D* |
| TDX470F40-2 | 47 | 40 | 55 | 94 | 69 | 99 | 133 | 202 | 1.8 | 1.9 | XPMT150512R-D* |
| TDX480F40-2 | 48 | 40 | 55 | 96 | 69 | 101 | 136 | 205 | 1.5 | 1.9 | XPMT150512R-D* |
| TDX490F40-2 | 49 | 40 | 55 | 98 | 69 | 103 | 138 | 207 | 1.3 | 1.9 | XPMT150512R-D* |
| TDX500F40-2 | 50 | 40 | 55 | 100 | 69 | 105 | 141 | 210 | 1 | 2 | XPMT150512R-D* |
| TDX510F40-2 | 51 | 40 | 55 | 102 | 69 | 107 | 145 | 214 | 0.7 | 2.1 | XPMT150512R-D* |

| Designation | øDc | øDs | øD | ℓ | ℓs | Ltm | Lf | L | Max. offset (radial) | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TDX520F40-2 | 52 | 40 | 55 | 104 | 69 | 109 | 147 | 216 | 0.5 | 2.2 | XPMT150512R-D* |
| TDX530F40-2 | 53 | 40 | 55 | 106 | 69 | 111 | 150 | 219 | - | 2.3 | XPMT150512R-D* |
| TDX540F40-2 | 54 | 40 | 55 | 108 | 69 | 113 | 152 | 221 | - | 2.4 | XPMT150512R-D* |

| Tool diameter | Tool diameter tolerance | Hole diameter tolerance* |
|---|---|---|
| ø12.5 - ø17 | + 0.1 / 0 | + 0.25 / 0 |
| ø17.5 - ø54 | + 0.2 / 0 | + 0.3 / 0 |

*Just for reference

## SPARE PARTS



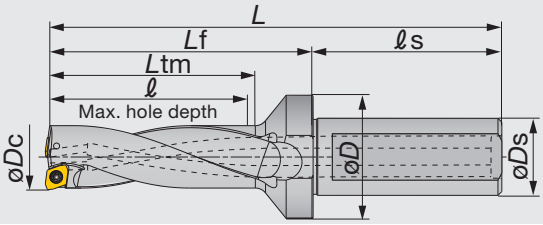


| Designation | Clamping screw | Wrench |
|---|---|---|
| TDX125 - 145 | CSPB-2H | IP-6DB |
| TDX150 - 170 | CSPB-2L043 | IP-6DB |
| TDX175 - 215 | CSPB-2.2 | IP-7D |
| TDX220 - 260 | CSPB-2.5 | IP-8D |
| TDX270 - 320 | CSTB-3 | T-9D |
| TDX330 - 410 | CSTB-4 | T-15D |
| TDX420 - 540 | CSTB-5 | T-20D |

## TDX-F L/D=3

L/D = 3, Flat cotter, Tool dia. ø12.5 - ø54 mm






| Designation | øDc | øDs | øD | ℓ | ℓs | Ltm | Lf | L | Max. offset (radial) | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TDX125F20-3 | 12.5 | 20 | 25 | 37.5 | 49 | 40.5 | 53 | 102 | 0.8 | 0.2 | XPMT040104R-D* |
| TDX130F20-3 | 13 | 20 | 25 | 39 | 49 | 42 | 55 | 104 | 0.7 | 0.2 | XPMT040104R-D* |
| TDX135F20-3 | 13.5 | 20 | 25 | 40.5 | 49 | 43.5 | 56 | 105 | 0.6 | 0.2 | XPMT040104R-D* |
| TDX140F20-3 | 14 | 20 | 25 | 42 | 49 | 45 | 58 | 107 | 0.5 | 0.2 | XPMT040104R-D* |
| TDX145F20-3 | 14.5 | 20 | 25 | 43.5 | 49 | 46.5 | 60 | 109 | 0.4 | 0.2 | XPMT040104R-D* |
| TDX150F20-3 | 15 | 20 | 25 | 45 | 49 | 48 | 62 | 111 | 0.9 | 0.2 | XPMT050204R-D* |
| TDX155F20-3 | 15.5 | 20 | 32 | 46.5 | 49 | 49.5 | 64 | 113 | 0.8 | 0.2 | XPMT050204R-D* |
| TDX160F20-3 | 16 | 20 | 32 | 48 | 49 | 51 | 66 | 115 | 0.6 | 0.2 | XPMT050204R-D* |
| TDX165F20-3 | 16.5 | 20 | 32 | 49.5 | 49 | 52.5 | 68 | 117 | 0.5 | 0.2 | XPMT050204R-D* |
| TDX170F20-3 | 17 | 20 | 32 | 51 | 49 | 54 | 69 | 118 | 0.4 | 0.2 | XPMT050204R-D* |
| TDX175F25-3 | 17.5 | 25 | 32 | 52.5 | 54 | 55.5 | 72 | 126 | 1.2 | 0.3 | XPMT06X308R-D* |
| TDX180F25-3 | 18 | 25 | 32 | 54 | 54 | 57 | 73 | 127 | 1.1 | 0.3 | XPMT06X308R-D* |
| TDX185F25-3 | 18.5 | 25 | 32 | 55.5 | 54 | 58.5 | 75 | 129 | 0.9 | 0.3 | XPMT06X308R-D* |
| TDX190F25-3 | 19 | 25 | 32 | 57 | 54 | 60 | 76 | 130 | 0.8 | 0.3 | XPMT06X308R-D* |
| TDX195F25-3 | 19.5 | 25 | 32 | 58.5 | 54 | 61.5 | 79 | 133 | 0.7 | 0.3 | XPMT06X308R-D* |
| TDX200F25-3 | 20 | 25 | 32 | 60 | 54 | 65 | 81 | 135 | 0.5 | 0.3 | XPMT06X308R-D* |
| TDX205F25-3 | 20.5 | 25 | 32 | 61.5 | 54 | 66.5 | 82 | 136 | 0.4 | 0.3 | XPMT06X308R-D* |
| TDX210F25-3 | 21 | 25 | 32 | 63 | 54 | 68 | 84 | 138 | 0.3 | 0.3 | XPMT06X308R-D* |
| TDX215F25-3 | 21.5 | 25 | 32 | 64.5 | 54 | 69.5 | 86 | 140 | 0.2 | 0.4 | XPMT06X308R-D* |
| TDX220F25-3 | 22 | 25 | 32 | 66 | 54 | 71 | 87 | 141 | 1.2 | 0.4 | XPMT07H308R-D* |
| TDX225F25-3 | 22.5 | 25 | 37 | 67.5 | 54 | 72.5 | 90 | 144 | 1.1 | 0.4 | XPMT07H308R-D* |
| TDX230F25-3 | 23 | 25 | 37 | 69 | 54 | 74 | 91 | 145 | 0.9 | 0.4 | XPMT07H308R-D* |
| TDX235F25-3 | 23.5 | 25 | 37 | 70.5 | 54 | 75.5 | 93 | 147 | 0.8 | 0.4 | XPMT07H308R-D* |
| TDX240F25-3 | 24 | 25 | 37 | 72 | 54 | 77 | 95 | 149 | 0.7 | 0.4 | XPMT07H308R-D* |
| TDX245F25-3 | 24.5 | 25 | 37 | 73.5 | 54 | 78.5 | 97 | 151 | 0.5 | 0.5 | XPMT07H308R-D* |
| TDX250F25-3 | 25 | 25 | 37 | 75 | 54 | 80 | 99 | 153 | 0.4 | 0.5 | XPMT07H308R-D* |
| TDX255F25-3 | 25.5 | 25 | 37 | 76.5 | 54 | 81.5 | 100 | 154 | 0.3 | 0.5 | XPMT07H308R-D* |
| TDX260F25-3 | 26 | 25 | 37 | 78 | 54 | 83 | 102 | 156 | 0.2 | 0.5 | XPMT07H308R-D* |
| TDX270F32-3 | 27 | 32 | 40 | 81 | 59 | 86 | 105 | 164 | 1.5 | 0.6 | XPMT08T308R-D* |
| TDX280F32-3 | 28 | 32 | 40 | 84 | 59 | 88.3 | 109.3 | 168.3 | 1.2 | 0.7 | XPMT08T308R-D* |
| TDX290F32-3 | 29 | 32 | 40 | 87 | 59 | 91.3 | 112.3 | 171.3 | 1 | 0.7 | XPMT08T308R-D* |
| TDX300F32-3 | 30 | 32 | 40 | 90 | 59 | 94.3 | 117.3 | 176.3 | 0.7 | 0.8 | XPMT08T308R-D* |
| TDX310F32-3 | 31 | 32 | 40 | 93 | 59 | 97.3 | 121.3 | 180.3 | 0.4 | 0.8 | XPMT08T308R-D* |
| TDX320F32-3 | 32 | 32 | 40 | 96 | 59 | 100.3 | 124.3 | 183.3 | 0.2 | 0.9 | XPMT08T308R-D* |
| TDX330F40-3 | 33 | 40 | 50 | 99 | 69 | 103.6 | 128.6 | 197.6 | 2.3 | 1.3 | XPMT110412R-D* |
| TDX340F40-3 | 34 | 40 | 50 | 102 | 69 | 106.6 | 131.6 | 200.6 | 2.1 | 1.3 | XPMT110412R-D* |
| TDX350F40-3 | 35 | 40 | 50 | 105 | 69 | 109.6 | 135.6 | 204.6 | 1.8 | 1.3 | XPMT110412R-D* |
| TDX360F40-3 | 36 | 40 | 50 | 108 | 69 | 112.6 | 139.6 | 208.6 | 1.5 | 1.4 | XPMT110412R-D* |
| TDX370F40-3 | 37 | 40 | 50 | 111 | 69 | 115.6 | 142.6 | 211.6 | 1.3 | 1.4 | XPMT110412R-D* |
| TDX380F40-3 | 38 | 40 | 50 | 114 | 69 | 118.6 | 146.6 | 215.6 | 1 | 1.5 | XPMT110412R-D* |
| TDX390F40-3 | 39 | 40 | 50 | 117 | 69 | 121.6 | 149.6 | 218.6 | 0.7 | 1.6 | XPMT110412R-D* |
| TDX400F40-3 | 40 | 40 | 50 | 120 | 69 | 124.6 | 153.6 | 222.6 | 0.5 | 1.6 | XPMT110412R-D* |
| TDX410F40-3 | 41 | 40 | 50 | 123 | 69 | 127.6 | 157.6 | 226.6 | 0.2 | 1.7 | XPMT110412R-D* |
| TDX420F40-3 | 42 | 40 | 55 | 126 | 69 | 131 | 161 | 230 | 3.1 | 1.8 | XPMT150512R-D* |
| TDX430F40-3 | 43 | 40 | 55 | 129 | 69 | 134 | 165 | 234 | 2.9 | 1.8 | XPMT150512R-D* |
| TDX440F40-3 | 44 | 40 | 55 | 132 | 69 | 137 | 168 | 237 | 2.6 | 1.9 | XPMT150512R-D* |
| TDX450F40-3 | 45 | 40 | 55 | 135 | 69 | 140 | 173 | 242 | 2.3 | 2 | XPMT150512R-D* |
| TDX460F40-3 | 46 | 40 | 55 | 138 | 69 | 143 | 177 | 246 | 2.1 | 2.1 | XPMT150512R-D* |
| TDX470F40-3 | 47 | 40 | 55 | 141 | 69 | 146 | 180 | 249 | 1.8 | 2.2 | XPMT150512R-D* |
| TDX480F40-3 | 48 | 40 | 55 | 144 | 69 | 149 | 184 | 253 | 1.5 | 2.3 | XPMT150512R-D* |
| TDX490F40-3 | 49 | 40 | 55 | 147 | 69 | 152 | 187 | 256 | 1.3 | 2.3 | XPMT150512R-D* |
| TDX500F40-3 | 50 | 40 | 55 | 150 | 69 | 155 | 191 | 260 | 1 | 2.4 | XPMT150512R-D* |

| Designation | $øD_C$ | $øD_S$ | $øD$ | $\ell$ | $\ell_S$ | $L$tm | $L_f$ | $L$ | Max. offset (radial) | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TDX510F40-3 | 51 | 40 | 55 | 153 | 69 | 158 | 195 | 264 | 0.7 | 2.5 | XPMT150512R-D* |
| TDX520F40-3 | 52 | 40 | 55 | 156 | 69 | 161 | 198 | 267 | 0.5 | 2.6 | XPMT150512R-D* |
| TDX530F40-3 | 53 | 40 | 55 | 159 | 69 | 164 | 202 | 271 | - | 2.7 | XPMT150512R-D* |
| TDX540F40-3 | 54 | 40 | 55 | 162 | 69 | 167 | 205 | 274 | - | 2.9 | XPMT150512R-D* |

| Tool diameter | Tool diameter tolerance | Hole diameter tolerance* |
|---|---|---|
| ø12.5 - ø17.0 | + 0.1 / 0 | + 0.25 / 0 |
| ø17.5 - ø54.0 | + 0.2 / 0 | + 0.3 / 0 |

*Just for reference

## SPARE PARTS



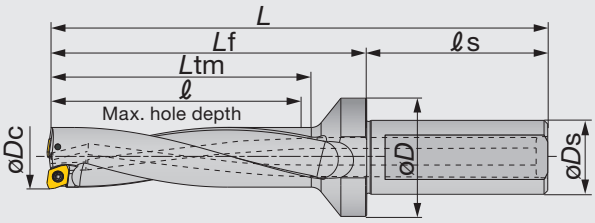


| Designation | Clamping screw | Wrench |
|---|---|---|
| TDX125 - 145 | CSPB-2H | IP-6DB |
| TDX150 - 170 | CSPB-2L043 | IP-6DB |
| TDX175 - 215 | CSPB-2.2 | IP-7D |
| TDX220 - 260 | CSPB-2.5 | IP-8D |
| TDX270 - 320 | CSTB-3 | T-9D |
| TDX330 - 410 | CSTB-4 | T-15D |
| TDX420 - 540 | CSTB-5 | T-20D |

## TDX-F L/D=4

L/D = 4, Flat cotter, Tool dia. ø12.5 - ø54 mm






| Designation | øDc | øDs | øD | ℓ | ℓs | Ltm | Lf | L | Max. offset (radial) | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TDX125F20-4 | 12.5 | 20 | 25 | 50 | 49 | 53 | 66 | 115 | 0.8 | 0.2 | XPMT040104R-D* |
| TDX130F20-4 | 13 | 20 | 25 | 52 | 49 | 55 | 68 | 117 | 0.7 | 0.2 | XPMT040104R-D* |
| TDX135F20-4 | 13.5 | 20 | 25 | 54 | 49 | 57 | 70 | 119 | 0.6 | 0.2 | XPMT040104R-D* |
| TDX140F20-4 | 14 | 20 | 25 | 56 | 49 | 59 | 72 | 121 | 0.5 | 0.2 | XPMT040104R-D* |
| TDX145F20-4 | 14.5 | 20 | 25 | 58 | 49 | 61 | 75 | 124 | 0.4 | 0.2 | XPMT040104R-D* |
| TDX150F20-4 | 15 | 20 | 25 | 60 | 49 | 63 | 77 | 126 | 0.9 | 0.2 | XPMT050204R-D* |
| TDX155F20-4 | 15.5 | 20 | 32 | 62 | 49 | 65 | 79 | 128 | 0.8 | 0.2 | XPMT050204R-D* |
| TDX160F20-4 | 16 | 20 | 32 | 64 | 49 | 67 | 82 | 131 | 0.6 | 0.2 | XPMT050204R-D* |
| TDX165F20-4 | 16.5 | 20 | 32 | 66 | 49 | 69 | 84 | 133 | 0.5 | 0.2 | XPMT050204R-D* |
| TDX170F20-4 | 17 | 20 | 32 | 68 | 49 | 71 | 86 | 135 | 0.4 | 0.2 | XPMT050204R-D* |
| TDX175F25-4 | 17.5 | 25 | 32 | 70 | 54 | 73 | 89 | 143 | 1.2 | 0.3 | XPMT06X308R-D* |
| TDX180F25-4 | 18 | 25 | 32 | 72 | 54 | 75 | 91 | 145 | 1.1 | 0.3 | XPMT06X308R-D* |
| TDX185F25-4 | 18.5 | 25 | 32 | 74 | 54 | 77 | 93 | 147 | 0.9 | 0.3 | XPMT06X308R-D* |
| TDX190F25-4 | 19 | 25 | 32 | 76 | 54 | 79 | 95 | 149 | 0.8 | 0.3 | XPMT06X308R-D* |
| TDX195F25-4 | 19.5 | 25 | 32 | 78 | 54 | 81 | 99 | 153 | 0.7 | 0.4 | XPMT06X308R-D* |
| TDX200F25-4 | 20 | 25 | 32 | 80 | 54 | 84 | 101 | 155 | 0.5 | 0.4 | XPMT06X308R-D* |
| TDX205F25-4 | 20.5 | 25 | 32 | 82 | 54 | 86 | 103 | 157 | 0.4 | 0.4 | XPMT06X308R-D* |
| TDX210F25-4 | 21 | 25 | 32 | 84 | 54 | 88 | 105 | 159 | 0.3 | 0.4 | XPMT06X308R-D* |
| TDX215F25-4 | 21.5 | 25 | 32 | 86 | 54 | 90 | 107 | 161 | 0.2 | 0.4 | XPMT06X308R-D* |
| TDX220F25-4 | 22 | 25 | 32 | 88 | 54 | 92 | 109 | 163 | 1.2 | 0.5 | XPMT07H308R-D* |
| TDX225F25-4 | 22.5 | 25 | 37 | 90 | 54 | 94 | 111.5 | 165.5 | 1.1 | 0.5 | XPMT07H308R-D* |
| TDX230F25-4 | 23 | 25 | 37 | 92 | 54 | 96 | 114 | 168 | 0.9 | 0.4 | XPMT07H308R-D* |
| TDX235F25-4 | 23.5 | 25 | 37 | 94 | 54 | 98 | 116.5 | 170.5 | 0.8 | 0.4 | XPMT07H308R-D* |
| TDX240F25-4 | 24 | 25 | 37 | 96 | 54 | 100 | 119 | 173 | 0.7 | 0.4 | XPMT07H308R-D* |
| TDX245F25-4 | 24.5 | 25 | 37 | 98 | 54 | 102 | 121.5 | 175.5 | 0.5 | 0.6 | XPMT07H308R-D* |
| TDX250F25-4 | 25 | 25 | 37 | 100 | 54 | 104 | 124 | 178 | 0.4 | 0.6 | XPMT07H308R-D* |
| TDX255F25-4 | 25.5 | 25 | 37 | 102 | 54 | 106 | 126 | 180 | 0.3 | 0.6 | XPMT07H308R-D* |
| TDX260F25-4 | 26 | 25 | 37 | 104 | 54 | 108 | 128 | 182 | 0.2 | 0.6 | XPMT07H308R-D* |
| TDX270F32-4 | 27 | 32 | 40 | 108 | 59 | 112 | 132 | 191 | 1.5 | 0.6 | XPMT08T308R-D* |
| TDX280F32-4 | 28 | 32 | 40 | 112 | 59 | 116 | 137 | 196 | 1.2 | 0.8 | XPMT08T308R-D* |
| TDX290F32-4 | 29 | 32 | 40 | 116 | 59 | 120 | 141 | 200 | 1 | 0.7 | XPMT08T308R-D* |
| TDX300F32-4 | 30 | 32 | 40 | 120 | 59 | 124 | 147 | 206 | 0.7 | 0.9 | XPMT08T308R-D* |
| TDX310F32-4 | 31 | 32 | 40 | 124 | 59 | 128 | 152 | 211 | 0.4 | 0.9 | XPMT08T308R-D* |
| TDX320F32-4 | 32 | 32 | 40 | 128 | 59 | 132 | 156 | 215 | 0.2 | 1 | XPMT08T308R-D* |
| TDX330F40-4 | 33 | 40 | 50 | 132 | 69 | 136 | 161 | 230 | 2.3 | 1.4 | XPMT110412R-D* |
| TDX340F40-4 | 34 | 40 | 50 | 136 | 69 | 140 | 165 | 234 | 2.1 | 1.4 | XPMT110412R-D* |
| TDX350F40-4 | 35 | 40 | 50 | 140 | 69 | 144 | 170 | 239 | 1.8 | 1.4 | XPMT110412R-D* |
| TDX360F40-4 | 36 | 40 | 50 | 144 | 69 | 148 | 175 | 244 | 1.5 | 1.5 | XPMT110412R-D* |
| TDX370F40-4 | 37 | 40 | 50 | 148 | 69 | 152 | 179 | 248 | 1.3 | 1.5 | XPMT110412R-D* |
| TDX380F40-4 | 38 | 40 | 50 | 152 | 69 | 156 | 184 | 253 | 1 | 1.7 | XPMT110412R-D* |
| TDX390F40-4 | 39 | 40 | 50 | 156 | 69 | 160 | 188 | 257 | 0.7 | 1.8 | XPMT110412R-D* |
| TDX400F40-4 | 40 | 40 | 50 | 160 | 69 | 164 | 193 | 262 | 0.5 | 1.8 | XPMT110412R-D* |
| TDX410F40-4 | 41 | 40 | 50 | 164 | 69 | 168 | 198 | 267 | 0.2 | 1.9 | XPMT110412R-D* |
| TDX420F40-4 | 42 | 40 | 55 | 168 | 69 | 172 | 202 | 271 | 3.1 | 2 | XPMT150512R-D* |
| TDX430F40-4 | 43 | 40 | 55 | 172 | 69 | 176 | 207 | 276 | 2.9 | 2 | XPMT150512R-D* |
| TDX440F40-4 | 44 | 40 | 55 | 176 | 69 | 180 | 211 | 280 | 2.6 | 2.1 | XPMT150512R-D* |
| TDX450F40-4 | 45 | 40 | 55 | 180 | 69 | 184 | 217 | 286 | 2.3 | 2.3 | XPMT150512R-D* |
| TDX460F40-4 | 46 | 40 | 55 | 184 | 69 | 188 | 222 | 291 | 2.1 | 2.4 | XPMT150512R-D* |
| TDX470F40-4 | 47 | 40 | 55 | 188 | 69 | 192 | 226 | 295 | 1.8 | 2.5 | XPMT150512R-D* |
| TDX480F40-4 | 48 | 40 | 55 | 192 | 69 | 196 | 231 | 300 | 1.5 | 2.7 | XPMT150512R-D* |
| TDX490F40-4 | 49 | 40 | 55 | 196 | 69 | 200 | 235 | 304 | 1.3 | 2.7 | XPMT150512R-D* |
| TDX500F40-4 | 50 | 40 | 55 | 200 | 69 | 204 | 240 | 309 | 1 | 2.8 | XPMT150512R-D* |
| TDX510F40-4 | 51 | 40 | 55 | 204 | 69 | 208 | 245 | 314 | 0.7 | 2.9 | XPMT150512R-D* |

| Designation | øDc | øDs | øD | ℓ | ℓs | Ltm | Lf | L | Max. offset (radial) | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TDX520F40-4 | 52 | 40 | 55 | 208 | 69 | 212 | 249 | 318 | 0.5 | 3 | XPMT150512R-D* |
| TDX530F40-4 | 53 | 40 | 55 | 212 | 69 | 216 | 254 | 323 | - | 3.1 | XPMT150512R-D* |
| TDX540F40-4 | 54 | 40 | 55 | 216 | 69 | 220 | 258 | 327 | - | 3.4 | XPMT150512R-D* |

| Tool diameter | Tool diameter tolerance | Hole diameter tolerance* |
|---|---|---|
| ø12.5 - ø17 | + 0.1 / 0 | + 0.4 / 0 |
| ø17.5 - ø54 | + 0.2 / 0 | + 0.45 / 0 |

*Just for reference

## SPARE PARTS



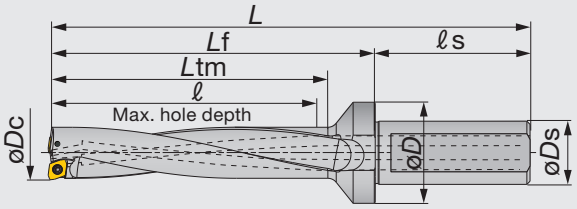


| Designation | Clamping screw | Wrench |
|---|---|---|
| TDX125 - 145 | CSPB-2H | IP-6DB |
| TDX150 - 170 | CSPB-2L043 | IP-6DB |
| TDX175 - 215 | CSPB-2.2 | IP-7D |
| TDX220 - 260 | CSPB-2.5 | IP-8D |
| TDX270 - 320 | CSTB-3 | T-9D |
| TDX330 - 410 | CSTB-4 | T-15D |
| TDX420 - 540 | CSTB-5 | T-20D |

## TDX-F L/D=5

L/D = 5, Flat cotter, Tool dia. ø12.5 - ø54 mm






| Designation | øDc | øDs | øD | ℓ | ℓs | Ltm | Lf | L | Max. offset (radial) | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TDX125F20-5 | 12.5 | 20 | 25 | 62.5 | 49 | 65.5 | 78.5 | 127.5 | 0.8 | 0.2 | XPMT040104R-D* |
| TDX130F20-5 | 13 | 20 | 25 | 65 | 49 | 68 | 81 | 130 | 0.7 | 0.2 | XPMT040104R-D* |
| TDX135F20-5 | 13.5 | 20 | 25 | 67.5 | 49 | 70.5 | 83.5 | 132.5 | 0.6 | 0.2 | XPMT040104R-D* |
| TDX140F20-5 | 14 | 20 | 25 | 70 | 49 | 73 | 86 | 135 | 0.5 | 0.2 | XPMT040104R-D* |
| TDX145F20-5 | 14.5 | 20 | 25 | 72.5 | 49 | 75.5 | 89.5 | 138.5 | 0.4 | 0.2 | XPMT040104R-D* |
| TDX150F20-5 | 15 | 20 | 25 | 75 | 49 | 78 | 92 | 141 | 0.9 | 0.2 | XPMT050204R-D* |
| TDX155F20-5 | 15.5 | 20 | 32 | 77.5 | 49 | 80.5 | 94.5 | 143.5 | 0.8 | 0.2 | XPMT050204R-D* |
| TDX160F20-5 | 16 | 20 | 32 | 80 | 49 | 83 | 98 | 147 | 0.6 | 0.2 | XPMT050204R-D* |
| TDX165F20-5 | 16.5 | 20 | 32 | 82.5 | 49 | 85.5 | 100.5 | 149.5 | 0.5 | 0.2 | XPMT050204R-D* |
| TDX170F20-5 | 17 | 20 | 32 | 85 | 49 | 88 | 103 | 152 | 0.4 | 0.2 | XPMT050204R-D* |
| TDX175F25-5 | 17.5 | 25 | 32 | 87.5 | 54 | 90.5 | 106.5 | 160.5 | 1.2 | 0.3 | XPMT06X308R-D* |
| TDX180F25-5 | 18 | 25 | 32 | 90 | 54 | 93 | 109 | 163 | 1.1 | 0.3 | XPMT06X308R-D* |
| TDX185F25-5 | 18.5 | 25 | 32 | 92.5 | 54 | 95.5 | 111.5 | 165.5 | 0.9 | 0.4 | XPMT06X308R-D* |
| TDX190F25-5 | 19 | 25 | 32 | 95 | 54 | 98 | 114 | 168 | 0.8 | 0.4 | XPMT06X308R-D* |
| TDX195F25-5 | 19.5 | 25 | 32 | 97.5 | 54 | 100.5 | 118.5 | 172.5 | 0.7 | 0.4 | XPMT06X308R-D* |
| TDX200F25-5 | 20 | 25 | 32 | 100 | 54 | 104 | 121 | 175 | 0.5 | 0.4 | XPMT06X308R-D* |
| TDX205F25-5 | 20.5 | 25 | 32 | 102.5 | 54 | 106.5 | 123.5 | 177.5 | 0.4 | 0.4 | XPMT06X308R-D* |
| TDX210F25-5 | 21 | 25 | 32 | 105 | 54 | 109 | 126 | 180 | 0.3 | 0.4 | XPMT06X308R-D* |
| TDX215F25-5 | 21.5 | 25 | 32 | 107.5 | 54 | 111.5 | 128.5 | 182.5 | 0.2 | 0.4 | XPMT06X308R-D* |
| TDX220F25-5 | 22 | 25 | 32 | 110 | 54 | 114 | 131 | 185 | 1.2 | 0.6 | XPMT07H308R-D* |
| TDX225F25-5 | 22.5 | 25 | 37 | 112.5 | 54 | 116.5 | 134 | 188 | 1.1 | 0.6 | XPMT07H308R-D* |
| TDX230F25-5 | 23 | 25 | 37 | 115 | 54 | 119 | 137 | 191 | 0.9 | 0.4 | XPMT07H308R-D* |
| TDX235F25-5 | 23.5 | 25 | 37 | 117.5 | 54 | 121.5 | 140 | 194 | 0.8 | 0.4 | XPMT07H308R-D* |
| TDX240F25-5 | 24 | 25 | 37 | 120 | 54 | 124 | 143 | 197 | 0.7 | 0.4 | XPMT07H308R-D* |
| TDX245F25-5 | 24.5 | 25 | 37 | 122.5 | 54 | 126.5 | 146 | 200 | 0.5 | 0.7 | XPMT07H308R-D* |
| TDX250F25-5 | 25 | 25 | 37 | 125 | 54 | 129 | 149 | 203 | 0.4 | 0.7 | XPMT07H308R-D* |
| TDX255F25-5 | 25.5 | 25 | 37 | 127.5 | 54 | 131.5 | 151.5 | 205.5 | 0.3 | 0.7 | XPMT07H308R-D* |
| TDX260F25-5 | 26 | 25 | 37 | 130 | 54 | 134 | 154 | 208 | 0.2 | 0.7 | XPMT07H308R-D* |
| TDX270F32-5 | 27 | 32 | 40 | 135 | 59 | 139 | 159 | 218 | 1.5 | 0.6 | XPMT08T308R-D* |
| TDX280F32-5 | 28 | 32 | 40 | 140 | 59 | 144 | 165 | 224 | 1.2 | 0.9 | XPMT08T308R-D* |
| TDX290F32-5 | 29 | 32 | 40 | 145 | 59 | 149 | 170 | 229 | 1 | 0.7 | XPMT08T308R-D* |
| TDX300F32-5 | 30 | 32 | 40 | 150 | 59 | 154 | 177 | 236 | 0.7 | 1 | XPMT08T308R-D* |
| TDX310F32-5 | 31 | 32 | 40 | 155 | 59 | 159 | 183 | 242 | 0.4 | 1 | XPMT08T308R-D* |
| TDX320F32-5 | 32 | 32 | 40 | 160 | 59 | 164 | 188 | 247 | 0.2 | 1.1 | XPMT08T308R-D* |
| TDX330F40-5 | 33 | 40 | 50 | 165 | 69 | 169 | 194 | 263 | 2.3 | 1.5 | XPMT110412R-D* |
| TDX340F40-5 | 34 | 40 | 50 | 170 | 69 | 174 | 199 | 268 | 2.1 | 1.5 | XPMT110412R-D* |
| TDX350F40-5 | 35 | 40 | 50 | 175 | 69 | 179 | 205 | 274 | 1.8 | 1.5 | XPMT110412R-D* |
| TDX360F40-5 | 36 | 40 | 50 | 180 | 69 | 184 | 211 | 280 | 1.5 | 1.6 | XPMT110412R-D* |
| TDX370F40-5 | 37 | 40 | 50 | 185 | 69 | 189 | 216 | 285 | 1.3 | 1.6 | XPMT110412R-D* |
| TDX380F40-5 | 38 | 40 | 50 | 190 | 69 | 194 | 222 | 291 | 1 | 1.9 | XPMT110412R-D* |
| TDX390F40-5 | 39 | 40 | 50 | 195 | 69 | 199 | 227 | 296 | 0.7 | 2 | XPMT110412R-D* |
| TDX400F40-5 | 40 | 40 | 50 | 200 | 69 | 204 | 233 | 302 | 0.5 | 2 | XPMT110412R-D* |
| TDX410F40-5 | 41 | 40 | 50 | 205 | 69 | 209 | 239 | 308 | 0.2 | 2.1 | XPMT110412R-D* |
| TDX420F40-5 | 42 | 40 | 55 | 210 | 69 | 214 | 244 | 313 | 3.1 | 2.2 | XPMT150512R-D* |
| TDX430F40-5 | 43 | 40 | 55 | 215 | 69 | 219 | 250 | 319 | 2.9 | 2.2 | XPMT150512R-D* |
| TDX440F40-5 | 44 | 40 | 55 | 220 | 69 | 224 | 255 | 324 | 2.6 | 2.3 | XPMT150512R-D* |
| TDX450F40-5 | 45 | 40 | 55 | 225 | 69 | 229 | 262 | 331 | 2.3 | 2.6 | XPMT150512R-D* |
| TDX460F40-5 | 46 | 40 | 55 | 230 | 69 | 234 | 268 | 337 | 2.1 | 2.7 | XPMT150512R-D* |
| TDX470F40-5 | 47 | 40 | 55 | 235 | 69 | 239 | 273 | 342 | 1.8 | 2.8 | XPMT150512R-D* |
| TDX480F40-5 | 48 | 40 | 55 | 240 | 69 | 244 | 279 | 348 | 1.5 | 3.1 | XPMT150512R-D* |
| TDX490F40-5 | 49 | 40 | 55 | 245 | 69 | 249 | 284 | 353 | 1.3 | 3.1 | XPMT150512R-D* |
| TDX500F40-5 | 50 | 40 | 55 | 250 | 69 | 254 | 290 | 359 | 1 | 3.2 | XPMT150512R-D* |
| TDX510F40-5 | 51 | 40 | 55 | 255 | 69 | 259 | 296 | 365 | 0.7 | 3.3 | XPMT150512R-D* |

| Designation | øDc | øDs | øD | ℓ | ℓs | Ltm | Lf | L | Max. offset (radial) | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TDX520F40-5 | 52 | 40 | 55 | 260 | 69 | 264 | 301 | 370 | 0.5 | 3.4 | XPMT150512R-D* |
| TDX530F40-5 | 53 | 40 | 55 | 265 | 69 | 269 | 307 | 376 | - | 3.5 | XPMT150512R-D* |
| TDX540F40-5 | 54 | 40 | 55 | 270 | 69 | 274 | 312 | 381 | - | 3.9 | XPMT150512R-D* |

| Tool diameter | Tool diameter tolerance | Hole diameter tolerance* |
|---|---|---|
| ø12.5 - ø17 | + 0.1 / 0 | + 0.4 / 0 |
| ø17.5 - ø54 | + 0.2 / 0 | + 0.45 / 0 |

*Just for reference

## SPARE PARTS

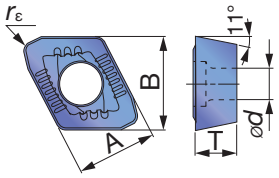




| Designation | Clamping screw | Wrench |
|---|---|---|
| TDX125 - 145 | CSPB-2H | IP-6DB |
| TDX150 - 170 | CSPB-2L043 | IP-6DB |
| TDX175 - 215 | CSPB-2.2 | IP-7D |
| TDX220 - 260 | CSPB-2.5 | IP-8D |
| TDX270 - 320 | CSTB-3 | T-9D |
| TDX330 - 410 | CSTB-4 | T-15D |
| TDX420 - 540 | CSTB-5 | T-20D |

## DJ

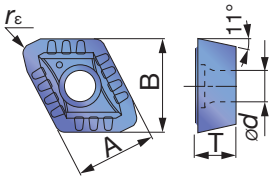





| Designation | Coating | | | | A | B | T | ød | rε | øDc |
|---|---|---|---|---|---|---|---|---|---|---|
| | AH9030 | AH6030 | AH725 | T1115 | | | | | | |
| XPMT040104R-DJ | ● | ● | ● | ● | 4.3 | 4.5 | 1.59 | 2.3 | 0.4 | ø12.5 - ø14.5 |
| XPMT050204R-DJ | ● | ● | ● | ● | 5.2 | 5.4 | 2.38 | 2.3 | 0.4 | ø15 - ø17 |
| XPMT06X308R-DJ | ● | ● | ● | ● | 6 | 7 | 3.15 | 2.5 | 0.8 | ø17.5 - ø21.5 |
| XPMT07H308R-DJ | ● | ● | ● | ● | 7 | 8.2 | 3.6 | 2.8 | 0.8 | ø22 - ø26 |
| XPMT08T308R-DJ | ● | ● | ● | ● | 8.5 | 9.9 | 3.97 | 3.4 | 0.8 | ø27 - ø32 |
| XPMT110412R-DJ | ● | ● | ● | ● | 11.2 | 12.5 | 4.76 | 4.4 | 1.2 | ø33 - ø41 |
| XPMT150512R-DJ | ● | ● | ● | ● | 15 | 16.1 | 5.56 | 5.5 | 1.2 | ø42 - ø54 |

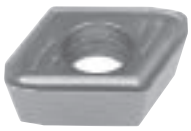
## DS

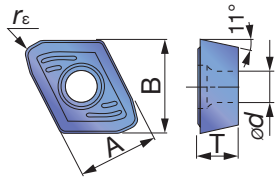





| Designation | Coating | | A | B | T | ød | rε | øDc |
|---|---|---|---|---|---|---|---|---|
| | AH6030 | AH725 | | | | | | |
| XPMT040104R-DS | ● | ● | 4.3 | 4.5 | 1.59 | 2.3 | 0.4 | ø12.5 - ø14.5 |
| XPMT050204R-DS | ● | ● | 5.2 | 5.4 | 2.38 | 2.3 | 0.4 | ø15 - ø17 |
| XPMT06X308R-DS | ● | ● | 6 | 7 | 3.15 | 2.5 | 0.8 | ø17.5 - ø21.5 |
| XPMT07H308R-DS | ● | ● | 7 | 8.2 | 3.6 | 2.8 | 0.8 | ø22 - ø26 |
| XPMT08T308R-DS | ● | ● | 8.5 | 9.9 | 3.97 | 3.4 | 0.8 | ø27 - ø32 |
| XPMT110412R-DS | ● | ● | 11.2 | 12.5 | 4.76 | 4.4 | 1.2 | ø33 - ø41 |
| XPMT150512R-DS | ● | ● | 15 | 16.1 | 5.56 | 5.5 | 1.2 | ø42 - ø54 |

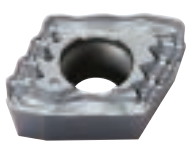
## DW

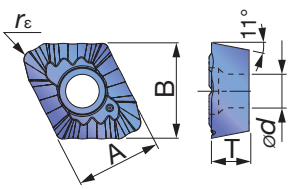





| Designation | Coating | | | A | B | T | ød | rε | øDc |
|---|---|---|---|---|---|---|---|---|---|
| | AH9030 | AH6030 | AH725 | | | | | | |
| XPMT040104R-DW | ● | ● | ● | 4.3 | 4.5 | 1.59 | 2.3 | 0.4 | ø12.5 - ø14.5 |
| XPMT050204R-DW | ● | ● | ● | 5.2 | 5.4 | 2.38 | 2.3 | 0.4 | ø15 - ø17 |
| XPMT06X308R-DW | ● | ● | ● | 6 | 7 | 3.15 | 2.5 | 0.8 | ø17.5 - ø21.5 |
| XPMT07H308R-DW | ● | ● | ● | 7 | 8.2 | 3.6 | 2.8 | 0.8 | ø22 - ø26 |
| XPMT08T308R-DW | ● | ● | ● | 8.5 | 9.9 | 3.97 | 3.4 | 0.8 | ø27 - ø32 |
| XPMT110412R-DW | ● | ● | ● | 11.2 | 12.5 | 4.76 | 4.4 | 1.2 | ø33 - ø41 |
| XPMT150512R-DW | ● | ● | ● | 15 | 16.1 | 5.56 | 5.5 | 1.2 | ø42 - ø54 |

## DG






| Designation | Coating | A | B | T | ød | rε | øDc |
|---|---|---|---|---|---|---|---|
| | AH725 | | | | | | |
| XPMT08T308R-DG | ● | 8.5 | 9.9 | 3.97 | 3.4 | 0.8 | ø27 - ø32 |
| XPMT110412R-DG | ● | 11.2 | 12.5 | 4.76 | 4.4 | 1.2 | ø33 - ø41 |
| XPMT150512R-DG | ● | 15 | 16.1 | 5.56 | 5.5 | 1.2 | ø42 - ø54 |

● : Line - up

## RECOMMENDED INSERT

| ISO | Workpiece material | First choice | High feed | High speed | Troubleshooting | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Chipping resistance | Wear resistance | Surface finish | Chip control |
| P | Low carbon steel (C ≤ 0.3%) | DS, AH6030 | - | - | DS, AH725 | - | DW, AH6030 | DG, AH725 |
| P | Carbon steel (C > 0.3%) Alloy steels | DJ, AH6030 | DW, AH6030 | DJ, AH9030 | DW, AH725 | DJ, AH9030 | DW, AH6030 | - |
| P | Low alloy steel | DS, AH6030 | - | - | DS, AH725 | - | DW, AH6030 | - |
| M | Stainless steel | DS, AH6030 | - | - | DS, AH725 | - | DW, AH6030 | DG, AH725 |
| K | Grey cast iron | DJ, AH9030 | DW, AH9030 | DJ, T1115 | DW, AH725 | - | DW, AH9030 | - |
| K | Ductile cast iron | DJ, AH9030 | DW, AH9030 | - | DW, AH725 | - | DW, AH9030 | - |
| N | Aluminium alloys | DJ, AH725 | DW, AH725 | DS, AH6030 | - | - | DW, AH725 | DG, AH725 |
| S | Titanium alloys Heat-resistant alloys | DS, AH6030 | - | - | DW, AH725 | - | DW, AH725 | DG, AH725 |
| H | Hardened steel | DJ, AH9030 | DW, AH9030 | - | DW, AH725 | - | DW, AH9030 | - |

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Cutting speed *Vc* (m/min) | Series L/D | Feed: *f* (mm/rev) | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | ø12.5 ~ ø14.5 | ø15 ~ ø17 | ø17.5 ~ ø26 | ø27 ~ ø32 | ø33 ~ ø54 |
| P | Low carbon steels (C < 0.3) C15E4, E275A, E355D, etc. | 160 - 320 | 2D, 3D | 0.02 - 0.06 | 0.02 - 0.06 | 0.04 - 0.1 | 0.04 - 0.1 | 0.04 - 0.1 |
| | | | 4D, 5D | 0.02 - 0.06 | 0.02 - 0.06 | 0.04 - 0.1 | 0.04 - 0.1 | 0.04 - 0.1 |
| P | Carbon steels (C > 0.3) C45, C55, etc. | 80 - 250 | 2D, 3D | 0.04 - 0.1 | 0.04 - 0.12 | 0.06 - 0.13 | 0.06 - 0.15 | 0.08 - 0.18 |
| | | | 4D, 5D | 0.04 - 0.08 | 0.04- 0.08 | 0.06 - 0.1 | 0.06 - 0.12 | 0.08 - 0.14 |
| P | Low alloy steels 18CrMo4, etc. | 160 - 250 | 2D, 3D | 0.04 - 0.08 | 0.04 - 0.08 | 0.06 - 0.12 | 0.06 - 0.12 | 0.06 - 0.14 |
| | | | 4D, 5D | 0.04 - 0.08 | 0.04 - 0.08 | 0.06 - 0.12 | 0.06 - 0.12 | 0.06 - 0.14 |
| P | Alloy steels 42CrMo4, 20Cr4, etc. | 80 - 200 | 2D, 3D | 0.04 - 0.1 | 0.04 - 0.12 | 0.06 - 0.13 | 0.06 - 0.15 | 0.08 - 0.18 |
| | | | 4D, 5D | 0.04 - 0.08 | 0.04 - 0.08 | 0.06 - 0.1 | 0.06 - 0.12 | 0.08 - 0.14 |
| M | Stainless steels (Austenitic) X5CrNi18-9, X5CrNiMo17-12-2, etc. | 100 - 200 | 2D, 3D | 0.02 - 0.08 | 0.02 - 0.08 | 0.04 - 0.1 | 0.04 - 0.12 | 0.04 - 0.12 |
| | | | 4D, 5D | 0.02 - 0.08 | 0.02 - 0.08 | 0.04 - 0.1 | 0.04 - 0.12 | 0.04 - 0.12 |
| M | Stainless steels (Martensitic and ferritic) X5CrNi18-9, X5CrNiMo17-12-2, etc. | 100 - 220 | 2D, 3D | 0.02 - 0.08 | 0.02 - 0.08 | 0.04 - 0.1 | 0.04 - 0.12 | 0.04 - 0.12 |
| | | | 4D, 5D | 0.02 - 0.08 | 0.02 - 0.08 | 0.04 - 0.1 | 0.04 - 0.12 | 0.04 - 0.12 |
| M | Stainless steels (Precipitation hardening) X5CrNiCuNb16-4, etc. | 80 - 120 | 2D, 3D | 0.04 - 0.08 | 0.04 - 0.08 | 0.04 - 0.08 | 0.04 - 0.1 | 0.06 - 0.1 |
| | | | 4D, 5D | 0.04 - 0.08 | 0.04 - 0.08 | 0.04 - 0.08 | 0.04 - 0.1 | 0.06 - 0.1 |
| K | Grey cast irons 250, etc. | 80 - 250 | 2D, 3D | 0.06 - 0.12 | 0.06 - 0.12 | 0.06 - 0.15 | 0.06 - 0.18 | 0.08 - 0.2 |
| | | | 4D, 5D | 0.06 - 0.1 | 0.06 - 0.1 | 0.06 - 0.12 | 0.06 - 0.14 | 0.08 - 0.16 |
| K | Ductile cast irons 600-3, etc. | 80 - 200 | 2D, 3D | 0.04 - 0.12 | 0.04 - 0.12 | 0.06 - 0.15 | 0.06 - 0.18 | 0.08 - 0.2 |
| | | | 4D, 5D | 0.04 - 0.1 | 0.04 - 0.1 | 0.06 - 0.12 | 0.06 - 0.14 | 0.08 - 0.16 |
| N | Aluminium alloys AlCu4SiMg, AlSi11Cu3, etc. | 200 - 400 | 2D, 3D | 0.1 - 0.12 | 0.1 - 0.15 | 0.15 - 0.2 | 0.15 - 0.2 | 0.15 - 0.25 |
| | | | 4D, 5D | 0.08 - 0.12 | 0.08 - 0.12 | 0.12 - 0.16 | 0.12 - 0.16 | 0.12 - 0.2 |
| S | Heat-resistant alloys Inconel 718, etc. | 20 - 60 | 2D, 3D | 0.04 - 0.08 | 0.04 - 0.08 | 0.04 - 0.1 | 0.04 - 0.1 | 0.04 - 0.1 |
| | | 20 - 60 | 4D, 5D | 0.04 - 0.08 | 0.04 - 0.08 | 0.04 - 0.1 | 0.04 - 0.1 | 0.04 - 0.1 |
| S | Titanium alloys Ti-6Al-4V, etc. | 40 - 120 | 2D, 3D | 0.06 - 0.1 | 0.06 - 0.1 | 0.06 - 0.12 | 0.06 - 0.12 | 0.06 - 0.12 |
| | | 40 - 120 | 4D, 5D | 0.06 - 0.08 | 0.06 - 0.08 | 0.06 - 0.1 | 0.06 - 0.1 | 0.06 - 0.1 |
| H | Hardened steel ≥ 40HRC | 40 - 100 | 2D, 3D | 0.04 - 0.08 | 0.04 - 0.08 | 0.04 - 0.1 | 0.04 - 0.1 | 0.04 - 0.1 |
| | | 40 - 100 | 4D, 5D | 0.04 - 0.08 | 0.04 - 0.08 | 0.04 - 0.08 | 0.04 - 0.08 | 0.04 - 0.08 |

## Standard cutting conditions for DG type chipbreaker

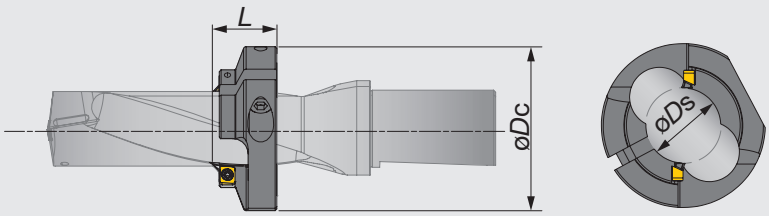
| ISO | Workpiece material | Cutting speed *Vc* (m/min) | Series L/D | Feed: *f* (mm/rev) | |
|---|---|---|---|---|---|
| | | | | ø27 ~ ø32 | ø33 ~ ø54 |
| P | Low carbon steels (C < 0.3) C15E4, E275A, E355D, etc. | 60 - 180 | 2D, 3D<br>4D, 5D | 0.04 - 0.1 | |

- When using the smaller side of the diameter range, the feed rate should be set lower.
- When using DW insert for work materials of 40 HRC, the feed rate should be set below 50%.
- For difficult-to-cut materials (heat-resistant alloys, etc.), the cutting speed should be set 25% below that of carbon steels.
- For high-feed machining, apply a feed rate that is approximately 1.5 times the standard feed conditions.
- High speed machining means cutting speeds over 150 m/min.
- When using DW insert for troubleshooting, use it within the range of standard cutting conditions.
- DG type chipbreaker is suitable for heavy machines that have low-rpm spindles. If chatter occurs, a lower feed rate is recommended.

# TUNGDRILLTWISTED

## TDXCF chamfering tool

Chamfering tool for "TungDrillTwisted" & "TungSix-Drill"




| Designation | øDs | øDc | L | Drill | L/D = 2 | | L/D = 3 | | L/D = 4 | | L/D = 5 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | TDX***F | TDX***W | TDX***F | TDX***W | TDX***F | TDX***W | TDX***F | TDX***W |
| TDXCF180L25 | 17.3 | 49 | 25 | TDX175*25-* | 13 | 18.8 | 30.5 | 36.3 | 48 | 53.8 | 65.5 | 71.3 |
| TDXCF180L25 | 17.3 | 49 | 25 | TDX180*25-* | 14 | 19.9 | 32 | 37.9 | 50 | 55.9 | 68 | 73.9 |
| TDXCF190L25 | 18.1 | 49 | 25 | TDX185*25-* | 15 | 21.1 | 33.5 | 39.6 | 52 | 58.1 | 70.5 | 76.6 |
| TDXCF190L25 | 18.1 | 49 | 25 | TDX190*25-* | 16 | 22.2 | 35 | 41.2 | 54 | 60.2 | 73 | 79.2 |
| TDXCF200L25 | 19.1 | 49 | 25 | TDX195*25-* | 17 | 23.4 | 36.5 | 42.9 | 56 | 62.4 | 75.5 | 81.9 |
| TDXCF200L25 | 19.1 | 49 | 25 | TDX200*25-* | 20 | 24.5 | 40 | 44.5 | 59 | 64.5 | 79 | 84.5 |
| TDXCF210L25 | 20.1 | 49 | 25 | TDX205*25-* | 21 | 25.7 | 41.5 | 46.2 | 61 | 66.7 | 81.5 | 87.2 |
| TDXCF210L25 | 20.1 | 49 | 25 | TDX210*25-* | 22 | 26.8 | 43 | 47.8 | 63 | 68.8 | 84 | 89.8 |
| TDXCF220L25 | 21.1 | 49 | 25 | TDX215*25-* | 23 | 28 | 44.5 | 49.5 | 65 | 71 | 86.5 | 92.5 |
| TDXCF220L25 | 21.1 | 49 | 25 | TDX220*25-* | 24 | 29.1 | 46 | 51.1 | 67 | 73.1 | 89 | 95.1 |
| TDXCF230L25 | 22.1 | 49 | 25 | TDX225*25-* | 25 | 30.3 | 47.5 | 52.8 | 69 | 75.3 | 91.5 | 97.8 |
| TDXCF230L25 | 22.1 | 49 | 25 | TDX230*25-* | 26 | 31.4 | 49 | 54.4 | 71 | 77.4 | 94 | 100.4 |
| TDXCF240L25 | 23.1 | 49 | 25 | TDX235*25-* | 27 | 32.6 | 50.5 | 56.1 | 73 | 79.6 | 96.5 | 103.1 |
| TDXCF240L25 | 23.1 | 49 | 25 | TDX240*25-* | 28 | 33.7 | 52 | 57.7 | 75 | 81.7 | 99 | 105.7 |
| TDXCF250L25 | 23.95 | 49 | 25 | TDX245*25-* | 29 | 34.9 | 53.5 | 59.4 | 77 | 83.9 | 101.5 | 108.4 |
| TDXCF250L25 | 23.95 | 49 | 25 | TDX250*25-* | 30 | 36 | 55 | 61 | 79 | 86 | 104 | 111 |
| TDXCF260L30 | 24.95 | 64 | 30 | TDX255*25-* | 26 | 32.2 | 51.5 | 57.7 | 76 | 83.2 | 101.5 | 108.7 |
| TDXCF260L30 | 24.95 | 64 | 30 | TDX260*25-* | 27 | 33.3 | 53 | 59.3 | 78 | 85.3 | 104 | 111.3 |
| TDXCF270L30 | 25.9 | 64 | 30 | TDX270*32-* | 29 | 35.6 | 56 | 62.6 | 82 | 89.6 | 109 | 116.6 |
| TDXCF280L30 | 26.9 | 64 | 30 | TDX280*32-* | 30.3 | 37.9 | 58.3 | 65.9 | 86 | 93.9 | 114 | 121.9 |
| TDXCF290L30 | 27.9 | 64 | 30 | TDX290*32-* | 32.3 | 40.2 | 61.3 | 69.2 | 90 | 98.2 | 119 | 127.2 |
| TDXCF300L30 | 28.9 | 64 | 30 | TDX300*32-* | 34.3 | 42.5 | 64.3 | 72.5 | 94 | 102.5 | 124 | 132.5 |
| TDXCF310L30 | 29.9 | 64 | 30 | TDX310*32-* | 36.3 | 44.8 | 67.3 | 75.8 | 98 | 106.8 | 129 | 137.8 |
| TDXCF320L30 | 30.9 | 64 | 30 | TDX320*32-* | 38.3 | 47.1 | 70.3 | 79.1 | 102 | 111.1 | 134 | 143.1 |



### SPARE PARTS

| Designation | Screw for insert | Screw for ring | Wrench for insert | Wrench for ring |
|---|---|---|---|---|
| TDXCF130 - 250 | CSPB-4S | CM6X16 | IP-15D | P-5 |
| TDXCF260 - 540 | CSPB-4S | CM8X1.25X20-A | IP-15D | P-6 |

## INSERT

### XHGX-45A



| Designation | GH130 | Torgue (N·m) |
|---|---|---|
| XHGX090700R-45A | ● | 3.5 |

## Caution in mounting the chamfering tool on the drill body

① Place the ring on the drill body and match the positions of flutes on drill and ring. Temporarily clamp the ring with the ring screw tightened lightly.

② Place the inserts, and tighten the insert screw lightly.

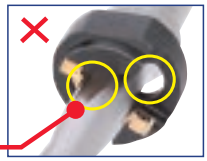
③ Adjust the ring position with a presetter, height gauge, or Vernier caliper, and securely tighten the ring screw, then the insert screw.



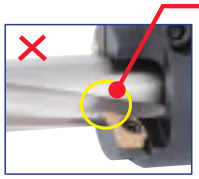

**Match the positions of flutes on drill and ring.**

(Inserts will be automatically set to the right positions.)

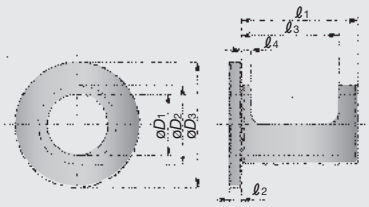
**The cutting edge of the insert is in the ring flute.**



**The flutes on drill and ring do not match.**



Eccentric sleeves for "TungDrillTwisted" & "TungSix-Drill"




| Designation | øD1 | øD2 | øD3 | ℓ1 | ℓ2 | ℓ3 | ℓ4 |
|---|---|---|---|---|---|---|---|
| EZ2025 | 20 | 25 | 46 | 49 | 5 | 32.5 | 4 |
| EZ2532 | 25 | 32 | 51 | 52 | 5 | 38 | 4 |
| EZ3240 | 32 | 40 | 54 | 62 | 5 | 43 | 4 |
| EZ4050 | 40 | 50 | 69 | 63 | 5 | 55 | 4 |

SPARE PARTS

| Designation | Wrench |
|---|---|
| EZ... | P-2.5 |

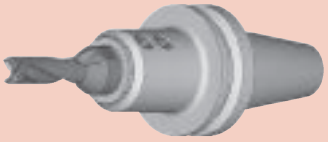
# Use EZ sleeves for the following purposes

## Hole diameter adjustment on the milling machine

### Adjusting the finishing diameter when milling

Adjusting the finishing diameter in tool-rotating applications such as on machining centres and milling machines:

By using EZ sleeve, the finishing diameter can be adjusted in the range from +0.6 mm to -0.2 mm.



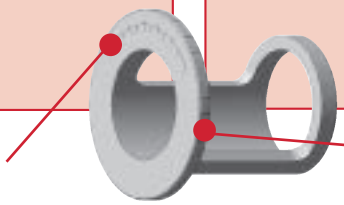
## Adjusting cutting edge height on lathe

### Lathe

Adjusting of the cutting edge height in work rotating applications such as on lathes:

By using EZ sleeve, the cutting edge height can be adjusted in the range from +0.3 mm to -0.2 mm. It results in eliminating troubles caused by improper cutting-edge height.





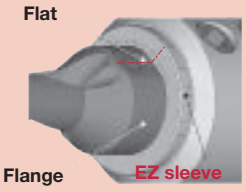
**Scale for adjusting finishing diameter in milling (Periphery of sleeve)**

**Scale for adjusting cutting edge height in turning (Front face of sleeve)**

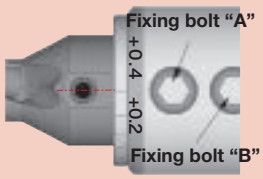
# Setting of EZ sleeve

## Adjusting finishing diameter in milling

As shown in the Figure below, set the EZ sleeve between the drill shank and the toolholder.

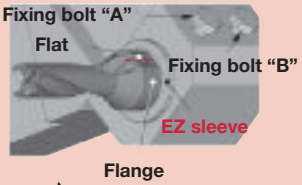



Align the graduated scale on the periphery of the EZ sleeve with the center of the flat of the drill flange.
In the Figure shown below, the sleeve is set so that the finishing diameter will be increased by 0.4 mm.




## Adjusting cutting edge height on lathe

As shown in the Figure below, set the EZ sleeve between the drill shank and the toolblock.




Align the graduated scale on the front face of the Esleeve with the center of the flat of the drill flange.
In the Figure shown below, the sleeve is set so that the center of the drill will shift by 0.1 mm to the plus (+) direction.




**When rotating the EZ sleeve, insert the wrench into the hole at the flange periphery and rotate the EZ sleeve.**
**Screws A + B have to be loosened.**
**Secure the drill by screw A. Secure the EZ sleeve by lightly tightening screw B.**
**Tighten screw B only lightly otherwise EZ sleeve can be damaged!**

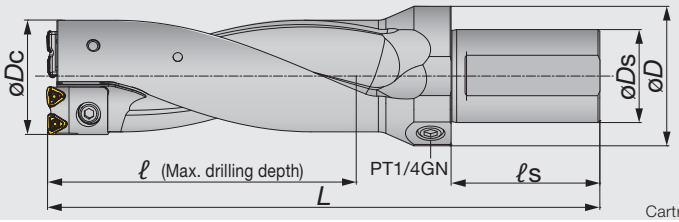
**Cautious points**

- Can not be used for collect chuck holders.
- Over L/D 4 or bigger adjustment, please reduce feed.
- For smaller adjustment, the drill itself will interfere with the hole diameter. It is recommended that hole diameter should be adjusted to a larger diameter than the drill diameter.

# TDB, TDS cartridge set

L/D = 2.5, dia. ø55 - ø80mm, diameter adjustable with setting plate






Cartridge set is sold separately.

| Body Designation | Cartridge set Designation | øDc | øDs | øD | ℓ | ℓs | L | kg | Setting plate Designation | (mm) | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TDB55-56F50-2.5 | TDSCA55-56 | 55 | 50 | 75 | 140 | 80 | 262 | 3.2 | - | - | WWMU08X408R-D* |
| TDB55-56F50-2.5 | TDSCA55-56 | 56 | 50 | 75 | 140 | 80 | 262 | 3.2 | AP0801 | 0.5 | WWMU08X408R-D* |
| TDB57-62F50-2.5 | TDSCA57-62 | 57 | 50 | 75 | 155 | 80 | 282 | 3.6 | - | - | WWMU08X408R-D* |
| TDB57-62F50-2.5 | TDSCA57-62 | 58 | 50 | 75 | 155 | 80 | 282 | 3.6 | AP0801 | 0.5 | WWMU08X408R-D* |
| TDB57-62F50-2.5 | TDSCA57-62 | 59 | 50 | 75 | 155 | 80 | 282 | 3.6 | AP0802 | 1 | WWMU08X408R-D* |
| TDB57-62F50-2.5 | TDSCA57-62 | 60 | 50 | 75 | 155 | 80 | 282 | 3.6 | AP0803 | 1.5 | WWMU08X408R-D* |
| TDB57-62F50-2.5 | TDSCA57-62 | 61 | 50 | 75 | 155 | 80 | 282 | 3.6 | AP0804 | 2 | WWMU08X408R-D* |
| TDB57-62F50-2.5 | TDSCA57-62 | 62 | 50 | 75 | 155 | 80 | 282 | 3.6 | AP0805 | 2.5 | WWMU08X408R-D* |
| TDB63-66F50-2.5 | TDSCA63-66 | 63 | 50 | 75 | 165 | 80 | 297 | 4.2 | - | - | WWMU08X408R-D* |
| TDB63-66F50-2.5 | TDSCA63-66 | 64 | 50 | 75 | 165 | 80 | 297 | 4.2 | AP0801 | 0.5 | WWMU08X408R-D* |
| TDB63-66F50-2.5 | TDSCA63-66 | 65 | 50 | 75 | 165 | 80 | 297 | 4.2 | AP0802 | 1 | WWMU08X408R-D* |
| TDB63-66F50-2.5 | TDSCA63-66 | 66 | 50 | 75 | 165 | 80 | 297 | 4.2 | AP0803 | 1.5 | WWMU08X408R-D* |
| TDB67-73F50-2.5 | TDSCA67-73 | 67 | 50 | 75 | 183 | 80 | 322 | 5 | - | - | WWMU09X510R-D* |
| TDB67-73F50-2.5 | TDSCA67-73 | 68 | 50 | 75 | 183 | 80 | 322 | 5 | AP1101 | 0.5 | WWMU09X510R-D* |
| TDB67-73F50-2.5 | TDSCA67-73 | 69 | 50 | 75 | 183 | 80 | 322 | 5 | AP1102 | 1 | WWMU09X510R-D* |
| TDB67-73F50-2.5 | TDSCA67-73 | 70 | 50 | 75 | 183 | 80 | 322 | 5 | AP1103 | 1.5 | WWMU09X510R-D* |
| TDB67-73F50-2.5 | TDSCA67-73 | 71 | 50 | 75 | 183 | 80 | 322 | 5 | AP1104 | 2 | WWMU09X510R-D* |
| TDB67-73F50-2.5 | TDSCA67-73 | 72 | 50 | 75 | 183 | 80 | 322 | 5 | AP1105 | 2.5 | WWMU09X510R-D* |
| TDB67-73F50-2.5 | TDSCA67-73 | 73 | 50 | 75 | 183 | 80 | 322 | 5 | AP1106 | 3 | WWMU09X510R-D* |
| TDB74-80F50-2.5 | TDSCA74-80 | 74 | 50 | 75 | 200 | 80 | 333 | 5.7 | - | - | WWMU11X512R-D* |
| TDB74-80F50-2.5 | TDSCA74-80 | 75 | 50 | 75 | 200 | 80 | 333 | 5.7 | AP1101 | 0.5 | WWMU11X512R-D* |
| TDB74-80F50-2.5 | TDSCA74-80 | 76 | 50 | 75 | 200 | 80 | 333 | 5.7 | AP1102 | 1 | WWMU11X512R-D* |
| TDB74-80F50-2.5 | TDSCA74-80 | 77 | 50 | 75 | 200 | 80 | 333 | 5.7 | AP1103 | 1.5 | WWMU11X512R-D* |
| TDB74-80F50-2.5 | TDSCA74-80 | 78 | 50 | 75 | 200 | 80 | 333 | 5.7 | AP1104 | 2 | WWMU11X512R-D* |
| TDB74-80F50-2.5 | TDSCA74-80 | 79 | 50 | 75 | 200 | 80 | 333 | 5.7 | AP1105 | 2.5 | WWMU11X512R-D* |
| TDB74-80F50-2.5 | TDSCA74-80 | 80 | 50 | 75 | 200 | 80 | 333 | 5.7 | AP1106 | 3 | WWMU11X512R-D* |

## Body

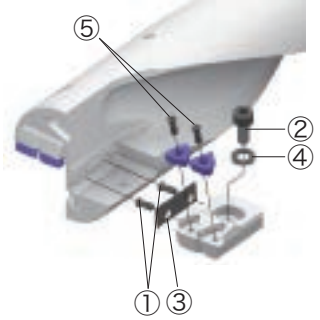
### SPARE PARTS

| Designation | ① Setting plate screw | Plug | ② Cartridge screw | ③ Setting plate | ③ Setting plate 1 | ③ Setting plate 2 | ③ Setting plate 3 | ③ Setting plate 4 | ③ Setting plate 5 | Wrench for setting plate | Wrench for cartridge | Wrench for plug | ④ Washer |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TDB55-56F50-2.5 | CSTB-3 | PT1/4GN | CM5X0.8X12 | AP0801 | - | - | - | - | - | T-9D | P-4 | P-6 | 5.3X10X1 |
| TDB57-62F50-2.5 | CSTB-3 | PT1/4GN | CM5X0.8X12 | AP0801 | AP0802 | AP0803 | AP0804 | AP0805 | - | T-9D | P-4 | P-6 | 5.3X10X1 |
| TDB63-66F50-2.5 | CSTB-3 | PT1/4GN | CHHM6-15 | AP0801 | AP0802 | AP0803 | - | - | - | T-9D | P-5 | P-6 | 6.4X12.5X1.6 |
| TDB67-73F50-2.5 | CSTB-3 | PT1/4GN | CM6X16 | AP1101 | AP1102 | AP1103 | AP1104 | AP1105 | AP1106 | T-9D | P-5 | P-6 | 6.4X12.5X1.6 |
| TDB74-80F50-2.5 | CSTB-3 | PT1/4GN | CM6X16 | AP1101 | AP1102 | AP1103 | AP1104 | AP1105 | AP1106 | T-9D | P-5 | P-6 | 6.4X12.5X1.6 |

## Cartridge set

### SPARE PARTS

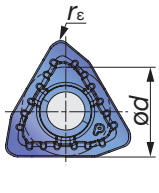
| Designation | ⑤ Insert screw | Wrench |
|---|---|---|
| TDSCA55 - 56 | CSTB-3 | T-9F |
| TDSCA57 - 62 | CSTB-3 | T-9F |
| TDSCA63 - 66 | CSTB-3 | T-9F |
| TDSCA67 - 73 | CSTB-4 | T-15F |
| TDSCA74 - 80 | CSTB-5 | T-20F |

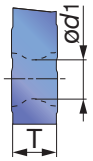


# INSERT

## DJ



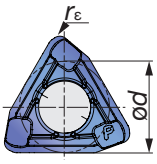


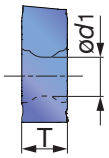




| Designation | AH9030 | ød | T | ød1 | rε | øDc |
|---|---|---|---|---|---|---|
| WWMU08X408R-DJ | ● | 8 | 3.9 | 3.4 | 0.8 | ø55 - ø66 |
| WWMU09X510R-DJ | ● | 9.7 | 4.9 | 4.4 | 1 | ø67 - ø73 |
| WWMU11X512R-DJ | ● | 11.3 | 5.7 | 5.5 | 1.2 | ø74 - ø80 |

## DS






| Designation | AH6030 | ød | T | ød1 | rε | øDc |
|---|---|---|---|---|---|---|
| WWMU08X408R-DS | ● | 8 | 3.9 | 3.4 | 0.8 | ø55 - ø66 |
| WWMU09X510R-DS | ● | 9.7 | 4.9 | 4.4 | 1 | ø67 - ø73 |
| WWMU11X512R-DS | ● | 11.3 | 5.7 | 5.5 | 1.2 | ø74 - ø80 |



● : Line-up

## STANDARD CUTTING CONDITIONS

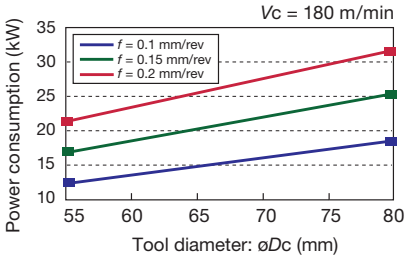
| ISO | Workpiece material | Selection criteria | Chip-breaker | Grade | Cutting speed | Feed: *f* (mm/rev) øDc (mm) | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | *Vc* (m/min) | ø55 - 56 | ø57 - 73 | ø74 - 80 |
| P | Low carbon steels (C<0.3) C15E4, E275A, E355D, etc. | First choice | DS | AH6030 | 160 - 250 | 0.04 - 0.1 | 0.04 - 0.1 | 0.04 - 0.1 |
| | | For wear resistance | DJ | AH9030 | 160 - 320 | 0.04 - 0.1 | 0.04 - 0.1 | 0.04 - 0.1 |
| | Carbon steels (C>0.3) C45, C55, etc. | First choice | DJ | AH9030 | 80 - 250 | 0.06 - 0.16 | 0.06 - 0.18 | 0.08 - 0.2 |
| | | For impact resistance | DS | AH6030 | 80 - 250 | 0.04 - 0.13 | 0.04 - 0.15 | 0.04 - 0.16 |
| | Low alloy steels 18CrMo4, etc. | First choice | DS | AH6030 | 160 - 250 | 0.04 - 0.12 | 0.04 - 0.12 | 0.04 - 0.12 |
| | | For wear resistance | DJ | AH9030 | 160 -250 | 0.06 - 0.14 | 0.06 - 0.14 | 0.06 - 0.14 |
| | Alloy steels 42CrMo4, 20Cr4, etc. | First choice | DJ | AH9030 | 80 - 200 | 0.06 - 0.16 | 0.06 - 0.18 | 0.08 - 0.2 |
| | | For impact resistance | DS | AH6030 | 80 - 200 | 0.04 - 0.13 | 0.04 - 0.14 | 0.04 - 0.15 |
| M | Stainless steels (Austenitic) X5CrNi189, X5CrNiMo17-12-2, etc. | First choice | DS | AH6030 | 100 - 200 | 0.04 - 0.12 | 0.04 - 0.12 | 0.04 - 0.12 |
| | | — | DJ | AH9030 | 100 - 200 | 0.04 - 0.12 | 0.04 - 0.12 | 0.04 - 0.12 |
| | Stainless steels (Martensitic and ferritic) X6Cr17, X12CrS13, etc. | First choice | DS | AH6030 | 100 - 200 | 0.04 - 0.12 | 0.04 - 0.12 | 0.04 - 0.12 |
| | | — | DJ | AH9030 | 100 - 200 | 0.04 - 0.12 | 0.04 - 0.12 | 0.04 - 0.12 |
| | Stainless steels (Precipitation hardening) X5CrNiCuNb16-4, etc. | First choice | DS | AH6030 | 80 - 120 | 0.04 - 0.1 | 0.04 - 0.1 | 0.04 - 0.1 |
| | | — | DJ | AH9030 | 80 - 120 | 0.04 - 0.1 | 0.04 - 0.1 | 0.04 - 0.1 |
| K | Grey cast irons 250, etc. | First choice | DJ | AH9030 | 80 - 250 | 0.06 - 0.18 | 0.08 - 0.2 | 0.08 - 0.22 |
| | | For impact resistance | DS | AH6030 | 80 - 200 | 0.06 - 0.15 | 0.08 - 0.16 | 0.08 - 0.18 |
| | Ductile cast irons 700-2, etc. | First choice | DJ | AH9030 | 80 - 200 | 0.06 - 0.16 | 0.06 - 0.18 | 0.08 - 0.2 |
| | | For impact resistance | DS | AH6030 | 80 - 150 | 0.06 - 0.15 | 0.08 - 0.16 | 0.08 - 0.18 |
| N | Aluminium alloys | First choice | DS | AH6030 | 200 - 400 | 0.1 - 0.2 | 0.1 - 0.23 | 0.1 - 0.25 |
| | | — | DJ | AH9030 | 200 - 400 | 0.1 - 0.2 | 0.1 - 0.23 | 0.1 - 0.25 |
| S | High temperature alloys Innconel718, etc. | First choice | DS | AH6030 | 20 - 60 | 0.04 - 0.08 | 0.04 - 0.1 | 0.04 - 0.1 |
| | | — | DJ | AH9030 | 20 - 60 | 0.04 - 0.08 | 0.04 - 0.1 | 0.04 - 0.1 |
| | Titanium alloys Ti-6Al-4V, etc. | First choice | DS | AH6030 | 40 - 120 | 0.06 - 0.12 | 0.06 - 0.14 | 0.06 - 0.14 |
| | | — | DJ | AH9030 | 40 - 120 | 0.06 - 0.12 | 0.06 - 0.14 | 0.06 - 0.14 |
| H | High hardened steels < 40HRC | First choice | DJ | AH9030 | 50 - 100 | 0.04 - 0.08 | 0.04 - 0.1 | 0.04 - 0.1 |
| | | For impact resistance | DS | AH6030 | 40 - 80 | 0.04 - 0.08 | 0.04 - 0.1 | 0.04 - 0.1 |



## Caution

### Machine

- Use drills on a fully covered machine to maintain safety.
- Use drills on a high powered machine such as a BT50.
- Figure on right shows reference of required machine power.



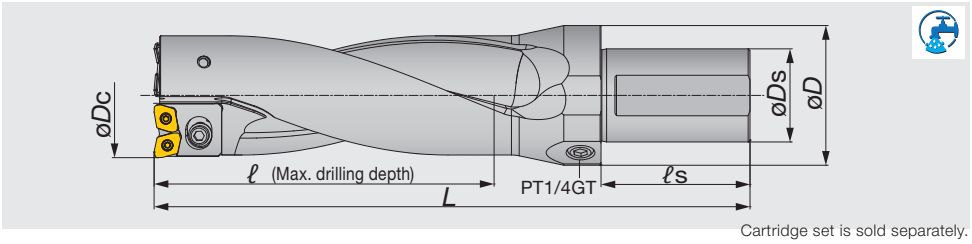

### Cutting coolant

- Use water soluble type coolant
- with internal supply.
- Coolant pressure higher than 1MPa is essential.

## TDB, TDX cartridge set

L/D = 2.5, dia. ø55 - ø80 mm, diameter adjustable with setting plate






Cartridge set is sold separately.

| Body Designation | Cartridge set Designation | øDc | øDs | øD | ℓ | ℓs | L | kg | Setting plate Designation | (mm) | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TDB55-56F50-2.5 | TDXCA55-56 | 55 | 50 | 75 | 140 | 80 | 260 | 3.2 | - | - | XPMT08T308R-D* |
| TDB55-56F50-2.5 | TDXCA55-56 | 56 | 50 | 75 | 140 | 80 | 260 | 3.2 | AP0801 | 0.5 | XPMT08T308R-D* |
| TDB57-62F50-2.5 | TDXCA57-62 | 57 | 50 | 75 | 155 | 80 | 280 | 3.6 | - | - | XPMT08T308R-D* |
| TDB57-62F50-2.5 | TDXCA57-62 | 58 | 50 | 75 | 155 | 80 | 280 | 3.6 | AP0801 | 0.5 | XPMT08T308R-D* |
| TDB57-62F50-2.5 | TDXCA57-62 | 59 | 50 | 75 | 155 | 80 | 280 | 3.6 | AP0802 | 1 | XPMT08T308R-D* |
| TDB57-62F50-2.5 | TDXCA57-62 | 60 | 50 | 75 | 155 | 80 | 280 | 3.6 | AP0803 | 1.5 | XPMT08T308R-D* |
| TDB57-62F50-2.5 | TDXCA57-62 | 61 | 50 | 75 | 155 | 80 | 280 | 3.6 | AP0804 | 2 | XPMT08T308R-D* |
| TDB57-62F50-2.5 | TDXCA57-62 | 62 | 50 | 75 | 155 | 80 | 280 | 3.6 | AP0805 | 2.5 | XPMT08T308R-D* |
| TDB63-66F50-2.5 | TDXCA63-66 | 63 | 50 | 75 | 165 | 80 | 295 | 4.2 | - | - | XPMT08T308R-D* |
| TDB63-66F50-2.5 | TDXCA63-66 | 64 | 50 | 75 | 165 | 80 | 295 | 4.2 | AP0801 | 0.5 | XPMT08T308R-D* |
| TDB63-66F50-2.5 | TDXCA63-66 | 65 | 50 | 75 | 165 | 80 | 295 | 4.2 | AP0802 | 1 | XPMT08T308R-D* |
| TDB63-66F50-2.5 | TDXCA63-66 | 66 | 50 | 75 | 165 | 80 | 295 | 4.2 | AP0803 | 1.5 | XPMT08T308R-D* |
| TDB67-73F50-2.5 | TDXCA67-73 | 67 | 50 | 75 | 183 | 80 | 320 | 5 | - | - | XPMT110412R-D* |
| TDB67-73F50-2.5 | TDXCA67-73 | 68 | 50 | 75 | 183 | 80 | 320 | 5 | AP1101 | 0.5 | XPMT110412R-D* |
| TDB67-73F50-2.5 | TDXCA67-73 | 69 | 50 | 75 | 183 | 80 | 320 | 5 | AP1102 | 1 | XPMT110412R-D* |
| TDB67-73F50-2.5 | TDXCA67-73 | 70 | 50 | 75 | 183 | 80 | 320 | 5 | AP1103 | 1.5 | XPMT110412R-D* |
| TDB67-73F50-2.5 | TDXCA67-73 | 71 | 50 | 75 | 183 | 80 | 320 | 5 | AP1104 | 2 | XPMT110412R-D* |
| TDB67-73F50-2.5 | TDXCA67-73 | 72 | 50 | 75 | 183 | 80 | 320 | 5 | AP1105 | 2.5 | XPMT110412R-D* |
| TDB67-73F50-2.5 | TDXCA67-73 | 73 | 50 | 75 | 183 | 80 | 320 | 5 | AP1106 | 3 | XPMT110412R-D* |
| TDB74-80F50-2.5 | TDXCA74-80 | 74 | 50 | 75 | 200 | 80 | 330 | 5.7 | - | - | XPMT110412R-D* |
| TDB74-80F50-2.5 | TDXCA74-80 | 75 | 50 | 75 | 200 | 80 | 330 | 5.7 | AP1101 | 0.5 | XPMT110412R-D* |
| TDB74-80F50-2.5 | TDXCA74-80 | 76 | 50 | 75 | 200 | 80 | 330 | 5.7 | AP1102 | 1 | XPMT110412R-D* |
| TDB74-80F50-2.5 | TDXCA74-80 | 77 | 50 | 75 | 200 | 80 | 330 | 5.7 | AP1103 | 1.5 | XPMT110412R-D* |
| TDB74-80F50-2.5 | TDXCA74-80 | 78 | 50 | 75 | 200 | 80 | 330 | 5.7 | AP1104 | 2 | XPMT110412R-D* |
| TDB74-80F50-2.5 | TDXCA74-80 | 79 | 50 | 75 | 200 | 80 | 330 | 5.7 | AP1105 | 2.5 | XPMT110412R-D* |
| TDB74-80F50-2.5 | TDXCA74-80 | 80 | 50 | 75 | 200 | 80 | 330 | 5.7 | AP1106 | 3 | XPMT110412R-D* |

### Body

SPARE PARTS



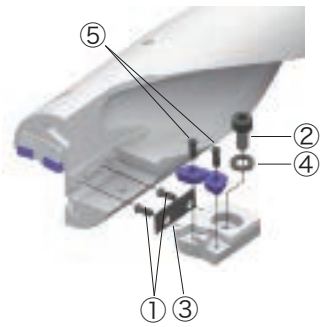
| Designation | ① Setting plate screw | Plug | ② Cartridge screw | ③ Setting plate | ③ Setting plate 1 | ③ Setting plate 2 | ③ Setting plate 3 | ③ Setting plate 4 | ③ Setting plate 5 | Wrench for setting plate | Wrench for cartridge | Wrench for plug | ④ Washer |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TDB55-56F50-2.5 | CSTB-3 | PT1/4GN | CM5X0.8X12 | AP0801 | - | - | - | - | - | T-9D | P-4 | P-6 | 5.3X10X1 |
| TDB57-62F50-2.5 | CSTB-3 | PT1/4GN | CM5X0.8X12 | AP0801 | AP0802 | AP0803 | AP0804 | AP0805 | - | T-9D | P-4 | P-6 | 5.3X10X1 |
| TDB63-66F50-2.5 | CSTB-3 | PT1/4GN | CHHM6-15 | AP0801 | AP0802 | AP0803 | - | - | - | T-9D | P-5 | P-6 | 6.4X12.5X1.6 |
| TDB67-73F50-2.5 | CSTB-3 | PT1/4GN | CM6X16 | AP1101 | AP1102 | AP1103 | AP1104 | AP1105 | AP1106 | T-9D | P-5 | P-6 | 6.4X12.5X1.6 |
| TDB74-80F50-2.5 | CSTB-3 | PT1/4GN | CM6X16 | AP1101 | AP1102 | AP1103 | AP1104 | AP1105 | AP1106 | T-9D | P-5 | P-6 | 6.4X12.5X1.6 |

### Cartridge set

SPARE PARTS



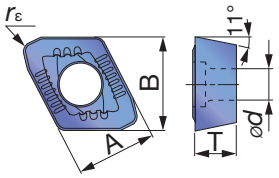
| Designation | ⑤ Insert screw | Wrench |
|---|---|---|
| TDXCA55 - 56 | CSTB-3 | T-9F |
| TDXCA57 - 62 | CSTB-3 | T-9F |
| TDXCA63 - 66 | CSTB-3 | T-9F |
| TDXCA67 - 73 | CSTB-4 | T-15F |
| TDXCA74 - 80 | CSTB-4 | T-15F |



# INSERT

## DJ

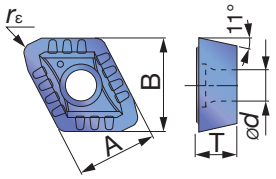





| Designation | Coating | | | | A | B | T | ød | rε | øDc |
|---|---|---|---|---|---|---|---|---|---|---|
| | AH9030 | AH6030 | AH725 | T1115 | | | | | | |
| XPMT08T308R-DJ | ● | ● | ● | ● | 8.5 | 9.9 | 3.97 | 3.4 | 0.8 | ø55 - ø66 |
| XPMT110412R-DJ | ● | ● | ● | ● | 11.2 | 12.5 | 4.76 | 4.4 | 1.2 | ø67 - ø80 |

## DS

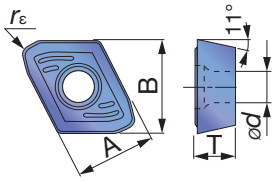





| Designation | Coating | | A | B | T | ød | rε | øDc |
|---|---|---|---|---|---|---|---|---|
| | AH6030 | AH725 | | | | | | |
| XPMT08T308R-DS | ● | ● | 8.5 | 9.9 | 3.97 | 3.4 | 0.8 | ø55 - ø66 |
| XPMT110412R-DS | ● | ● | 11.2 | 12.5 | 4.76 | 4.4 | 1.2 | ø67 - ø80 |

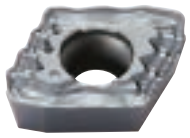
## DW

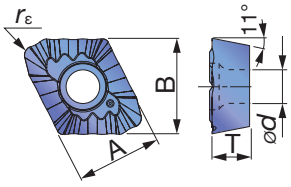





| Designation | Coating | | | A | B | T | ød | rε | øDc |
|---|---|---|---|---|---|---|---|---|---|
| | AH9030 | AH6030 | AH725 | | | | | | |
| XPMT08T308R-DW | ● | ● | ● | 8.5 | 9.9 | 3.97 | 3.4 | 0.8 | ø55 - ø66 |
| XPMT110412R-DW | ● | ● | ● | 11.2 | 12.5 | 4.76 | 4.4 | 1.2 | ø67 - ø80 |

## DG






| Designation | Coating | A | B | T | ød | rε | øDc |
|---|---|---|---|---|---|---|---|
| | AH725 | | | | | | |
| XPMT08T308R-DG | ● | 8.5 | 9.9 | 3.97 | 3.4 | 0.8 | ø55 - ø66 |
| XPMT110412R-DG | ● | 11.2 | 12.5 | 4.76 | 4.4 | 1.2 | ø67 - ø80 |



● : Line - up

## INSERTS RECOMMENDATION

| ISO | Workpiece material | First choice | High feed | High speed | Troubleshooting: Chipping resistance | Troubleshooting: Wear resistance | Troubleshooting: Surface finish | Troubleshooting: Chip control |
|---|---|---|---|---|---|---|---|---|
| P | Low carbon steel (C ≤ 0.3%) | DS, AH6030 | - | - | DS, AH725 | - | DW, AH6030 | DG, AH725 |
| P | Carbon steel (C > 0.3%) Alloy steels | DJ, AH6030 | DW, AH6030 | DJ, AH9030 | DW, AH725 | DJ, AH9030 | DW, AH6030 | - |
| P | Low alloy steel | DS, AH6030 | - | - | DS, AH725 | - | DW, AH6030 | - |
| M | Stainless steel | DS, AH6030 | - | - | DS, AH725 | - | DW, AH6030 | DG, AH725 |
| K | Grey cast iron | DJ, AH9030 | DW, AH9030 | DJ, T1115 | DW, AH725 | - | DW, AH9030 | - |
| K | Ductile cast iron | DJ, AH9030 | DW, AH9030 | - | DW, AH725 | - | DW, AH9030 | - |
| N | Aluminium alloys | DJ, AH725 | DW, AH725 | DS, AH6030 | | - | DW, AH725 | DG, AH725 |
| S | Titanium alloys Heat-resistant alloys | DS, AH6030 | - | - | DW, AH725 | - | DW, AH725 | DG, AH725 |
| H | High hardened steels | DJ, AH9030 | DW, AH9030 | - | DW, AH725 | - | DW, AH9030 | - |

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Cutting speed *Vc* (m/min) | Feed: *f* (mm/rev) ø55 ~ ø62 | ø63 ~ ø73 | ø74 ~ ø80 |
|---|---|---|---|---|---|
| P | Low carbon steels (C < 0.3) C15E4, E275A, E355D, etc. | 160 - 320 | 0.04 - 0.1 | 0.04 - 0.1 | 0.04 - 0.1 |
| P | Carbon steels (C > 0.3) C45, C55, etc. | 80 - 250 | 0.08 - 0.18 | 0.08 - 0.18 | 0.1 - 0.2 |
| P | Low alloy steels 15CrMo5, etc. | 160 - 250 | 0.04 - 0.16 | 0.04 - 0.16 | 0.04 - 0.16 |
| P | Alloy steels 42CrMo4, 20Cr4, etc. | 80 - 200 | 0.08 - 0.18 | 0.08 - 0.18 | 0.08 - 0.2 |
| M | Stainless steels (Austenitic) X5CrNi18-9, X5CrNiMo17-12-2, etc. | 100 - 200 | 0.04 - 0.12 | 0.04 - 0.12 | 0.06 - 0.14 |
| M | Stainless steels (Martensitic and ferritic) X5CrNi18-9, X5CrNiMo17-12-2, etc. | 100 - 200 | 0.04 - 0.12 | 0.04 - 0.12 | 0.06 - 0.14 |
| M | Stainless steels (Precipitation hardening) SUS630 etc. (X5CrNiCuNb16-4, etc.) | 80 - 120 | 0.04 - 0.1 | 0.04 - 0.1 | 0.06 - 0.12 |
| K | Grey cast irons 250, etc. | 80 - 250 | 0.08 - 0.2 | 0.08 - 0.2 | 0.1 - 0.22 |
| K | Ductile cast irons 600-3, etc. | 80 - 200 | 0.08 - 0.2 | 0.08 - 0.2 | 0.1 - 0.22 |
| N | Aluminium alloys AlCu4SiMg, AlSi11Cu3, etc. | 200 - 400 | 0.15 - 0.25 | 0.15 - 0.25 | 0.18 - 0.28 |

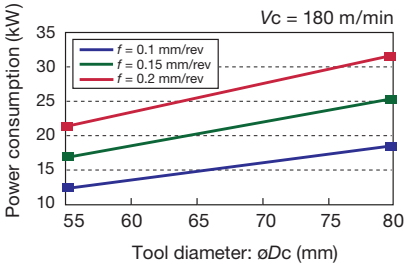
## STANDARD CUTTING CONDITIONS FOR DG CHIPBREAKER

| ISO | Workpiece material | Cutting speed *Vc* (m/min) | Series L/D | Feed: *f* (mm/rev) ø27 ~ ø32 | ø33 ~ ø54 |
|---|---|---|---|---|---|
| P | Low carbon steels (C < 0.3) C15E4, E275A, E355D, etc. | 60 - 180 | 2D, 3D | 0.04 - 0.1 | |
| | | | 4D, 5D | | |

## Caution

### Machine

- Use drills on a fully covered machine to maintain safety.
- Use drills on a high powered machine such as a BT50.
- Figure on right shows reference of required machine power.



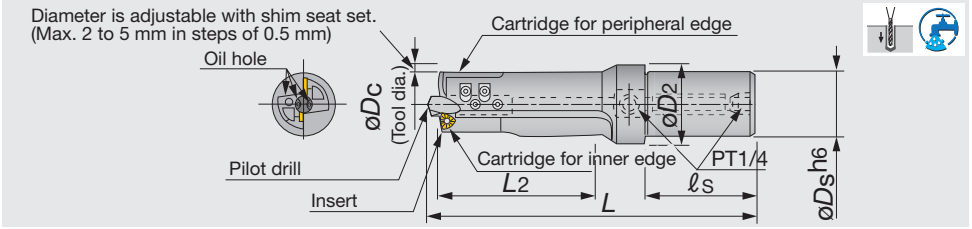

### Cutting coolant

- Use water soluble type coolant with internal supply.
- Coolant pressure higher than 1MPa is essential.

## TDP L/D=5

Indexable drills with pilot drill for deep hole drilling






| Designation | øDc | øDs | øD2 | L | L2 | ℓs | Insert | Pilot drill (included in the package) |
|---|---|---|---|---|---|---|---|---|
| TDP30-32 | 30 ~ 32 | 32 | 40 | 248 | 150 | 60 | WPMT040208-D3 | DP08 (ø8) |
| TDP37-40 | 37 ~ 40 | 40 | 50 | 295 | 185 | 70 | WPMT050308-D3 | DP10 (ø10) |
| TDP40-45 | 40 ~ 45 | 40 | 50 | 310 | 200 | 70 | WPMT050308-D3 | DP12 (ø12) |
| TDP45-50 | 45 ~ 50 | 40 | 50 | 347 | 225 | 70 | WPMT06T308-D3 | DP12 (ø12) |
| TDP60-65 | 60 ~ 65 | 50 | 58.5 | 470 | 300 | 120 | WPMT080412-D3 | DP12 (ø12) |

Note: Diameter is adjustable with shim seat set

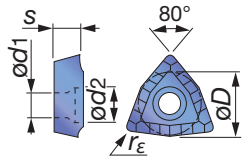
Note: L/D = Hole depth / Drill diameter

### SPARE PARTS

| Designation | Cartridge | | Clamping screw | | | Oil hole plug screw | Wrenches | | | Oil hole plug screw | Shim seat set |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | For peripheral edge | For inner edge | For inserts | For Cartridge | For pilot drill | | For inserts | For Cartridge | For pilot drill | | |
| TDP30-32 | CW04A | CW04B | CSTB-2.5S | BHM4-8 | SSHM5-10 | PT1/4GN | T-8D | P-2.5 | Same for cartridge | P-6 | SW04 |
| TDP37-40 | CW05A | CW05B | CSTB-3S | BHM4-10 | SSHM5-10 | PT1/4GN | T-9D | P-2.5 | Same for cartridge | P-6 | SW05 |
| TDP40-45 | CW05A | CW05B | CSTB-3S | BHM4-10 | SSHM6-12 | PT1/4GN | T-9D | P-2.5 | P-3 | P-6 | SW05 |
| TDP45-50 | CW06A | CW06B | CSTB-3.5D | BHM5-14 | SSHM6-12 | PT1/4GN | T-9D | P-3 | Same for cartridge | P-6 | SW06 |
| TDP60-65 | CW08A | CW08B | CSTB-4M | CHHM5-18 (CM5×0.8×18) | SSHM6-20 | PT1/4GN | T-15D | P-4 | P-3 | P-6 | SW08 |

## INSERT

### WPMT04/05/06/08-D3

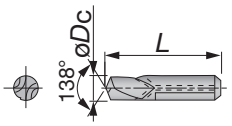



| Designation | T313W | øD | s | rε | ød1 | ød2 |
|---|---|---|---|---|---|---|
| WPMT040208-D3 | ● | 6.35 | 2.38 | 0.8 | 2.86 | 3.75 |
| WPMT050308-D3 | ● | 7.938 | 3.18 | 0.8 | 3.4 | 4.5 |
| WPMT06T308-D3 | ● | 9.525 | 3.97 | 0.8 | 3.9 | 5.1 |
| WPMT080412-D3 | ● | 12.7 | 4.76 | 1.2 | 4.4 | 6 |

Note: the appearance of WPMT040208-D3 type insert differs from the drawing above.

## PILOT DRILL

### DP08/10/12




| Designation | HSS | øDc | L |
|---|---|---|---|
| DP08 | ● | 8 | 42 |
| DP10 | ● | 10 | 48 |
| DP12 | ● | 12 | 55 |

Note : DP08 type drill does not have oil hole.

Package quantity: 1pc

● : Line - up

Indexable Drill

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Cutting speed *Vc* (m/min) | Feed *f* (mm/rev) |
|---|---|---|---|
| P | Carbon steel | 60 - 70 | 0.07 - 0.17 |
| | Alloy steel | 60 - 70 | 0.07 - 0.17 |
| K | Cast iron | 70 - 100 | 0.1 - 0.2 |

Note: ø*Dc* ≦ ø37 mm, feed should be set less than 0.13 mm/rev for steel, 0.15 mm/rev for cast iron.

Number of revolutions *n* (min-1) = Cutting speed *Vc* ×1000×3.14÷Tool diameter ø*Dc*
Feed speed *Vf* (mm/min) = No. of revolutions *n* (min-1) ×Feed per revolution *f* (mm/rev)

## Cautionary points in use

- When drilling steel, a water soluble coolant should be used. Coolant pressure of 1 MPa or higher and quantity of 10 litter/min or more are essential.
- For tool-rotating applications with TDP60-65 65-70, please check the availability of holders. Since its shank dia is 50mm.
- Drilling into stacked plates is not recommended.
- Not suitable for low carbon steels and stainless steels, because of chip control issues.

# Drilling Inserts

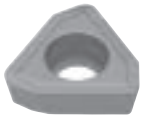
● LPMT03X206R-D4, LPMT05X204-D4

| Shape | Designation | Coating | | | | | Applicable drill diameter | Applicable drill |
|---|---|---|---|---|---|---|---|---|
| | | T313W | | | | | | |
|  | LPMT03X206R-D4 | ● | | | | | ø14.0 ~ ø17.5 | TDJ (Former products) |
| | LPMT05X204-D4 | ● | | | | | ø14.0 ~ ø17.5 | |
| | | | | | | | | |

● SPMP831DS, SPMP/M**2ERD

| Shape | Designation | ISO Metric Designation | Coating | | | | | Applicable drill diameter | Applicable drill |
|---|---|---|---|---|---|---|---|---|---|
| | | | T313W | | | | | | |
|  | SPMP831DS | SPMT060204-DS | ● | | | | | ø18.0 ~ ø19.5 | TDR (Former products) |
| | SPMP042ERD | SPMP080308ER-D | ● | | | | | ø20.0 ~ ø28.5 | |
| | SPMM322ERD | SPMT090308ER-D | ● | | | | | ø29.0 ~ ø34.5 | |
| | SPMM432ERD | SPMT120408ER-D | ● | | | | | ø35.0 ~ ø49.0 | |
| | | | | | | | | | |

● TPMP**ZDS, TPMP**ZERD, TPMM**ZERD

| Shape | Designation | Coating | | | | | Applicable drill diameter | Applicable drill |
|---|---|---|---|---|---|---|---|---|
| | | T313W | | | | | | |
|  | TPMP83ZDS | ● | | | | | ø18.0 ~ ø19.5 | TDR (Former products) |
| | TPMP04ZERD | ● | | | | | ø18.0 ~ ø19.5 | |
| | TPMM32ZERD | ● | | | | | ø29.0 ~ ø34.5 | |
| | TPMM43ZERD | ● | | | | | ø35.0 ~ ø54.0 | |

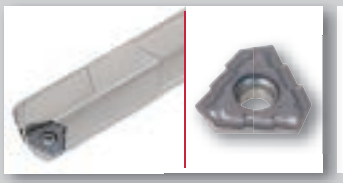
● WCMT**-D...

| Shape | Designation | Coating | | | | | | | | | Applicable drill |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH140 | T313W | | | | | | | |
|  | WCMT050308-DC | | | ● | | | | | | | For boring and Drills (Former products) |
| | WCMT050308-D4 | ● | ● | ● | | | | | | | |
| | WCMT06T308-DC | | | ● | | | | | | | |
| | WCMT06T308-D4 | ● | ● | ● | | | | | | | |
| | WCMT080412-DC | | | ● | | | | | | | |
| | WCMT080412-D4 | | | ● | | | | | | | |

● : Line - up

MEMO

# DrillLine - Deep Hole Drill



## DEEP TRI DRILL

E104

Excellent productivity and stability in deep hole drilling

**ø16 mm - ø28 mm / L/D = 10, 15, 25: for Machining centers**
**OAL < 1500 mm: for Gundrill machines (Standard line-ups)**



## GUNDRILL

E114

Brazed gundrills suitable for small and deep hole drilling

**Tool dia.: ø3 mm - ø12.2 mm**
**OAL ≤ 1650 mm (Standard line-ups)**



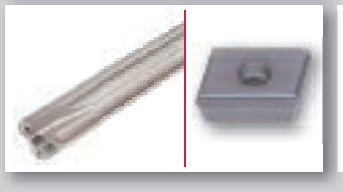
## BTA tools for deep hole drilling

E117

Single and Double tube type. New solution for deep hole drilling

**ø8 mm - ø249 mm**

TAILOREDTOOL



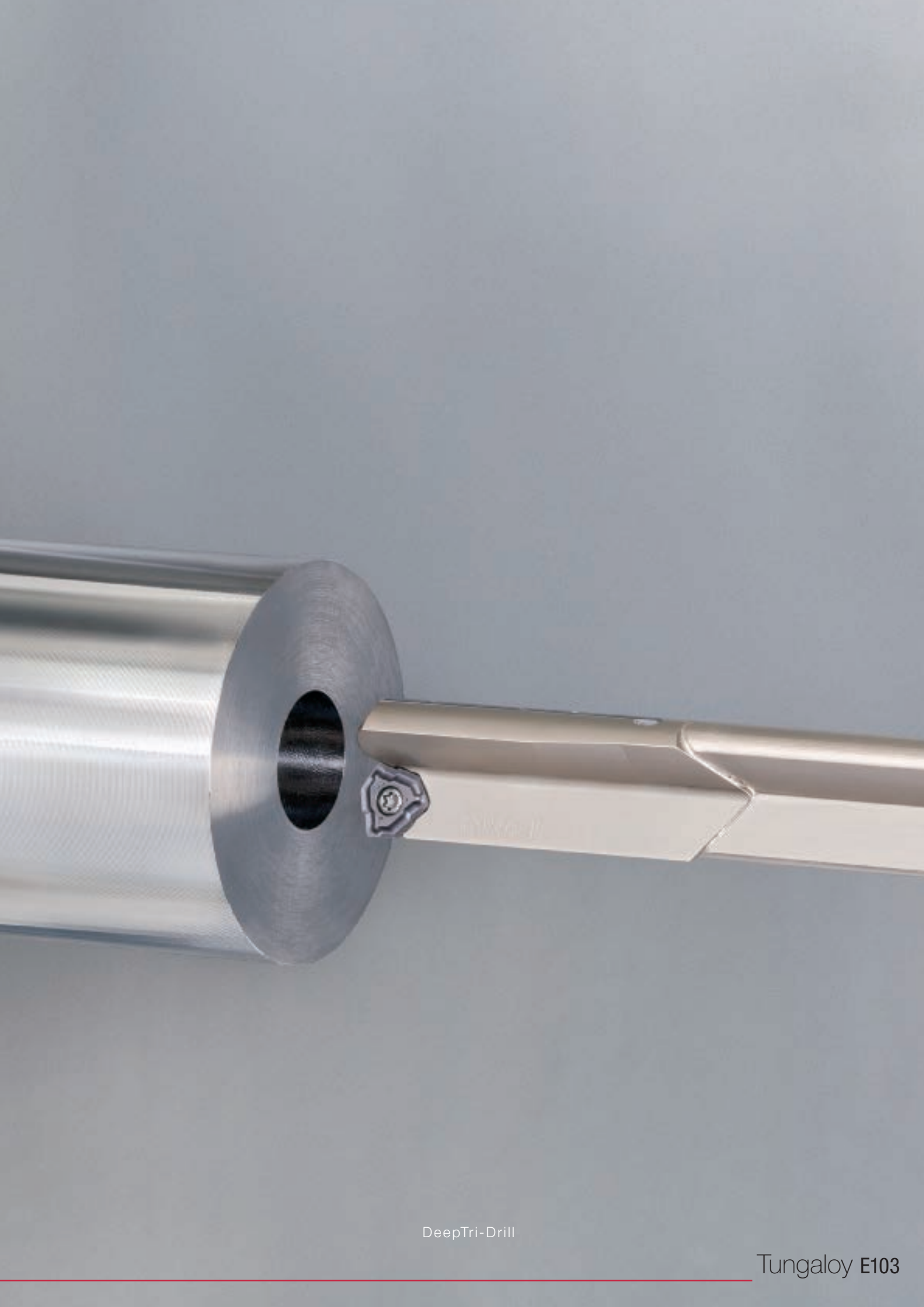
## HF drills for deep hole drilling

E119

Indexable deep hole drills for large diameter with high productivity drilling

**ø30 mm - ø69 mm / Drilling depth: L/D ≤ 14**

TAILOREDTOOL

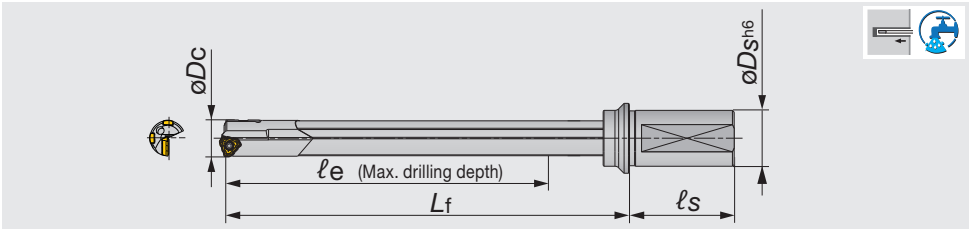


DeepTri-Drill

# MCTR L/D=10

Drill body for lathes and machining centers, L/D = 10, Tool dia. ø16 - ø28 mm






| Designation | øDc | øDs | ℓe | ℓs | Lf | Insert | Guide pad |
|---|---|---|---|---|---|---|---|
| MCTR16.00XM25-10 | 16 | 25 | 170 | 56 | 209 | TOHT08... | GP06-075 |
| MCTR16.50XM25-10 | 16.5 | 25 | 170 | 56 | 209 | TOHT08... | GP06-075 |
| MCTR17.00XM25-10 | 17 | 25 | 180 | 56 | 220 | TOHT08... | GP06-075 |
| MCTR18.00XM25-10 | 18 | 25 | 190 | 56 | 232 | TOHT08... | GP06-075 |
| MCTR19.00XM25-10 | 19 | 25 | 200 | 56 | 243 | TOHT09... | GP06-085 |
| MCTR20.00XM32-10 | 20 | 32 | 210 | 60 | 255 | TOHT09... | GP06-085 |
| MCTR21.00XM32-10 | 21 | 32 | 220 | 60 | 266 | TOHT10... | GP06-085 |
| MCTR22.00XM32-10 | 22 | 32 | 230 | 60 | 278 | TOHT11... | GP06-100 |
| MCTR23.00XM32-10 | 23 | 32 | 240 | 60 | 289 | TOHT11... | GP06-100 |
| MCTR24.00XM32-10 | 24 | 32 | 250 | 60 | 301 | TOHT11... | GP06-100 |
| MCTR25.00XM32-10 | 25 | 32 | 260 | 60 | 312 | TOHT11... | GP06-100 |
| MCTR26.00XM40-10 | 26 | 40 | 270 | 70 | 324 | TOHT12... | GP06 |
| MCTR27.00XM40-10 | 27 | 40 | 280 | 70 | 335 | TOHT12... | GP06 |
| MCTR28.00XM40-10 | 28 | 40 | 280 | 70 | 337 | TOHT12... | GP06 |

| øDc | Tool diameter tolerance | Hole diameter tolerance* |
|---|---|---|
| ø16 - ø28 | 0 / - 0.07 | + 0.05 / - 0.1 |

*Just for reference

## SPARE PARTS



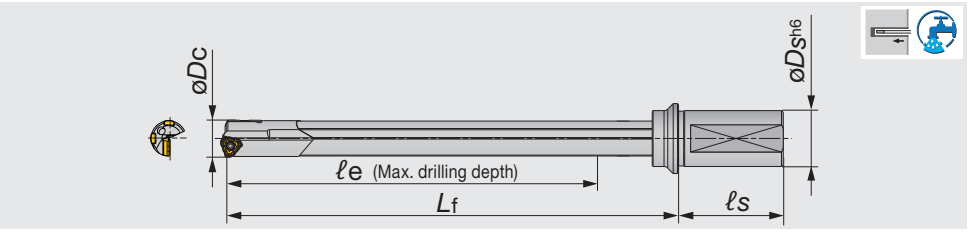



| Designation | Insert | | Guide pad | |
|---|---|---|---|---|
| | Screw | Wrench | Screw | Wrench |
| MCTR16... - MCTR18... | CSTB2.5S | T-8F | SR34-508 | T-7F |
| MCTR19... - MCTR20... | SR14-560/S | T-8F | SR34-508 | T-7F |
| MCTR21... | SR34-506 | T-9F | SR34-508 | T-7F |
| MCTR22... - MCTR25... | SR14-571/S | T-10/5 | SR34-508 | T-7F |
| MCTR26... - MCTR28... | SR14-506 | T-15F | SR34-508 | T-7F |

## MCTR L/D=15

Drill body for lathes and machining centers, L/D = 15, Tool dia. ø16 - ø28 mm






| Designation | øDc | øDs | ℓe | ℓs | Lf | Insert | Guide pad |
|---|---|---|---|---|---|---|---|
| MCTR16.00XM25-15 | 16 | 25 | 255 | 56 | 294 | TOHT08... | GP06-075 |
| MCTR16.50XM25-15 | 16.5 | 25 | 255 | 56 | 294 | TOHT08... | GP06-075 |
| MCTR17.00XM25-15 | 17 | 25 | 270 | 56 | 310 | TOHT08... | GP06-075 |
| MCTR17.50XM25-15 | 17.5 | 25 | 270 | 56 | 310 | TOHT08... | GP06-075 |
| MCTR18.00XM25-15 | 18 | 25 | 285 | 56 | 327 | TOHT08... | GP06-075 |
| MCTR18.50XM25-15 | 18.5 | 25 | 285 | 56 | 327 | TOHT09... | GP06-085 |
| MCTR19.00XM25-15 | 19 | 25 | 300 | 56 | 343 | TOHT09... | GP06-085 |
| MCTR19.50XM25-15 | 19.5 | 25 | 300 | 56 | 343 | TOHT09... | GP06-085 |
| MCTR20.00XM32-15 | 20 | 32 | 315 | 60 | 360 | TOHT09... | GP06-085 |
| MCTR21.00XM32-15 | 21 | 32 | 330 | 60 | 376 | TOHT10... | GP06-085 |
| MCTR22.00XM32-15 | 22 | 32 | 345 | 60 | 393 | TOHT11... | GP06-100 |
| MCTR23.00XM32-15 | 23 | 32 | 360 | 60 | 409 | TOHT11... | GP06-100 |
| MCTR24.00XM32-15 | 24 | 32 | 375 | 60 | 426 | TOHT11... | GP06-100 |
| MCTR25.00XM32-15 | 25 | 32 | 390 | 60 | 442 | TOHT11... | GP06-100 |
| MCTR26.00XM40-15 | 26 | 40 | 405 | 70 | 459 | TOHT12... | GP06 |
| MCTR27.00XM40-15 | 27 | 40 | 420 | 70 | 475 | TOHT12... | GP06 |
| MCTR28.00XM40-15 | 28 | 40 | 420 | 70 | 477 | TOHT12... | GP06 |

| øDc | Tool diameter tolerance | Hole diameter tolerance* |
|---|---|---|
| ø16 - ø28 | 0 / - 0.07 | + 0.05 / - 0.1 |

*Just for reference

### SPARE PARTS



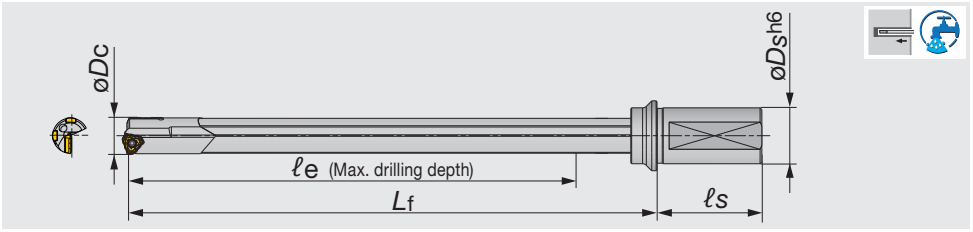



| Designation | Insert | | Guide pad | |
|---|---|---|---|---|
| | Screw | Wrench | Screw | Wrench |
| MCTR16... - MCTR18.0... | CSTB2.5S | T-8F | SR34-508 | T-7F |
| MCTR18.5... - MCTR20... | SR14-560/S | T-8F | SR34-508 | T-7F |
| MCTR21... | SR34-506 | T-9F | SR34-508 | T-7F |
| MCTR22... - MCTR25... | SR14-571/S | T-10/5 | SR34-508 | T-7F |
| MCTR26... - MCTR28... | SR14-506 | T-15F | SR34-508 | T-7F |

# MCTR L/D=25

Drill body for lathes and machining centers, L/D = 25, Tool dia. ø16 - ø28 mm






| Designation | øDc | øDs | ℓe | ℓs | Lf | Insert | Guide pad |
|---|---|---|---|---|---|---|---|
| MCTR16.00XM25-25 | 16 | 25 | 425 | 56 | 464 | TOHT08... | GP06-075 |
| MCTR16.50XM25-25 | 16.5 | 25 | 425 | 56 | 464 | TOHT08... | GP06-075 |
| MCTR17.00XM25-25 | 17 | 25 | 450 | 56 | 490 | TOHT08... | GP06-075 |
| MCTR17.50XM25-25 | 17.5 | 25 | 450 | 56 | 490 | TOHT08... | GP06-075 |
| MCTR18.00XM25-25 | 18 | 25 | 475 | 56 | 517 | TOHT08... | GP06-075 |
| MCTR18.50XM25-25 | 18.5 | 25 | 475 | 56 | 517 | TOHT09... | GP06-085 |
| MCTR19.00XM25-25 | 19 | 25 | 500 | 56 | 543 | TOHT09... | GP06-085 |
| MCTR19.50XM25-25 | 19.5 | 25 | 500 | 56 | 543 | TOHT09... | GP06-085 |
| MCTR20.00XM32-25 | 20 | 32 | 525 | 60 | 570 | TOHT09... | GP06-085 |
| MCTR21.00XM32-25 | 21 | 32 | 550 | 60 | 596 | TOHT10... | GP06-085 |
| MCTR22.00XM32-25 | 22 | 32 | 575 | 60 | 623 | TOHT11... | GP06-100 |
| MCTR23.00XM32-25 | 23 | 32 | 600 | 60 | 649 | TOHT11... | GP06-100 |
| MCTR24.00XM32-25 | 24 | 32 | 625 | 60 | 676 | TOHT11... | GP06-100 |
| MCTR25.00XM32-25 | 25 | 32 | 650 | 60 | 702 | TOHT11... | GP06-100 |
| MCTR26.00XM40-25 | 26 | 40 | 675 | 70 | 729 | TOHT12... | GP06 |
| MCTR27.00XM40-25 | 27 | 40 | 700 | 70 | 755 | TOHT12... | GP06 |
| MCTR28.00XM40-25 | 28 | 40 | 700 | 70 | 757 | TOHT12... | GP06 |

| øDc | Tool diameter tolerance | Hole diameter tolerance* |
|---|---|---|
| ø16 - ø28 | 0 / - 0.07 | + 0.05 / - 0.1 |

*Just for reference

## SPARE PARTS






| Designation | Insert | | Guide pad | |
|---|---|---|---|---|
| | Screw | Wrench | Screw | Wrench |
| MCTR16... - MCTR18.0... | CSTB2.5S | T-8F | SR34-508 | T-7F |
| MCTR18.5... - MCTR20... | SR14-560/S | T-8F | SR34-508 | T-7F |
| MCTR21... | SR34-506 | T-9F | SR34-508 | T-7F |
| MCTR22... - MCTR25... | SR14-571/S | T-10/5 | SR34-508 | T-7F |
| MCTR26... - MCTR28... | SR14-506 | T-15F | SR34-508 | T-7F |

## DESIGNATION FOR TAILOR MADE TOOLS

When a specially designed tool is needed, use the below guide line to make the designation (Cat. No).

| MCTR | 16.50 | XM | 25 | - | 22 |
|---|---|---|---|---|---|
| ① | ② | | ③ | | ④ |

| ① Series | |
|---|---|
| MCTR | DeepTriDrill (For machining centers and lathes) |

| ② Drill dia. *øDc* (mm) | |
|---|---|
| 16.50 | ø16.50 |

| ③ Driver dia. *øDs* (mm) | |
|---|---|
| 25 | ø25 |

| ④ L/D ratio |
|---|

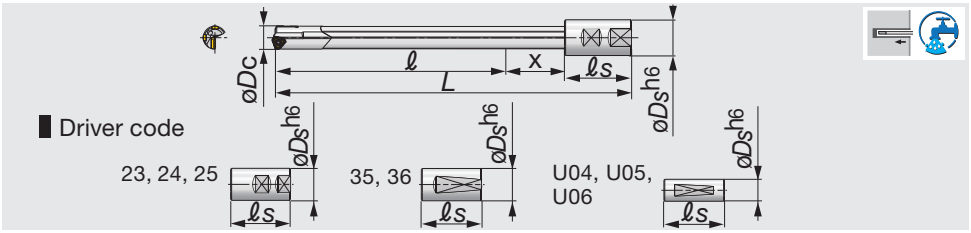
## AVAILABLE RANGE OF TAILOR MADE DRILL BODIES

| *øDc* | *øDs* | *ℓe* | *ℓs* | *ℓ1* |
|---|---|---|---|---|
| 16 - 16.79 | 25 | 136 - 425 | 56 | 175 - 464 |
| 16.8 - 17.69 | 25 | 144 - 450 | 56 | 184 - 490 |
| 17.7 - 18.69 | 25 | 152 - 475 | 56 | 194 - 517 |
| 18.7 - 19.69 | 25 | 160 - 500 | 56 | 203 - 543 |
| 19.7 - 20.69 | 32 | 168 - 525 | 60 | 213 - 570 |
| 20.7 - 21.69 | 32 | 176 - 550 | 60 | 222 - 596 |
| 21.7 - 22.69 | 32 | 184 - 575 | 60 | 232 - 623 |
| 22.7 - 23.69 | 32 | 192 - 600 | 60 | 241 - 649 |
| 23.7 - 24.69 | 32 | 200 - 625 | 60 | 251 - 676 |
| 24.7 - 25.69 | 32 | 208 - 650 | 60 | 260 - 702 |
| 25.7 - 26.69 | 40 | 216 - 675 | 70 | 270 - 719 |
| 26.7 - 27.69 | 40 | 224 - 700 | 70 | 279 - 745 |
| 27.7 - 28 | 40 | 224 - 700 | 70 | 281 - 747 |

# TRLG

## Drill body for gun drill machine, Tool dia. ø16 - ø28 mm






| Designation | øDc | L | øDs | ℓ | ℓs | x | Driver code | Insert | Guide pad |
|---|---|---|---|---|---|---|---|---|---|
| TRLG16.00X800-23 | 16 | 800 | 25 | 720 | 56 | 24 | 23 | TOHT08... | GP06-075 |
| TRLG16.00X800-U04 | 16 | 800 | 25.4 | 706 | 70 | 24 | U04 | TOHT08... | GP06-075 |
| TRLG16.00X1000-23 | 16 | 1000 | 25 | 920 | 56 | 24 | 23 | TOHT08... | GP06-075 |
| TRLG16.00X1000-U04 | 16 | 1000 | 25.4 | 906 | 70 | 24 | U04 | TOHT08... | GP06-075 |
| TRLG16.00X1500-U04 | 16 | 1500 | 25.4 | 1406 | 70 | 24 | U04 | TOHT08... | GP06-075 |
| TRLG16.00X1500-23 | 16 | 1500 | 25 | 1420 | 56 | 24 | 23 | TOHT08... | GP06-075 |
| TRLG17.00X800-23 | 17 | 800 | 25 | 719 | 56 | 25 | 23 | TOHT08... | GP06-075 |
| TRLG17.00X800-U04 | 17 | 800 | 25.4 | 705 | 70 | 25 | U04 | TOHT08... | GP06-075 |
| TRLG17.00X1000-23 | 17 | 1000 | 25 | 919 | 56 | 25 | 23 | TOHT08... | GP06-075 |
| TRLG17.00X1000-U04 | 17 | 1000 | 25.4 | 905 | 70 | 25 | U04 | TOHT08... | GP06-075 |
| TRLG18.00X800-23 | 18 | 800 | 25 | 717 | 56 | 27 | 23 | TOHT08... | GP06-075 |
| TRLG18.00X800-U04 | 18 | 800 | 25.4 | 703 | 70 | 27 | U04 | TOHT08... | GP06-075 |
| TRLG18.00X1000-23 | 18 | 1000 | 25 | 917 | 56 | 27 | 23 | TOHT08... | GP06-075 |
| TRLG18.00X1000-U04 | 18 | 1000 | 25.4 | 903 | 70 | 27 | U04 | TOHT08... | GP06-075 |
| TRLG18.00X1500-U04 | 18 | 1500 | 25.4 | 1403 | 70 | 27 | U04 | TOHT08... | GP06-075 |
| TRLG18.00X1500-23 | 18 | 1500 | 25 | 1417 | 56 | 27 | 23 | TOHT08... | GP06-075 |
| TRLG18.50X1500-U04 | 18.5 | 1500 | 25.4 | 1417 | 70 | 27 | U04 | TOHT09... | GP06-085 |
| TRLG18.50X1500-23 | 18.5 | 1500 | 25 | 1417 | 56 | 27 | 23 | TOHT09... | GP06-085 |
| TRLG19.00X800-23 | 19 | 800 | 25 | 716 | 56 | 28 | 23 | TOHT09... | GP06-085 |
| TRLG19.00X800-U04 | 19 | 800 | 25.4 | 702 | 70 | 28 | U04 | TOHT09... | GP06-085 |
| TRLG19.00X1000-23 | 19 | 1000 | 25 | 916 | 56 | 28 | 23 | TOHT09... | GP06-085 |
| TRLG19.00X1000-U04 | 19 | 1000 | 25.4 | 902 | 70 | 28 | U04 | TOHT09... | GP06-085 |
| TRLG20.00X800-24 | 20 | 800 | 32 | 710 | 60 | 30 | 24 | TOHT09... | GP06-085 |
| TRLG20.00X800-U05 | 20 | 800 | 31.75 | 700 | 70 | 30 | U05 | TOHT09... | GP06-085 |
| TRLG20.00X1000-24 | 20 | 1000 | 32 | 910 | 60 | 30 | 24 | TOHT09... | GP06-085 |
| TRLG20.00X1000-U05 | 20 | 1000 | 31.75 | 900 | 70 | 30 | U05 | TOHT09... | GP06-085 |
| TRLG21.00X1000-24 | 21 | 1000 | 32 | 909 | 60 | 31 | 24 | TOHT10... | GP06-085 |
| TRLG21.00X1000-U05 | 21 | 1000 | 31.75 | 899 | 70 | 31 | U05 | TOHT10... | GP06-085 |
| TRLG22.00X1000-24 | 22 | 1000 | 32 | 907 | 60 | 33 | 24 | TOHT11... | GP06-100 |
| TRLG22.00X1000-U05 | 22 | 1000 | 31.75 | 897 | 70 | 33 | U05 | TOHT11... | GP06-100 |
| TRLG22.00X1500-24 | 22 | 1500 | 32 | 1407 | 60 | 33 | 24 | TOHT11... | GP06-100 |
| TRLG22.00X1500-U05 | 22 | 1500 | 31.75 | 1397 | 70 | 33 | U05 | TOHT11... | GP06-100 |
| TRLG23.00X1000-24 | 23 | 1000 | 32 | 906 | 60 | 34 | 24 | TOHT11... | GP06-100 |
| TRLG23.00X1000-U05 | 23 | 1000 | 31.75 | 896 | 70 | 34 | U05 | TOHT11... | GP06-100 |
| TRLG23.00X1500-24 | 23 | 1500 | 32 | 1406 | 60 | 34 | 24 | TOHT11... | GP06-100 |
| TRLG23.00X1500-U05 | 23 | 1500 | 31.75 | 1396 | 70 | 34 | U05 | TOHT11... | GP06-100 |
| TRLG24.00X1000-24 | 24 | 1000 | 32 | 904 | 60 | 36 | 24 | TOHT11... | GP06-100 |
| TRLG24.00X1000-U05 | 24 | 1000 | 31.75 | 894 | 70 | 36 | U05 | TOHT11... | GP06-100 |
| TRLG24.00X1500-24 | 24 | 1500 | 32 | 1404 | 60 | 36 | 24 | TOHT11... | GP06-100 |
| TRLG24.00X1500-U05 | 24 | 1500 | 31.75 | 1394 | 70 | 36 | U05 | TOHT11... | GP06-100 |
| TRLG25.00X1000-24 | 25 | 1000 | 32 | 903 | 60 | 37 | 24 | TOHT11... | GP06-100 |
| TRLG25.00X1000-U05 | 25 | 1000 | 31.75 | 893 | 70 | 37 | U05 | TOHT11... | GP06-100 |
| TRLG26.00X1000-25 | 26 | 1000 | 40 | 891 | 70 | 39 | 25 | TOHT12... | GP06 |
| TRLG26.00X1000-U06 | 26 | 1000 | 38.1 | 891 | 70 | 39 | U06 | TOHT12... | GP06 |
| TRLG27.00X1000-25 | 27 | 1000 | 40 | 890 | 70 | 40 | 25 | TOHT12... | GP06 |
| TRLG27.00X1000-U06 | 27 | 1000 | 38.1 | 890 | 70 | 40 | U06 | TOHT12... | GP06 |
| TRLG28.00X1000-25 | 28 | 1000 | 40 | 888 | 70 | 42 | 25 | TOHT12... | GP06 |
| TRLG28.00X1000-U06 | 28 | 1000 | 38.1 | 888 | 70 | 42 | U06 | TOHT12... | GP06 |

| øDc | Tool diameter tolerance | Hole diameter tolerance* |
|---|---|---|
| ø16 - ø28 | 0 / - 0.07 | + 0.05 / - 0.1 |

*Just for reference

## SPARE PARTS

| Designation | Insert | | Guide pad | |
|---|---|---|---|---|
| | Screw | Wrench | Screw | Wrench |
| TRLG16... - TRLG18... | CSTB2.5S | T-8F | SR34-508 | T-7F |
| TRLG18.5... - TRLG20... | SR14-560/S | T-8F | SR34-508 | T-7F |
| TRLG21... | SR34-506 | T-9F | SR34-508 | T-7F |
| TRLG22... - TRLG25... | SR14-571/S | T-10/5 | SR34-508 | T-7F |
| TRLG26... - TRLG28... | SR14-506 | T-15F | SR34-508 | T-7F |

## DESIGNATION FOR TAILOR MADE TOOLS

When a specially designed tool is needed, use the below guide line to make the designation (Cat. No).

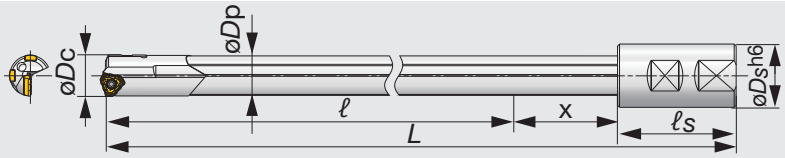
**TRLG** ① **16.50** ② **X** **900** ③ **-** **23** ④

| ① Series | |
|---|---|
| TRLG | DeepTriDrill (For gun drill machine) |

| ② Drill dia. *øDc* (mm) | |
|---|---|
| 16.50 | ø16.50 |

| ③ Overall length: *L* (mm) | |
|---|---|
| 900 | 900 |

| ④ Driver code | |
|---|---|
| 23 | 23 |




## AVAILABLE RANGE OF TAILOR MADE DRILL BODIES

| *øDc* | *L* | x |
|---|---|---|
| 16 - 16.79 | 400 - 2400 | 24 |
| 16.8 - 17.69 | 400 - 2400 | 25 |
| 17.7 - 18.69 | 400 - 2400 | 27 |
| 18.7 - 19.69 | 400 - 2400 | 28 |
| 19.7 - 20.69 | 400 - 2400 | 30 |
| 20.7 - 21.69 | 400 - 2400 | 31 |
| 21.7 - 22.69 | 400 - 2400 | 33 |

| *øDc* | *L* | x |
|---|---|---|
| 22.7 - 23.69 | 400 - 2400 | 34 |
| 23.7 - 24.69 | 400 - 2400 | 36 |
| 24.7 - 25.69 | 400 - 2400 | 37 |
| 25.7 - 26.69 | 400 - 2400 | 39 |
| 26.7 - 27.69 | 400 - 2400 | 40 |
| 27.7 - 28 | 400 - 2400 | 42 |

Please provide the driver shape depending on your request

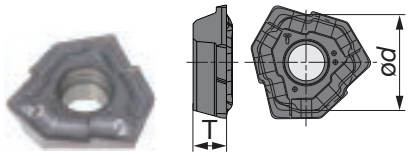
## TUBE DIAMETER

| *øDc* | *øDp* |
|---|---|
| 16 - 16.79 | 15.5 |
| 16.8 - 17.69 | 16.2 |
| 17.7 - 18.69 | 17.2 |
| 18.7 - 19.69 | 18.2 |
| 19.7 - 20.69 | 19 |
| 20.7 - 21.69 | 20 |
| 21.70 - 22.69 | 21 |

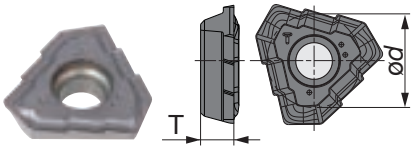
| *øDc* | *øDp* |
|---|---|
| 22.7 - 23.69 | 22 |
| 23.7 - 24.69 | 23 |
| 24.7 - 25.69 | 24 |
| 25.7 - 26.69 | 25 |
| 26.7 - 27.69 | 26 |
| 27.7 - 28 | 27 |

## INSERT

### TOHT-NDJ (080...)




### TOHT-NDJ (090... - 120...)




**NDJ chipbreaker**



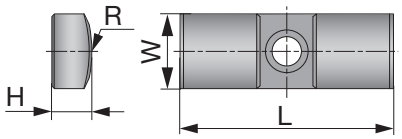
- Low cutting force
- For general purpose

| Designation | øDc | AH725 | ød | T |
|---|---|---|---|---|
| TOHT080305R-NDJ | 16 - 18 | ● | 8.55 | 2.8 |
| TOHT090305R-NDJ | 18.01 - 20 | ● | 8.32 | 3 |
| TOHT100305R-NDJ | 20.01 - 21.99 | ● | 9.23 | 3.3 |
| TOHT110405R-NDJ | 22 - 25 | ● | 10.4 | 3.8 |
| TOHT120405R-NDJ | 25.01 - 28 | ● | 11.59 | 4.3 |

● : Line - up
Package quantity = 10 pcs.

## GUIDE PAD

### GP06




| Designation | øDc | F1122 | F2122 | W | L | H | R |
|---|---|---|---|---|---|---|---|
| GP06-075 | 16 - 18 | ● | ● | 6 | 20 | 3 | 7.5 |
| GP06-085 | 18.01 - 21 | ● | ● | 6 | 20 | 3 | 8.5 |
| GP06-100 | 21.01 - 25 | ● | ● | 6 | 20 | 3 | 10 |
| GP06 | 25.01 - 28 | ● | ● | 6 | 20 | 3 | 12 |

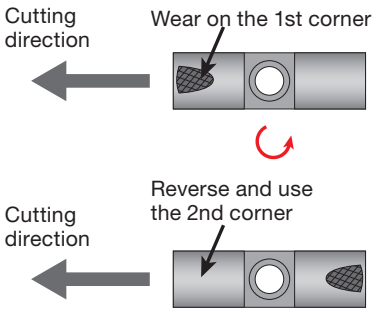
● : Line - up
Package quantity = 5 pcs.

### Replacing guide pads

Guide pads are subject to wear, like inserts

- Each guide pad has 2 corners.
- When the width of wear on the 1st corner reaches 70% of the width of guide pad, reverse the guide pad and use the 2nd corner.
- Replace the guide pad with a new one when the 2nd corner shows the same wear as on the 1st corner.



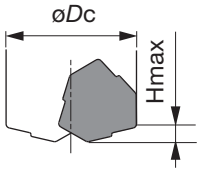
## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Cutting speed *Vc* (m/min) | Feed *f* (mm/rev) |
|---|---|---|---|
| P | Low carbon steel (C < 0.3)<br>E275A, E355D, C25, etc. | 80 - 140 | 0.05 - 0.1 |
| | Carbon steel (C > 0.3)<br>C45, C55, etc. | 80 - 140 | 0.05 - 0.2 |
| | Low alloy steel (C < 0.3)<br>18CrMo4, etc. | 80 - 140 | 0.05 - 0.2 |
| | Alloy steel (C > 0.3)<br>42CrMo4, 20Cr4, etc. | 80 - 120 | 0.05 - 0.2 |
| M | Stainless steel (Austenitic)<br>X5CrNi18-9, X5CrNiMo17-12-3, etc. | 60 - 100 | 0.05 - 0.1 |
| | Stainless steel (Martensitic, Ferritic)<br>X6Cr17, X12CrS13, etc. | 60 - 100 | 0.05 - 0.1 |
| | Stainless steel (Precipitation hardening)<br>X5CrNiCuNb16-4, etc. | 60 - 100 | 0.05 - 0.1 |
| K | Grey cast iron<br>250, etc. | 80 - 140 | 0.05 - 0.3 |
| | Ductile cast iron<br>600-3, etc. | 80 - 140 | 0.05 - 0.3 |
| N | Aluminium alloys | 100 - 200 | 0.05 - 0.2 |
| S | Heat-resistant alloys<br>Inconel 718, etc. | 20 - 50 | 0.04 - 0.1 |
| | Titanium alloys<br>Ti-6Al-4V, etc. | 30 - 60 | 0.05 - 0.15 |
| H | Hardened steel<br>≥ 40HRC | 50 - 100 | 0.04 - 0.1 |

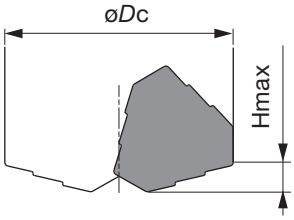
## SHAPES OF THE HOLE BOTTOM

| øDc | Insert | Maximum difference Hmax |
|---|---|---|
| 16 - 18 | TOHT08 | 2.166 |
| 18.01 - 20 | TOHT09 | 2.965 |
| 20.01 - 21.99 | TOHT10 | 3.158 |
| 22 - 25 | TOHT11 | 3.383 |
| 25.01 - 28 | TOHT12 | 3.63 |

**TOHT08...**

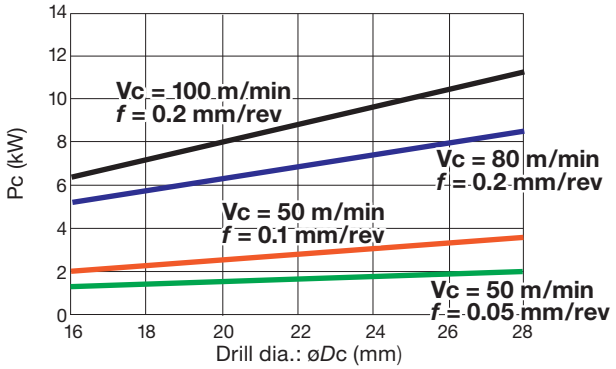



**TOHT09... - TOHT12...**

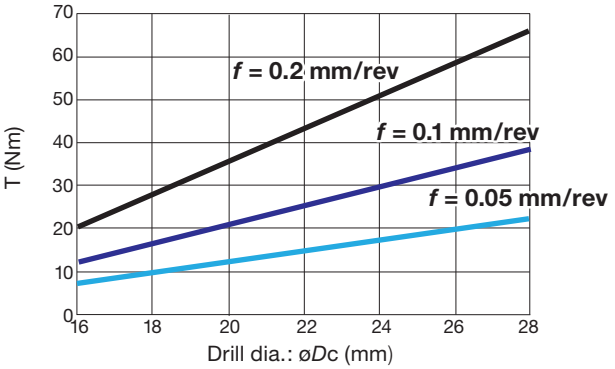


## REQUIRED SPINDLE POWER AND COOLANT PRESSURE

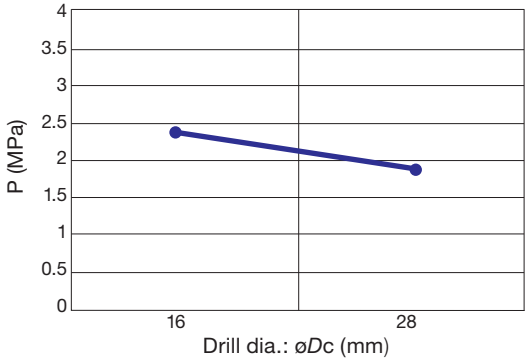
### Net power



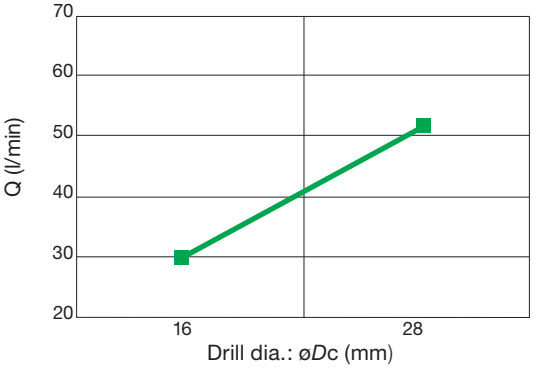

### Torque




### Coolant pressure (Recommended value)

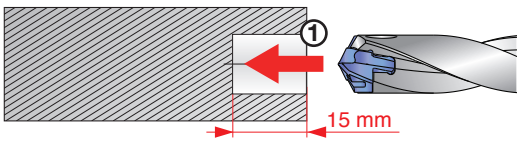



### Coolant flow rate (Recommended value)




## DRILLING PROCEDURE ON MACHINING CENTERS AND LATHES

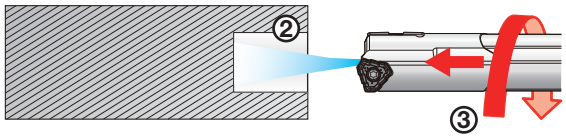
Proceed as instructed below in order to maximize the tool performance safely.




① Drill the guide hole

Hole diameter tolerance: +0.01 - +0.1 mm
Hole depth: H = 15 mm

Please use DrillMeister or TDX + EZ sleeve to make a guide hole

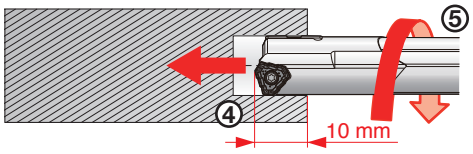



② Start coolant

③ Slowly insert DeepTriDrill into the guide hole

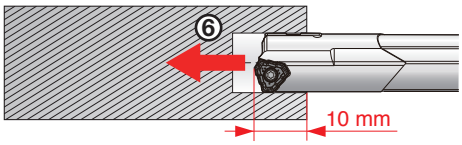
No. of revolution: $n$ = 50 - 100 $min^{-1}$
Feed speed: $Vf$ = 100 - 300 mm/min

**Caution: Do not rotate the drill at machining speed outside the hole**




④ Stop the drill at 10 mm depth

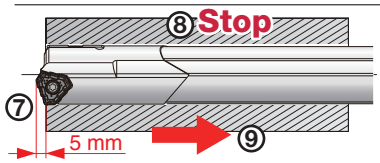
⑤ Start rotating at machining speed




⑥ Start feed

At the entrance (H = 10 - 15 mm)
→ Feed: $f$ = 80% of programmed feed

Hole depth: H ≥ 15 mm → Feed: $f$ = 100%



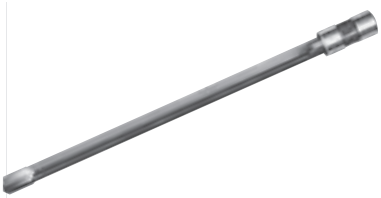

⑦ For through hole

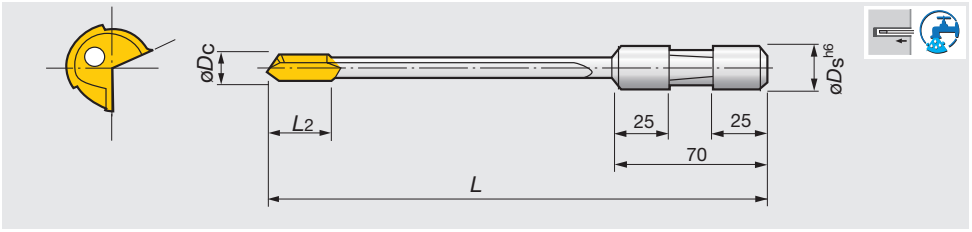
Continue drilling until the drill head passes through the workpiece by 5 mm

⑧ Stop the rotation and coolant

⑨ Return the drill (Head back to the starting position)

MEMO






| Designation | øDc | øDs | L2 | L |
|---|---|---|---|---|
| SLJ0300L0400NA | 3 | 12.7 | 15 | 400 |
| SLJ0300L0600NA | 3 | 12.7 | 15 | 600 |
| SLJ0500L0600NA | 5 | 12.7 | 25 | 600 |
| SLJ0550L0600NA | 5.5 | 19.05 | 25 | 600 |
| SLJ0600L0600NA | 6 | 19.05 | 25 | 600 |
| SLJ0700L0600NA | 7 | 19.05 | 25 | 600 |
| SLJ0800L0600NA | 8 | 19.05 | 25 | 600 |
| SLJ1000L0600NA | 10 | 19.05 | 30 | 600 |
| SLJ0500L1000NA | 5 | 12.7 | 25 | 1000 |
| SLJ0600L1000NA | 6 | 19.05 | 25 | 1000 |
| SLJ0700L1000NA | 7 | 19.05 | 25 | 1000 |
| SLJ0800L1000NA | 8 | 19.05 | 25 | 1000 |
| SLJ1000L1000NA | 10 | 19.05 | 30 | 1000 |
| SLJ0600L1250NA | 6 | 19.05 | 25 | 1250 |
| SLJ0610L1250NA | 6.1 | 19.05 | 25 | 1250 |
| SLJ0620L1250NA | 6.2 | 19.05 | 25 | 1250 |
| SLJ0700L1250NA | 7 | 19.05 | 25 | 1250 |
| SLJ0800L1250NA | 8 | 19.05 | 25 | 1250 |
| SLJ0810L1250NA | 8.1 | 19.05 | 25 | 1250 |
| SLJ0820L1250NA | 8.2 | 19.05 | 25 | 1250 |
| SLJ1000L1250NA | 10 | 19.05 | 30 | 1250 |
| SLJ1010L1250NA | 10.1 | 19.05 | 30 | 1250 |
| SLJ1020L1250NA | 10.2 | 19.05 | 30 | 1250 |
| SLJ1200L1250NA | 12 | 19.05 | 30 | 1250 |
| SLJ1210L1250NA | 12.1 | 19.05 | 30 | 1250 |
| SLJ1220L1250NA | 12.2 | 19.05 | 30 | 1250 |
| SLJ0600L1650NA | 6 | 19.05 | 25 | 1650 |
| SLJ0610L1650NA | 6.1 | 19.05 | 25 | 1650 |
| SLJ0620L1650NA | 6.2 | 19.05 | 25 | 1650 |
| SLJ0700L1650NA | 7 | 19.05 | 25 | 1650 |
| SLJ0800L1650NA | 8 | 19.05 | 25 | 1650 |
| SLJ0810L1650NA | 8.1 | 19.05 | 25 | 1650 |
| SLJ0820L1650NA | 8.2 | 19.05 | 25 | 1650 |
| SLJ1000L1650NA | 10 | 19.05 | 30 | 1650 |
| SLJ1010L1650NA | 10.1 | 19.05 | 30 | 1650 |
| SLJ1020L1650NA | 10.2 | 19.05 | 30 | 1650 |
| SLJ1200L1650NA | 12 | 19.05 | 30 | 1650 |
| SLJ1210L1650NA | 12.1 | 19.05 | 30 | 1650 |
| SLJ1220L1650NA | 12.2 | 19.05 | 30 | 1650 |

## TUBE DIAMETER

| øDc | øDp |
|---|---|
| 3 - 3.19 | 2.9 |
| 3.2 - 3.39 | 3.1 |
| 3.4 - 3.59 | 3.3 |
| 3.6 - 3.89 | 3.5 |
| 3.9 - 4.09 | 3.7 |
| 4.1 - 4.29 | 3.9 |
| 4.3 - 4.49 | 4.1 |
| 4.5 - 4.89 | 4.3 |
| 4.9 - 5.19 | 4.7 |

| øDc | øDp |
|---|---|
| 5.2 - 5.49 | 5 |
| 5.5 - 5.79 | 5.3 |
| 5.8 - 5.99 | 5.6 |
| 6 - 6.19 | 5.8 |
| 6.2 - 6.59 | 5.9 |
| 6.6 - 7.09 | 6.4 |
| 7.1 - 7.59 | 6.9 |
| 7.6 - 8.09 | 7.4 |
| 8.1 - 8.69 | 7.9 |

| øDc | øDp |
|---|---|
| 8.7 - 9.19 | 8.5 |
| 9.2 - 9.69 | 9 |
| 9.7 - 10.39 | 9.5 |
| 10.4 - 10.89 | 10 |
| 10.9 - 11.39 | 10.6 |
| 11.4 - 11.99 | 11.1 |
| 12 - 12.2 | 11.7 |

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Heat treatment | Hardness HB | Hardness HRC | Cutting speed *Vc* (m/min) | Feed *f* (mm/rev) |
|---|---|---|---|---|---|---|
| P | Free-cutting carbon steels | | 160 - 190 | (5) - (11) | 130 | Refer to Fig. 1 |
| | C10C ~ C15 | Cold drawn | | | | |
| | C30 ~ C50 | Cold drawn | 200 - 230 | (12) - 20 | 100 | |
| | C30 ~ C50 | Hardened and tempered | 250 - 300 | 25 - 32 | 80 | |
| | Carbon steels | | 110 ~ 120 | | 130 | |
| | C10 ~ C30 | Annealed | | | | |
| | C10 ~ C50 | Annealed | 120 ~ 185 | ~ (9) | 120 | |
| | C50 ~ | Annealed | 170 ~ 200 | (5) ~ (13) | 100 | |
| | C20 ~ C30 | Hardened and tempered | 210 ~ 250 | (16) ~ 24 | 90 | Refer to Fig. 2 |
| | C30 ~ C55 | Hardened and tempered | 260 ~ 310 | 26 ~ 33 | 70 | |
| | C50 ~ | Hardened and tempered | 320 ~ 375 | 34 ~ 40 | 50 | |
| | C55 ~ | Hardened and tempered | 380 ~ 440 | 41 ~ 47 | 40 | |
| | Alloy steels | Annealed | 150 ~ 230 | ~ (20) | 90 | Refer to Fig. 2 |
| | | Annealed or Hardened and tempered | 240 ~ 310 | 23 ~ 33 | 70 | Refer to Fig. 2 |
| | | | 315 ~ 370 | 34 ~ 40 | 50 | Refer to Fig. 3 |
| | | | 380 ~ 440 | 40 ~ 47 | 40 | |
| | | | 450 ~ 500 | 48 ~ 51 | 30 | |
| | Cast steels | Annealed | 140 ~ 180 | ~ (8) | 100 | Refer to Fig. 2 |
| | | Annealed | 190 ~ 240 | (11) ~ 22 | 90 | |
| | Tool steels | Annealed | 150 ~ 200 | ~ (13) | 70 | Refer to Fig. 3 |
| | | Annealed | 210 ~ 300 | (16) ~ 32 | 50 | |
| M | Stainless steels Ferritic X6Cr17 | Annealed | 150 ~ 200 | ~ (13) | 70 | Refer to Fig. 3 |
| | Austenitic X5CrNi18-9 | Annealed | 160 ~ 220 | ~ (18) | 50 | |
| | Martensitic X12Cr13 | Hardened and tempered | 160 ~ 220 | ~ (18) | 70 | |
| | | | 300 ~ 350 | 32 ~ 38 | 50 | |
| K | Grey cast irons | | 110 ~ 180 | | 90 | Refer to Fig. 4 |
| | | | 190 ~ 220 | | 80 | |
| | | | 220 ~ 260 | | 70 | |
| | Ductile cast irons | | 120 ~ 170 | | 80 | Refer to Fig. 5 |
| | | | 180 ~ 240 | | 65 | |
| | | | 240 ~ 280 | | 55 | |
| | | | 260 ~ 320 | | 40 | |
| | Malleable cast irons | | 110 ~ 180 | | 90 | |
| | | | 190 ~ 220 | | 80 | |
| | | | 220 ~ 260 | | 70 | |
| N | Cast aluminium alloys Aluminium die cast alloys | Annealed | 5000load | | 180 | Refer to Fig. 4 |
| | | | 40 ~ 100 | | | |
| | Copper alloys | Annealed | 120 ~ 160 | | < 150 | Refer to Fig. 4 |
| | | | 160 ~ 205 | | < 150 | Refer to Fig. 5 |
| H | Bearing steels | | 150 ~ 210 | | 70 | Refer to Fig. 3 |
| | High-resistant steels | | | | 20 | |
| | High speed steels | | 210 ~ 285 | (16) ~ 30 | 50 | |

- No. of revolutions: *n* (min$^{-1}$) = Cutting speed: *Vc* (m/min) × 1000 ÷ 3.14 ÷ Tool diameter: ø*Dc* (mm)
- Feed speed: *Vf* (mm/min) = No. of revolutions: *n* × Feed: *f* (mm/rev)

Fig. 1 Carbon steels

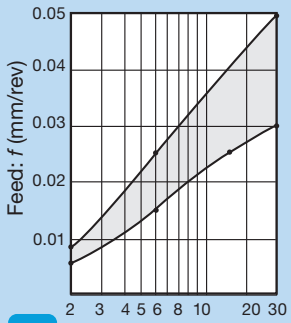
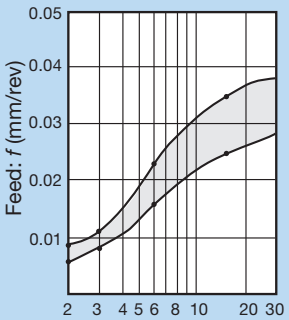
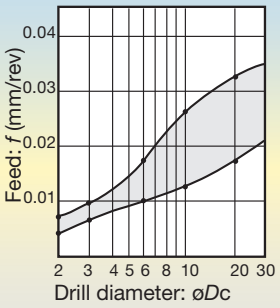



Fig. 2 Alloy steels



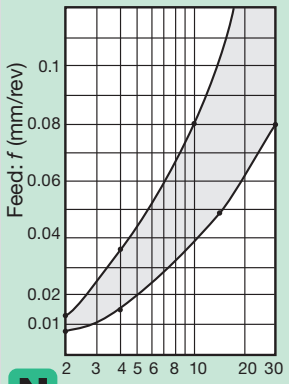

P

Fig. 3 Tool steels and other special steels



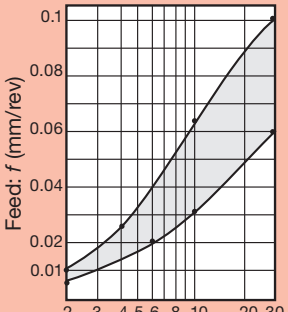

P M H

Fig. 4 Cast irons, aluminium alloys



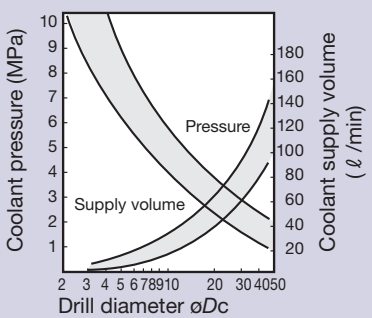

N

Fig. 5 Ductile and malleable cast irons




K

## Coolant supply pressure and volume




Deep Hole Drill

## Guidelines for attainable accuracies

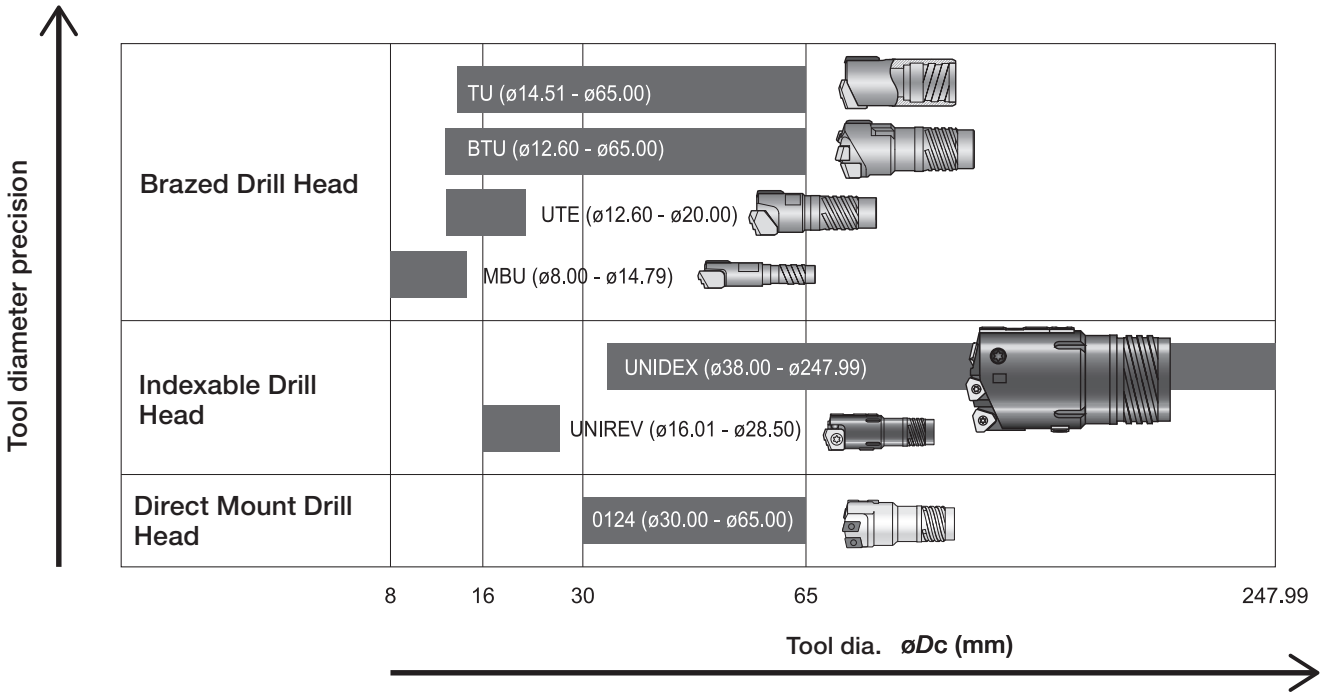
| Workpiece material | Surface roughness (µm) | Roundness (µm) | Cylindricity (µm) | Over size (µm) |
|---|---|---|---|---|
| Carbon and alloy steels | 6 ~ 25 | 5 ~ 10 | 10 ~ 15 | - 5 ~ 30 |
| Cast irons | 3 ~ 15 | 3 ~ 5 | 5 ~ 10 | - 5 ~ 15 |
| Aluminium alloys, Copper alloys | 0.3 ~ 6 | 3 ~ 5 | 5 ~ 10 | - 10 ~ 5 |

Note: Over size values given in the table are based on the drill diameter.

## Cutting fluid

A water-insoluble fluid is recommended in machining by gun drills. When using water soluble fluid, use the fluid for heavy duty cutting in higher concentration.

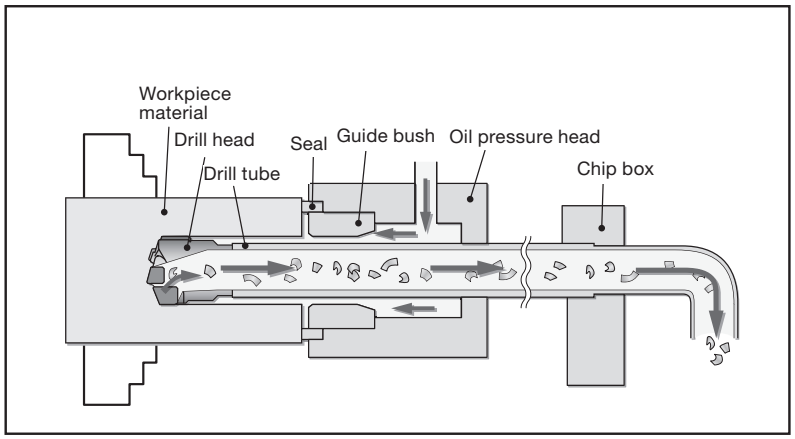
## BTA tool product map




## Single Tube System (STS) and Double Tube System (DTS)

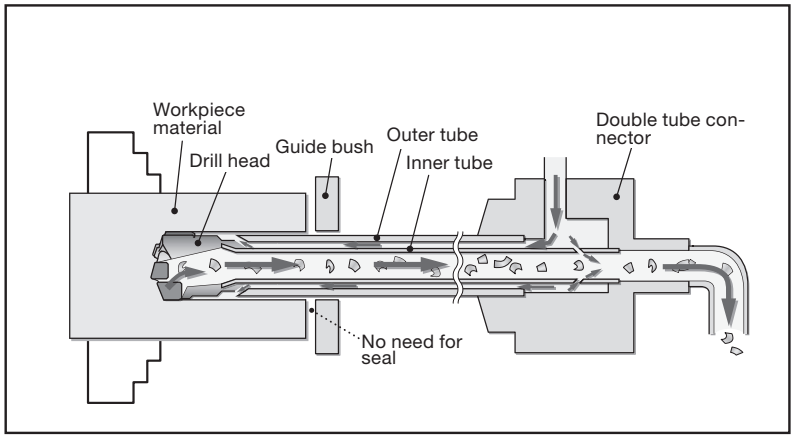
### Single Tube System (STS)

The STS may also be referred to as the BTA system in the deep hole drilling process.
A large volume of coolant is pumped under high pressure to the cutting area in the workpiece. Chips are then forced out through the drill tube at the back and they do not touch workpiece allowing super surface finish. STS is a very good method to obtain holes of high productivity and high accuracy by using a dedicated drilling machine and a sealing with the workpiece.




### Double Tube System (DTS)

The DTS is characterized by its two tube construction and is therefore known as the double tube system. A sealing system and pressure head, which is required in the Single Tube System (STS) is not necessary for the DTS and it is therefore suitable for conventional general purpose machines such as lathes or machining centers.
In general, because of less efficient chip evacuation than the STS the recommended max drilling depth is 1000mm. However, the unique DTC-R tube connector that is capable of supplying high pressure coolant can successfully achieve drilling depths of up to 2000mm.



# Single Tube System

## Solid Drilling Tools

| Mounting screw type | Code | Appearance | Diameter range øDc (mm) | Hole tolerance | Surface finish Ra (µm) | Drill head type | Feature |
|---|---|---|---|---|---|---|---|
| Outer Thread | **MBU** |  | 8 - 14.79 | IT9 | 2 | Brazed Drill Head | - Higher productivity and better surface finish than gundrill.<br>- Good chip breaking with 3 step cutting edge design. |
| | **UTE** |  | 12.6 - 20 | IT9 | 2 | | - Higher productivity and better surface finish than gundrill.<br>- Good chip breaking with 3 step cutting edge design.<br>- First recommendation for dia. ø12.60 - 15.59. |
| | **BTU** |  | 12.6 - 65 | IT9 | 2 | | - First recommendation for dia. ø15.60 or more.<br>- Good chip breaking with 3 cutting edges. (ø12.60 - 15.59mm has 2 cutting edges)<br>- Covers all materials with various carbide grade combinations. |
| | **KUSTS** |  | 38 - 247.99 | IT10 | 3 | Indexable Drill Head | - Cartridge type - Diameter finely adjustable<br>- Multiple options to cover various cutting condition. |
| | **0124** |  | 30 - 65 | IT11 | 3 | | - No diameter setting necessary.<br>- For highly efficient and stable deep hole drilling |
| Inner Thread | **KUSTS** |  | 38 - 245.99 | IT10 | 3 | Indexable Drill Head | - High productivity & High accuracy.<br>- Covers a wide application area with various options |
| | **0124** |  | 30 - 65 | IT11 | 3 | | - No diameter setting necessary.<br>- For highly efficient and stable deep hole drilling |

## Counterboring Tools

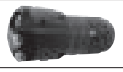
| Mounting screw type | Code | Appearance | Diameter range øDc (mm) | Hole tolerance | Surface finish Ra (µm) | Drill head type | Feature |
|---|---|---|---|---|---|---|---|
| Outer Thread | **KUSTR** |  | 25 - 291.99 | IT10 | 1 - 2 | Indexable Drill Head | - High productivity & High accuracy.<br>- Covers a wide application area with various options |
| Inner Thread | **KUSTR** |  | 25 - 293.99 | IT10 | 1 - 2 | | - High productivity & High accuracy.<br>- Covers a wide application area with various options |

## Trepanning Tools

| Mounting screw type | Code | Appearance | Diameter range øDc (mm) | Hole tolerance | Surface finish Ra (µm) | Drill head type | Feature |
|---|---|---|---|---|---|---|---|
| Outer Thread | **UTT** |  | 100 - | IT10 | 1 - 2 | Indexable Drill Head | - High productivity & High accuracy.<br>- Covers a wide application area with various options |
| Inner Thread | **UTT** |  | 100 - | IT10 | 1 - 2 | | - High productivity & High accuracy.<br>- Covers a wide application area with various options |

# Double Tube System

## Solid Drilling

| Mounting screw type | Code | Appearance | Diameter range øDc (mm) | Hole tolerance | Surface finish Ra (µm) | Drill head type | Feature |
|---|---|---|---|---|---|---|---|
| Outer Thread | **ETU** |  | 18.4 - 65 | IT9 | 2 | Brazed Drill Head | - Good chip breaking with 3-step cutting edges<br>- Covers all materials with various carbide grade combinations |
| | **KUDTS** |  | 18.4 - 183.99 | IT10 | 3 | Indexable Drill Head | - Cartridge type with adjustable diameter<br>- Covers a wide application area with various options |
| | **0124** |  | 30 - 65 | IT11 | 3 | | - Direct-mounting type avoid diameter setting<br>- For highly efficient and stable deep hole drilling |

## Counterboring

| Mounting screw type | Code | Appearance | Diameter range øDc (mm) | Hole tolerance | Surface finish Ra (µm) | Drill head type | Feature |
|---|---|---|---|---|---|---|---|
| Outer Thread | **KUDTR** |  | 25 - 183.99 | IT10 | 1 - 2 | Indexable Drill Head | - Cartridge type with adjustable diameter<br>- Covers a wide application area with various options |

- The above values may change depending on the machining conditions, materials, etc.
* Special designed tools are available as Tailor-made.

## Economical for middle r range deep hole drilling

- Diameter range 30 - 69 mm *
- Drilling depth 6xD - 14xD
- Shortened drilling time when using conventional machine

* Other diameters are available upon request.

## Effective machining on conventional machines

- Recommended for use on Horizontal M/C
- Can also be used on turning machine

## Good chip evacuation

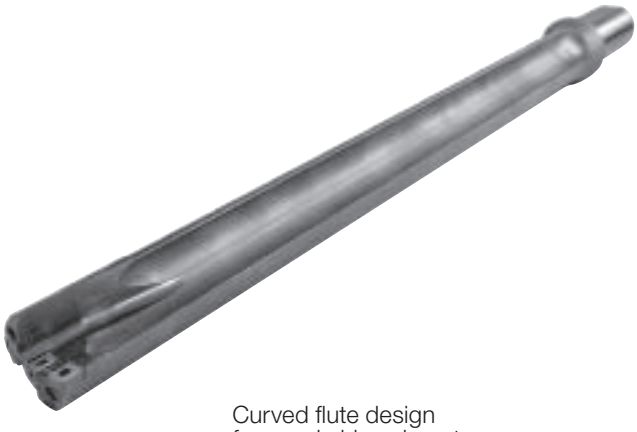
- Inserts enable best chip control
- Unique head design eliminates chip jamming
- Curved flute design ensures good chip evacuation

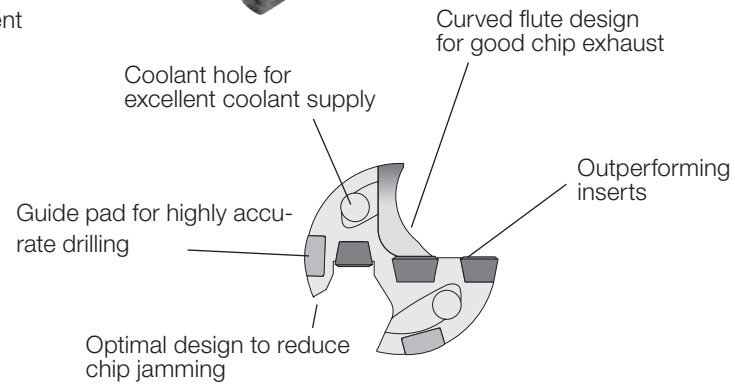
## Easy to use, rigid drill body

- Direct mount inserts, no diameter adjustment necessary
- Heat treated tool steel body

## High quality surface finish

- Burnishing effect improves surface finish
- Possible to eliminate finish process





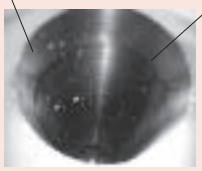

## Actual result

Cutting conditions

| | |
|---|---|
| Tool diameter ø*Dc* : | ø30 mm |
| Drilling depth : | 200 mm |
| Workpiece material : | C45 |
| Cutting speed *Vc* : | 100 m/min |
| Spindle speed *f* : | 0.1mm/rev |
| Machine : | BT50 M/C |

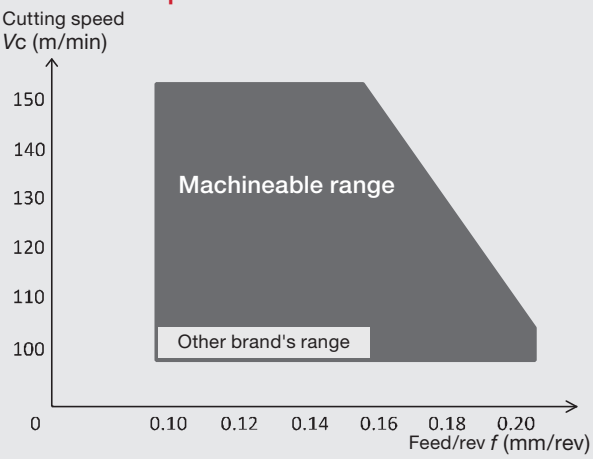
No spiral marks caused by chips

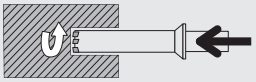
Guide pads burnishing effect improves surface finish



## BT50 M/C Machining data

**Excellent chip control ensures stable M/C machining**



Coolant
Type: Emulsion
Pressure: 1.5MPa
Supply: Through spindle
(for ISO50)

| | |
|---|---|
| Tool dia ø*Dc* : | ø30 mm |
| Drilling depth : | 200 mm |
| Material : | C45 |
| Cutting speed *Vc* : | 100 ~ 150 m/min |
| Feed/rev *f* : | 0.1 ~ 0.2 mm/rev |
| Machine : | ISO50 Horizontal M/C (Max 11 KW) |

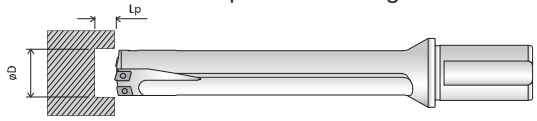
Deep Hole Drill

## Note:

To start the tool, a pilot hole is required.
(torelance: + 0.1 to 0.15 mm)

| Tool dia. ø*Dc* (mm) | Pilot hole length Lp (mm) |
|---|---|
| ø30 ~ ø39 | over 10 |
| ø39.01 ~ ø45 | over 12.5 |
| ø45.01 ~ ø57 | over 15 |
| ø57.01 ~ ø69 | over 17.5 |

- The pilot hole should ideally have a flat bottom, but generally a throw-away drill is
acceptable to create a pilot hole if the inner insert touches the bottom last.
- TDX drills are recommended for pre-hole drilling.



# ToolLine



# Tooling System

F002

# ToolLine - Tooling System



## TUNGCAP

Quick change system with polygon PSC coupling tooling

F046



## TUNGHOLD

Tooling system for holders with unique functions in wide varieties

DIN69871 - **F006** HSK A/E - **F020**

F004



## SPINJET

Coolant-driven high-speed spindles for small-diameter tools

F128



## BEAMWRENCH

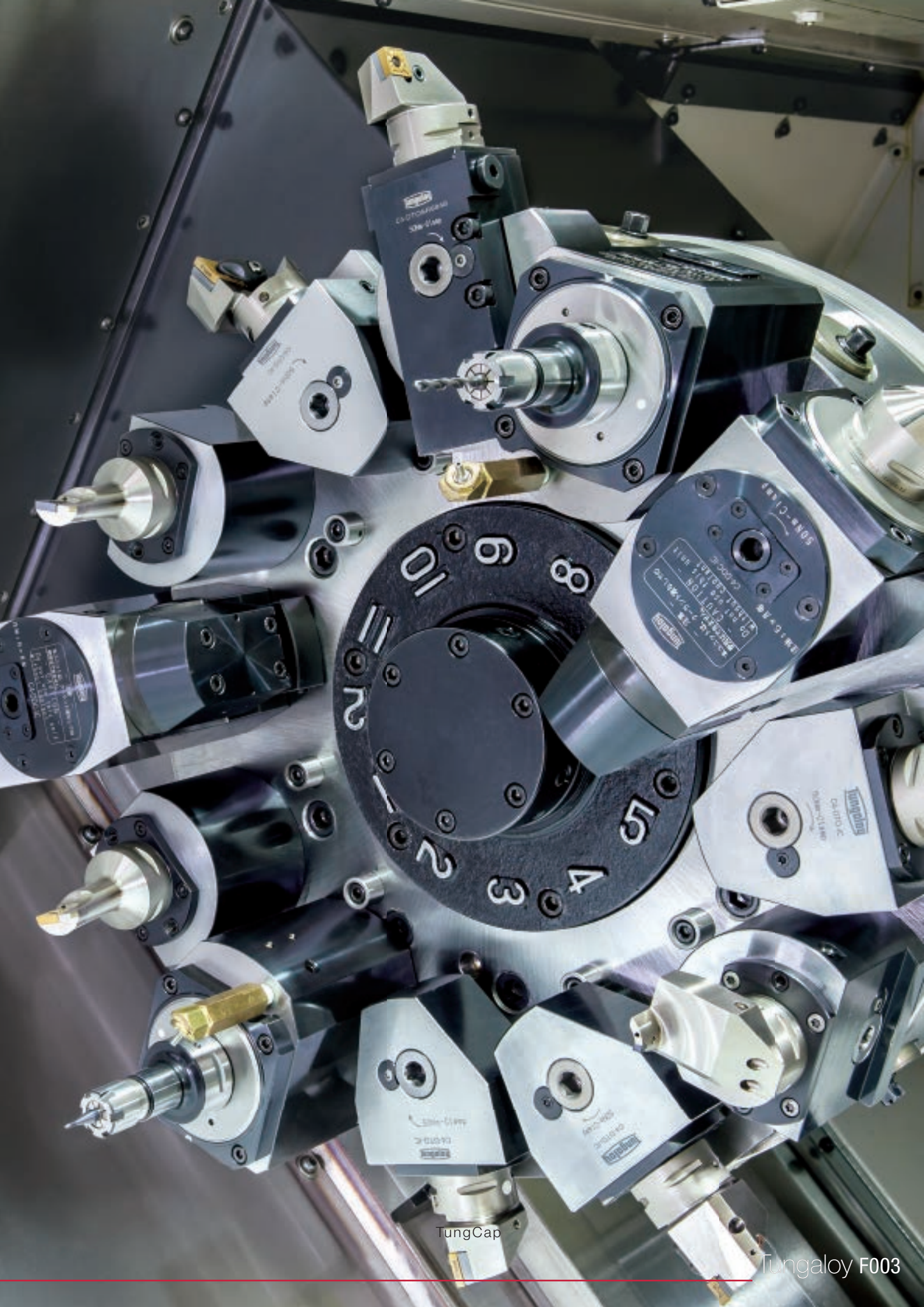
Easy operation with correct clamping torque

F134

## Other Tooling System

F136

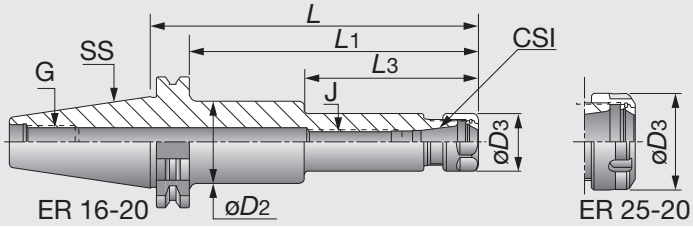

Boring System - F136
Top Borer Tool - F173
Boring Bar Tool - F170
Cartridge - F152



TungCap

# DIN69871-ER (Collet chuck holder )

ER collet chucks with DIN69871 shank




| Designation | SS | CSI | Range | L | L1 | L3 | øD3 | øD2 | J | G |
|---|---|---|---|---|---|---|---|---|---|---|
| DIN6987130ER16X63 (1) | 30 | ER16 | 0.5-10 | 63 | 43.9 | 28 | 28 | - | M10 | M12 |
| DIN6987140ER16X63 | 40 | ER16 | 0.5-10 | 63 | 43.9 | - | 28 | - | M12 | M16 |
| DIN6987140ER16X63B | 40 | ER16 | 0.5-10 | 63 | 43.9 | - | 28 | - | M12 | M16 |
| DIN6987140ER16X100 | 40 | ER16 | 0.5-10 | 100 | 80.9 | - | 28 | - | M12 | M16 |
| DIN6987140ER16X100B | 40 | ER16 | 0.5-10 | 100 | 80.9 | - | 28 | - | M12 | M16 |
| DIN6987140ER16X160 | 40 | ER16 | 0.5-10 | 160 | 140.9 | 85 | 28 | 40 | M12 | M16 |
| DIN6987140ER16X160B | 40 | ER16 | 0.5-10 | 160 | 140.9 | 85 | 28 | 40 | M12 | M16 |
| DIN6987140ER20X63 | 40 | ER20 | 1-13 | 63 | 43.9 | - | 34 | - | M12 | M16 |
| DIN6987140ER20X63B | 40 | ER20 | 1-13 | 63 | 43.9 | - | 34 | - | M12 | M16 |
| DIN6987140ER20X100 | 40 | ER20 | 1-13 | 100 | 80.9 | - | 34 | - | M12 | M16 |
| DIN6987140ER20X100B | 40 | ER20 | 1-13 | 100 | 80.9 | - | 34 | - | M12 | M16 |
| DIN6987140ER20X160 | 40 | ER20 | 1-13 | 160 | 140.9 | 91 | 34 | 44 | M12 | M16 |
| DIN6987150ER16X100 (1) | 50 | ER16 | 0.5-10 | 100 | 80.9 | - | 28 | - | M12 | M24 |
| DIN6987150ER16X100B | 50 | ER16 | 0.5-10 | 100 | 80.9 | - | 28 | - | M12 | M24 |
| DIN6987150ER16X160 (1) | 50 | ER16 | 0.5-10 | 160 | 140.9 | 85 | 28 | 40 | M12 | M24 |
| DIN6987150ER16X160B | 50 | ER16 | 0.5-10 | 160 | 140.9 | 85 | 28 | 40 | M12 | M24 |
| DIN6987150ER16X200 (1) | 50 | ER16 | 0.5-10 | 200 | 180.9 | 110 | 28 | 40 | M10 | M24 |
| DIN6987150ER16X200B | 50 | ER16 | 0.5-10 | 200 | 180.9 | 110 | 28 | 40 | M10 | M24 |
| DIN6987150ER20X100 (1) | 50 | ER20 | 1-13 | 100 | 80.9 | - | 34 | - | M12 | M24 |
| DIN6987150ER20X100B | 50 | ER20 | 1-13 | 100 | 80.9 | - | 34 | - | M12 | M24 |
| DIN6987150ER20X160 (1) | 50 | ER20 | 1-13 | 160 | 140.9 | 86 | 34 | 45 | M12 | M24 |
| DIN6987150ER20X160B | 50 | ER20 | 1-13 | 160 | 140.9 | 86 | 34 | 45 | M12 | M24 |
| DIN6987130ER32X65 (1) | 30 | ER32 | 2-20 | 65 | 45.9 | 32 | 50 | 40.4 | M18x1.5 | M12 |
| DIN6987140ER25X65 | 40 | ER25 | 1-16 | 65 | 45.9 | 28 | 42 | 32.4 | M16x2 | M16 |
| DIN6987140ER25X65B | 40 | ER25 | 1-16 | 65 | 45.9 | 28 | 42 | 32.4 | M16X2 | M16 |
| DIN6987140ER25X100 | 40 | ER25 | 1-16 | 100 | 80.9 | - | 42 | - | M16x2 | M16 |
| DIN6987140ER25X100B | 40 | ER25 | 1-16 | 100 | 80.9 | - | 42 | - | M16X2 | M16 |
| DIN6987140ER25X150 | 40 | ER25 | 1-16 | 150 | 130.9 | - | 42 | - | M16x2 | M16 |
| DIN6987140ER25X150B | 40 | ER25 | 1-16 | 150 | 130.9 | - | 42 | - | M16X2 | M16 |
| DIN6987140ER32X65 | 40 | ER32 | 2-20 | 65 | 45.9 | 32 | 50 | 40.4 | M22x1.5 | M16 |
| DIN6987140ER32X65B | 40 | ER32 | 2-20 | 65 | 45.9 | 32 | 50 | 40.4 | M22X1.5 | M16 |
| DIN6987140ER32X100 | 40 | ER32 | 2-20 | 100 | 80.9 | 35 | 50 | 49 | M22x1.5 | M16 |
| DIN6987140ER32X100B | 40 | ER32 | 2-20 | 100 | 80.9 | 35 | 50 | 49 | M22X1.5 | M16 |
| DIN6987140ER32X150 | 40 | ER32 | 2-20 | 150 | 130.9 | 35 | 50 | 49 | M22x1.5 | M16 |
| DIN6987140ER32X150B | 40 | ER32 | 2-20 | 150 | 130.9 | 35 | 50 | 49 | M22X1.5 | M16 |
| DIN6987140ER40X70 | 40 | ER40 | 3-26 | 70 | 50.9 | 32 | 63 | 50.4 | M28x1.5 | M16 |
| DIN6987140ER40X70B | 40 | ER40 | 3-26 | 70 | 50.9 | 32 | 63 | 50.4 | M28X1.5 | M16 |
| DIN6987140ER40X100 | 40 | ER40 | 3-26 | 100 | 80.9 | 32 | 63 | 50.4 | M28x1.5 | M16 |
| DIN6987140ER40X100B | 40 | ER40 | 3-26 | 100 | 80.9 | 32 | 63 | 50.4 | M28X1.5 | M16 |
| DIN6987150ER25X100 (1) | 50 | ER25 | 1-16 | 100 | 80.9 | - | 42 | - | M16x2 | M24 |
| DIN6987150ER25X100B | 50 | ER25 | 1-16 | 100 | 80.9 | - | 42 | - | M16X2 | M24 |
| DIN6987150ER25X150 (1) | 50 | ER25 | 1-16 | 150 | 130.9 | 80.9 | 42 | 50 | M16x2 | M24 |
| DIN6987150ER25X150B | 50 | ER25 | 1-16 | 150 | 130.9 | 80.9 | 42 | 50 | M16X2 | M24 |
| DIN6987150ER25X200 (1) | 50 | ER25 | 1-16 | 200 | 180.9 | 85 | 42 | 55 | M16x2 | M24 |
| DIN6987150ER25X200B | 50 | ER25 | 1-16 | 200 | 180.9 | 85 | 42 | 55 | M16X2 | M24 |
| DIN6987150ER32X100 (1) | 50 | ER32 | 2-20 | 100 | 80.9 | - | 50 | - | M22x1.5 | M24 |
| DIN6987150ER32X100B | 50 | ER32 | 2-20 | 100 | 80.9 | - | 50 | - | M22X1.5 | M24 |
| DIN6987150ER32X150 (1) | 50 | ER32 | 2-20 | 150 | 130.9 | - | 50 | - | M22x1.5 | M24 |
| DIN6987150ER32X150B | 50 | ER32 | 2-20 | 150 | 130.9 | - | 50 | - | M22X1.5 | M24 |
| DIN6987150ER32X200 (1) | 50 | ER32 | 2-20 | 200 | 180.9 | - | 50 | - | M22x1.5 | M24 |
| DIN6987150ER32X200B | 50 | ER32 | 2-20 | 200 | 180.9 | - | 50 | - | M22X1.5 | M24 |
| DIN6987150ER40X100 (1) | 50 | ER40 | 3-26 | 100 | 80.9 | - | 63 | - | M28x1.5 | M24 |
| DIN6987150ER40X100B | 50 | ER40 | 3-26 | 100 | 80.9 | - | 63 | - | M28X1.5 | M24 |
| DIN6987150ER40X150 (1) | 50 | ER40 | 3-26 | 150 | 130.9 | - | 63 | - | M28x1.5 | M24 |
| DIN6987150ER40X200 (1) | 50 | ER40 | 3-26 | 200 | 180.9 | - | 63 | - | M28x1.5 | M24 |
| DIN6987150ER40X200B | 50 | ER40 | 3-26 | 200 | 180.9 | - | 63 | - | M28X1.5 | M24 |
| DIN6987150ER50X100 (1) | 50 | ER50 | 10-34 | 100 | 80.9 | - | 78 | - | M36x1.5 | M24 |
| DIN6987150ER50X100B | 50 | ER50 | 10-34 | 100 | 80.9 | - | 78 | - | M36X1.5 | M24 |
| DIN6987150ER50X150 (1) | 50 | ER50 | 10-34 | 150 | 130.9 | - | 78 | - | M36x1.5 | M24 |

• Add B for coolant through the flange. (1) Balanced to G6.3 12,000 min$^{-1}$.

(Option:Wrench for ER collet)

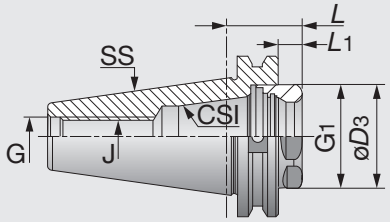
Tooling System

ER-collet F095 | Nut F119 | Wrench F121 | Preset screws F122 | Pull stud F118

## TUNGBALANCE

### DIN69871-ER-SHORT (Collet chuck holder for short overhang)

TungShort collet chucks with DIN69871 shank




| Designation | SS | CSI | Range | *L* | *L*1 | ø*D*3 | J | G | G1 |
|---|---|---|---|---|---|---|---|---|---|
| DIN6987140ER32SHORT | 40 | ER32 | 2-20 | 28.6 | 9.5 | 40 | M16 | M16 | M40x1.5 |
| DIN6987150ER32SHORT | 50 | ER32 | 2-20 | 28.6 | 9.5 | 40 | M22x1.5 | M24 | M40x1.5 |
| DIN6987150ER40SHORT | 50 | ER40 | 3-26 | 28.6 | 9.5 | 50 | M28x1.5 | M24 | M50x1.5 |

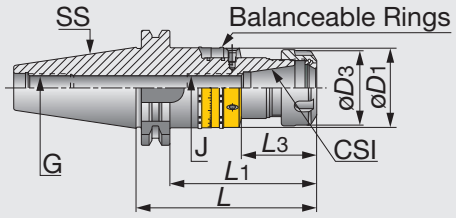
• Add B for coolant through the flange.

(Option:Wrench for ER collet)

## TUNGBALANC

### DIN69871-ER BIN (Collet chuck holder)

TungBalance adjustable dynamic balance collet chuck holder with DIN69871 shank




| Designation | SS | CSI | Range | *L* | *L*1 | *L*3 | ø*D*3 | ø*D*1 | J | G |
|---|---|---|---|---|---|---|---|---|---|---|
| DIN6987140ER16X100BIN | 40 | ER16 | 0.5-10 | 100 | 80.9 | 44 | 28 | 44 | M10 | M16 |
| DIN6987140ER20X100BIN | 40 | ER20 | 1.0-13 | 100 | 80.9 | 51 | 34 | 44 | M12 | M16 |
| DIN6987140ER20X160BIN | 40 | ER20 | 1.0-13 | 160 | 140.9 | 87 | 34 | 44 | M12 | M16 |
| DIN6987140ER25X100BIN | 40 | ER25 | 1.0-16 | 100 | 80.9 | 51 | 42 | 44 | M16x1.5 | M16 |
| DIN6987140ER25X160BIN | 40 | ER25 | 1.0-16 | 160 | 140.9 | 88 | 42 | 44 | M16x1.5 | M16 |
| DIN6987140ER32X100BIN | 40 | ER32 | 2.0-20 | 100 | 80.9 | 36 | 50 | 60 | M22x1.5 | M16 |
| DIN6987140ER40X100BIN | 40 | ER40 | 3.0-26 | 100 | 80.9 | 36 | 63 | 60 | M28x1.5 | M16 |

• Balanced to G2.5 20,000 min$^{-1}$.

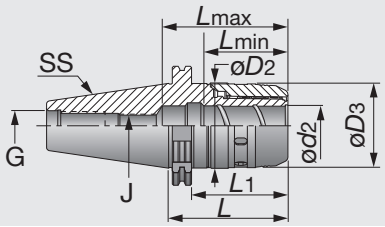
(Option:Wrench for ER collet)



ER Collet F095 | Nut F119 | Wrench F121 | Preset screws F122 | Pull stud F118

## DIN69871-TUNGMAX (Power chuck holder)

TungMax endmill chuck holders with DIN69871 shank



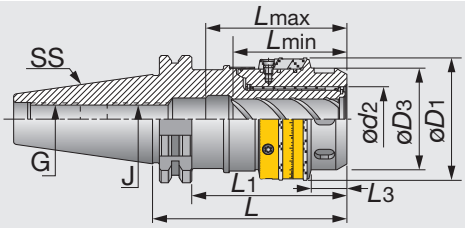

| Designation | SS | ød2 | Range | L | L1 | Lmin | Lmax | øD3 | øD2 | J | G |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DIN6987140MAXIN20X95 | 40 | 20 | 6-20 | 95 | 76 | 56 | 69 | 51 | 53 | M16 | M16 |
| DIN6987140MAXIN32X106 | 40 | 32 | 6-32 | 106 | 87 | 70 | 83 | 69 | 70 | M16 | M16 |
| DIN6987150MAXIN20X105 (1) | 50 | 20 | 6-20 | 105 | 86 | 56 | 69 | 51 | 53 | M16 | M24 |
| DIN6987150MAXIN20X105B | 50 | 20 | 6-20 | 105 | 86 | 56 | 69 | 51 | 53 | M16 | M24 |
| DIN6987150MAXIN32X100 (1) | 50 | 32 | 6-32 | 100 | 81 | 70 | 84 | 69 | 70 | M20x2 | M24 |
| DIN6987150MAXIN32X100B | 50 | 32 | 6-32 | 100 | 81 | 70 | 84 | 69 | 70 | M20X2 | M24 |
| DIN6987150MAXIN32X135 (1) | 50 | 32 | 6-32 | 135 | 116 | 71 | 85 | 69 | 70 | M20x2 | M24 |

• Add B for coolant through the flange. (1) Balanced to G6.3 8,000 $min^{-1}$.

(Option:Wrench for TungMax collet)

## DIN69871-TUNGMAX BIN (Power chuck holder)

TungMax balancable endmill chuck holders with DIN69871 shank




| Designation | SS | ød2 | Range | øD3 | øD1 | L | L1 | L3 | Lmin | Lmax | J | G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DIN6987140MAXIN20X95BIN (1) | 40 | 20 | 6-20 | 50.5 | 60.8 | 95 | 76 | 17.5 | 56 | 69 | M16 | M16 |
| DIN6987140MAXI32X106BIN (1) | 40 | 32 | 6-32 | 68.5 | 79.8 | 106 | 87 | 24.9 | 70 | 83 | M16 | M16 |
| DIN6987150MAXIN20X105BIN (1) | 50 | 20 | 6-20 | 50.5 | 60.8 | 105 | 86 | 17.5 | 56 | 69 | M16 | M24 |
| DIN6987150MAXIN32X100BIN (2) | 50 | 32 | 6-32 | 68.5 | 79.8 | 100 | 81 | 24.9 | 70 | 84 | M20X2 | M24 |

(1) Chucks with taper size 40 can be balanced by the balancing ring up to G2.5 at 20,000 $min^{-1}$.
(2) Chucks with taper size 50 can be balanced by the balancing ring up to G2.5 at 18,000 $min^{-1}$.

(Option:Wrench for TungMax collet)

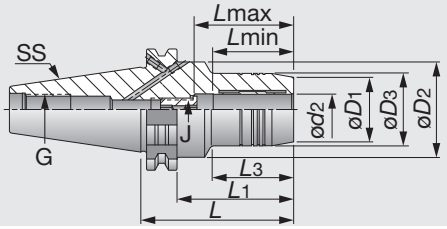


Straight collet F105
Pull stud F118

# TUNGHYDRO

## DIN69871-HYDRO (Hydro chuck holder)

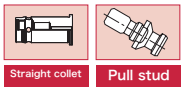
TungHydro hydraulic endmill chuck holders with DIN69871 shank




| Designation | SS | ød2 | øD1 | øD3 | øD2 | L | L1 | L3 | Lmin | Lmax | J | G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DIN6987130HYDRO6X60 | 30 | 6 | 23 | 26. | 45 | 60 | 41 | 25 | 27 | 37 | M5 | M12 |
| DIN6987130HYDRO16X90 | 30 | 16 | 34 | 38 | 45 | 90 | 71 | 43 | 42 | 52 | M12x1 | M12 |
| DIN6987130HYDRO20X90 | 30 | 20 | 38 | 42 | 42 | 90 | 71 | - | 42 | 52 | M12x1 | M12 |
| DIN6987140HYDRO6X68 | 40 | 6 | 23 | 26 | 50 | 68 | 49 | 33 | 27 | 37 | M5 | M16 |
| DIN6987140HYDRO8X68 | 40 | 8 | 25 | 28 | 50 | 68 | 49 | 33 | 27 | 37 | M6 | M16 |
| DIN6987140HYDRO10X72 | 40 | 10 | 27 | 30 | 50 | 72 | 53 | 37 | 32 | 42 | M8x1 | M16 |
| DIN6987140HYDRO12X77 | 40 | 12 | 29 | 32 | 50 | 77 | 58 | 42 | 37 | 47 | M10x1 | M16 |
| DIN6987140HYDRO14X77 | 40 | 14 | 30 | 34 | 50 | 77 | 58 | 42 | 37 | 47 | M10x1 | M16 |
| DIN6987140HYDRO16X80 | 40 | 16 | 34 | 38 | 50 | 80 | 61 | 43 | 42 | 52 | M12x1 | M16 |
| DIN6987140HYDRO18X80 | 40 | 18 | 36 | 40 | 50 | 80 | 61 | 43 | 42 | 52 | M12x1 | M16 |
| DIN6987140HYDRO20X82 | 40 | 20 | 38 | 42 | 50 | 82 | 63 | 47 | 42 | 52 | M12x1 | M16 |
| DIN6987140HYDRO25X117 | 40 | 25 | 46 | 50 | 63 | 117 | 98 | 51 | 48 | 58 | M16x1 | M16 |
| DIN6987140HYDRO32X117 | 40 | 32 | 56 | 60 | 63 | 117 | 98 | 56 | 52 | 62 | M16x1 | M16 |
| DIN6987150HYDRO6X68 | 50 | 6 | 23 | 26 | 80 | 68 | 49 | 33 | 27 | 37 | M5 | M24 |
| DIN6987150HYDRO8X68 | 50 | 8 | 25 | 28 | 80 | 68 | 49 | 33 | 27 | 37 | M6 | M24 |
| DIN6987150HYDRO10X72 | 50 | 10 | 27 | 30 | 80 | 72 | 53 | 37 | 32 | 42 | M8x1 | M24 |
| DIN6987150HYDRO12X77 | 50 | 12 | 29 | 32 | 80 | 77 | 58 | 42 | 37 | 47 | M10x1 | M24 |
| DIN6987150HYDRO14X77 | 50 | 14 | 30 | 34 | 80 | 77 | 58 | 42 | 37 | 47 | M10x1 | M24 |
| DIN6987150HYDRO16X80 | 50 | 16 | 34 | 38 | 80 | 80 | 61 | 45 | 42 | 52 | M12x1 | M24 |
| DIN6987150HYDRO18X80 | 50 | 18 | 36 | 40 | 80 | 80 | 61 | 45 | 42 | 52 | M12x1 | M24 |
| DIN6987150HYDRO20X82 | 50 | 20 | 38 | 42 | 80 | 82 | 63 | 47 | 42 | 52 | M16x1 | M24 |
| DIN6987150HYDRO25X87 | 50 | 25 | 46 | 50 | 80 | 87 | 68 | 52 | 48 | 58 | M16x1 | M24 |
| DIN6987150HYDRO32X91 | 50 | 32 | 56 | 60 | 80 | 91 | 72 | 56 | 54 | 64 | M16x1 | M24 |
| DIN6987140HYDRO20X64.5 (1) | 40 | 20 | 40 | 49.5 | - | 64.5 | 45 | - | 42 | 52 | M16x1 | M16 |
| DIN6987150HYDRO32X81 (1) | 50 | 32 | 56 | 72 | - | 81 | 62 | - | 54 | 64 | M16x1 | M24 |

• Clamping wrench (wrench HYDRO HEX 4) should be ordered separately. • Note: Available are reduction sleeves for 12, 20, 25 and 32 mm bore diameters.
• Chucking forces will significantly reduce if reduction sleeves are used (ordered separately).
(1) Holders for heavy duty.

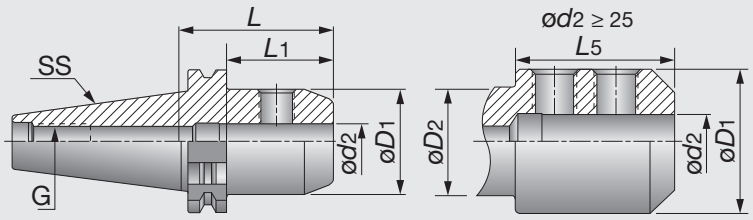





F107 F118

# DIN69871-EM (Endmill holder)

Screw locking endmill holders with DIN69871 shank




| Designation | SS | ød2 | øD1 | øD2 | L | L1 | L5 | G |
|---|---|---|---|---|---|---|---|---|
| DIN6987130EM6X50 | 30 | 6 | 26 | - | 50 | 30.9 | - | M12 |
| DIN6987130EM8X50 | 30 | 8 | 28 | - | 50 | 30.9 | - | M12 |
| DIN6987130EM10X50 | 30 | 10 | 35 | - | 50 | 30.9 | - | M12 |
| DIN6987130EM14X63 | 30 | 14 | 44 | - | 63 | 43.9 | - | M12 |
| DIN6987130EM16X63 | 30 | 16 | 48 | 44.9 | 63 | 43.9 | 28 | M12 |
| DIN6987130EM18X72 | 30 | 18 | 50 | 44.9 | 72 | 52.9 | 37 | M12 |
| DIN6987130EM20X72 | 30 | 20 | 52 | 44 | 72 | 52.9 | 37 | M12 |
| DIN6987140EM6X50 | 40 | 6 | 25 | - | 50 | 30.9 | - | M16 |
| DIN6987140EM6X50B | 40 | 6 | 25 | - | 50 | 30.9 | - | M16 |
| DIN6987140EM8X50 | 40 | 8 | 28 | - | 50 | 30.9 | - | M16 |
| DIN6987140EM8X50B | 40 | 8 | 28 | - | 50 | 30.9 | - | M16 |
| DIN6987140EM10X50 | 40 | 10 | 35 | - | 50 | 30.9 | - | M16 |
| DIN6987140EM12X50 | 40 | 12 | 42 | - | 50 | 30.9 | - | M16 |
| DIN6987140EM12X50B | 40 | 12 | 42 | - | 50 | 30.9 | - | M16 |
| DIN6987140EM14X63 | 40 | 14 | 44 | - | 63 | 43.9 | - | M16 |
| DIN6987140EM16X63 | 40 | 16 | 48 | - | 63 | 43.9 | - | M16 |
| DIN6987140EM16X63B | 40 | 16 | 48 | - | 63 | 43.9 | - | M16 |
| DIN6987140EM18X63 | 40 | 18 | 50 | 49 | 63 | 43.9 | 28.5 | M16 |
| DIN6987140EM18X63B | 40 | 18 | 50 | 49 | 63 | 43.9 | 28.5 | M16 |
| DIN6987140EM20X63 | 40 | 20 | 52 | 49 | 63 | 43.9 | 28.5 | M16 |
| DIN6987140EM20X63B | 40 | 20 | 52 | 49 | 63 | 43.9 | 28.5 | M16 |
| DIN6987140EM25X100 | 40 | 25 | 65 | 49 | 100 | 80.9 | 65 | M16 |
| DIN6987140EM25X100B | 40 | 25 | 65 | 49 | 100 | 80.9 | 65 | M16 |
| DIN6987140EM32X100 | 40 | 32 | 71 | 49 | 100 | 80.9 | 65 | M16 |
| DIN6987140EM32X100B | 40 | 32 | 71 | 49 | 100 | 80.9 | 65 | M16 |
| DIN6987150EM6X63 | 50 | 6 | 25 | - | 63 | 43.9 | - | M24 |
| DIN6987150EM8X63 | 50 | 8 | 28 | - | 63 | 43.9 | - | M24 |
| DIN6987150EM8X63B | 50 | 8 | 28 | - | 63 | 43.9 | - | M24 |
| DIN6987150EM10X63 | 50 | 10 | 35 | - | 63 | 43.9 | - | M24 |
| DIN6987150EM10X63B | 50 | 10 | 35 | - | 63 | 43.9 | - | M24 |
| DIN6987150EM12X63 | 50 | 12 | 42 | - | 63 | 43.9 | - | M24 |
| DIN6987150EM12X63B | 50 | 12 | 42 | - | 63 | 43.9 | - | M24 |
| DIN6987150EM14X63 | 50 | 14 | 44 | - | 63 | 43.9 | - | M24 |
| DIN6987150EM14X63B | 50 | 14 | 44 | - | 63 | 43.9 | - | M24 |
| DIN6987150EM16X63 | 50 | 16 | 48 | - | 63 | 43.9 | - | M24 |
| DIN6987150EM16X63B | 50 | 16 | 48 | - | 63 | 43.9 | - | M24 |
| DIN6987150EM18X63 | 50 | 18 | 50 | - | 63 | 43.9 | - | M24 |
| DIN6987150EM18X63B | 50 | 18 | 50 | - | 63 | 43.9 | - | M24 |
| DIN6987150EM20X63 | 50 | 20 | 52 | - | 63 | 43.9 | - | M24 |
| DIN6987150EM20X63B | 50 | 20 | 52 | - | 63 | 43.9 | - | M24 |
| DIN6987150EM25X80 | 50 | 25 | 65 | - | 80 | 60.9 | - | M24 |
| DIN6987150EM25X80B | 50 | 25 | 65 | - | 80 | 60.9 | - | M24 |
| DIN6987150EM32X100 | 50 | 32 | 72 | - | 100 | 80.9 | - | M24 |
| DIN6987150EM32X100B | 50 | 32 | 72 | - | 100 | 80.9 | - | M24 |
| DIN6987150EM40X100 | 50 | 40 | 90 | 79.9 | 100 | 80.9 | 43 | M24 |
| DIN6987150EM40X100B | 50 | 40 | 90 | 79.9 | 100 | 80.9 | 43 | M24 |
| DIN6987150EM50X125 | 50 | 50 | 98 | 79.9 | 125 | 105.9 | 90 | M24 |
| DIN6987150EM50X125B | 50 | 50 | 98 | 79.9 | 125 | 105.9 | 90 | M24 |
| DIN6987140EM10X45 (1) | 40 | 10 | 35 | - | 45 | 25.9 | - | M16 |
| DIN6987140EM12X45 (1) | 40 | 12 | 42 | - | 45 | 25.9 | - | M16 |
| DIN6987140EM14X45 (1) | 40 | 14 | 44 | - | 45 | 25.9 | - | M16 |
| DIN6987140EM14X45B (1) | 40 | 14 | 44 | - | 45 | 25.9 | - | M16 |
| DIN6987140EM16X45 (1) | 40 | 16 | 48 | - | 45 | 25.9 | - | M16 |
| DIN6987140EM18X45 (1) | 40 | 18 | 49 | - | 45 | 25.9 | - | M16 |
| DIN6987140EM20X45 (1) | 40 | 20 | 49 | - | 45 | 25.9 | - | M16 |
| DIN6987140EM25X45 (1) | 40 | 25 | 49 | - | 45 | 25.9 | - | M16 |

• Add B for coolant through the flange.
(1) Short emdmill holder.

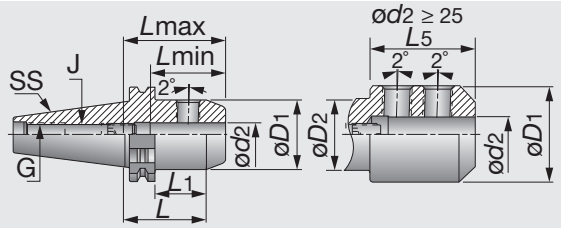


Clamping screw F124
Pull stud F118

TUNGHOLD

## DIN69871-EM E(Endmill holder with whistle notch)

Screw locking endmill holders for whistle notch with DIN69871 shank




| Designation | SS | ød2 | øD1 | øD2 | L | L1 | L5 | Lmin | Lmax | J(1) | G | key |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DIN6987140EM8X50E | 40 | 8 | 28 | - | 50 | 30.9 | - | 35 | 45 | M6 | M16 | 3 |
| DIN6987140EM10X50E | 40 | 10 | 35 | - | 50 | 30.9 | - | 39 | 49 | M8 | M16 | 4 |
| DIN6987140EM12X50E | 40 | 12 | 42 | - | 50 | 30.9 | - | 44 | 54 | M10 | M16 | 5 |
| DIN6987140EM14X63E | 40 | 14 | 44 | - | 63 | 43.9 | - | 44 | 54 | M10 | M16 | 5 |
| DIN6987140EM16X63E | 40 | 16 | 48 | - | 63 | 43.9 | - | 47 | 57 | M12 | M16 | 6 |
| DIN6987140EM18X63E | 40 | 18 | 50 | 49 | 63 | 43.9 | 28.5 | 47 | 57 | M12 | M16 | 6 |
| DIN6987140EM20X63E | 40 | 20 | 52 | 49 | 63 | 43.9 | 29 | 49 | 59 | M16 | M16 | 8 |
| DIN6987140EM20X63EB | 40 | 20 | 52 | 49 | 63 | 43.9 | 29 | 49 | 59 | M16 | M16 | 8 |
| DIN6987140EM25X100E | 40 | 25 | 65 | 49 | 100 | 80.9 | 65 | 54 | 64 | M20X1.5 | M16 | 10 |
| DIN6987140EM25X100EB | 40 | 25 | 65 | 49 | 100 | 80.9 | 65 | 54 | 64 | M20X1.5 | M16 | 10 |
| DIN6987140EM32X100E | 40 | 32 | 72 | 49 | 100 | 80.9 | 65 | 58 | 68 | M20X1.5 | M16 | 10 |
| DIN6987150EM8X63E | 50 | 8 | 28 | - | 63 | 43.9 | - | 35 | 45 | M6 | M24 | 3 |
| DIN6987150EM10X63E | 50 | 10 | 35 | - | 63 | 43.9 | - | 39 | 49 | M8 | M24 | 4 |
| DIN6987150EM12X63E | 50 | 12 | 42 | - | 63 | 43.9 | - | 44 | 54 | M10 | M24 | 5 |
| DIN6987150EM14X63E | 50 | 14 | 44 | - | 63 | 43.9 | - | 44 | 54 | M10 | M24 | 5 |
| DIN6987150EM16X63E | 50 | 16 | 48 | - | 63 | 43.9 | - | 47 | 57 | M12 | M24 | 6 |
| DIN6987150EM18X63E | 50 | 18 | 50 | - | 63 | 43.9 | - | 47 | 57 | M12 | M24 | 6 |
| DIN6987150EM20X63E | 50 | 20 | 52 | - | 63 | 43.9 | - | 49 | 49 | M16 | M24 | 8 |
| DIN6987150EM20X63EB | 50 | 20 | 52 | - | 63 | 43.9 | - | 49 | 49 | M16 | M24 | 8 |
| DIN6987150EM25X80E | 50 | 25 | 65 | - | 80 | 60.9 | - | 54 | 64 | M20X1.5 | M24 | 10 |
| DIN6987150EM25X80EB | 50 | 25 | 65 | - | 80 | 60.9 | - | 54 | 64 | M20X1.5 | M24 | 10 |
| DIN6987150EM32X100E | 50 | 32 | 72 | - | 100 | 80.9 | - | 58 | 68 | M20X1.5 | M24 | 10 |
| DIN6987150EM32X100EB | 50 | 32 | 72 | - | 100 | 80.9 | - | 58 | 68 | M20X1.5 | M24 | 10 |
| DIN6987150EM40X100E | 50 | 40 | 90 | 79.9 | 100 | 80.9 | 43 | 68 | 78 | M20X1.5 | M24 | 10 |
| DIN6987150EM40X100EB | 50 | 40 | 90 | 79.9 | 100 | 80.9 | 43 | 68 | 78 | M20X1.5 | M24 | 10 |
| DIN6987150EM50X125EB | 50 | 50 | 98 | 79.9 | 125 | 105.9 | 68 | 78 | 88 | M20X1.5 | M24 | 10 |

• Add B for coolant through the flange. (1) The adjustment screw has an internal coolant hole.

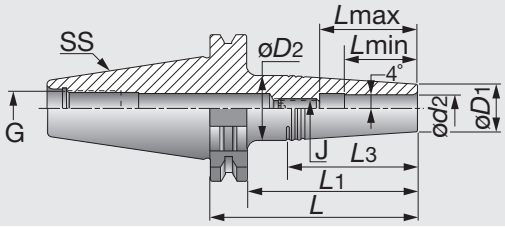
Tooling System

Clamping screw F124
Pull stud F118

# TUNGSHRINK

## DIN69871-SRK (Shrink holder)

TungShrink thermal shrinking holder for carbide shank with DIN69871 shank




| Designation | SS | ød2 | øD1 | øD2 | L | L1 | L3 | Lmin | Lmax | J | G | key |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DIN6987140SRK3X50 | 40 | 3 | 10 | 15 | 69.1 | 50 | 35.55 | 10 | 16 | M6 | M16 | 3 |
| DIN6987140SRK3X85 | 40 | 3 | 10 | 19 | 104.1 | 85 | 64.15 | 10 | 16 | M6 | M16 | 3 |
| DIN6987140SRK4X50 | 40 | 4 | 10 | 15 | 69.1 | 50 | 35.55 | 12 | 18 | M6 | M16 | 3 |
| DIN6987140SRK4X85 | 40 | 4 | 10 | 19 | 104.1 | 85 | 64.15 | 12 | 18 | M6 | M16 | 3 |
| DIN6987140SRK5X50 | 40 | 5 | 10 | 15 | 69.1 | 50 | 35.55 | 15 | 21 | M6 | M16 | 3 |
| DIN6987140SRK5X85 | 40 | 5 | 10 | 19 | 104.1 | 85 | 64.15 | 12 | 18 | M6 | M16 | 3 |
| DIN6987140SRK6X50 | 40 | 6 | 11 | 16 | 69.1 | 50 | 35.55 | 18 | 24 | M8 | M16 | 4 |
| DIN6987140SRK6X85 | 40 | 6 | 11 | 20 | 104.1 | 85 | 64.1 | 18 | 24 | M8 | M16 | 4 |
| DIN6987140SRK8X50 | 40 | 8 | 14 | 20 | 69.1 | 50 | 42.5 | 25 | 31 | M10 | M16 | 5 |
| DIN6987140SRK8X85 | 40 | 8 | 14 | 23 | 104.1 | 85 | 63.95 | 25 | 31 | M10 | M16 | 5 |
| DIN6987140SRK10X50 | 40 | 10 | 16 | 22 | 69.1 | 50 | 42.4 | 30 | 36 | M12 | M16 | 6 |
| DIN6987140SRK10X85 | 40 | 10 | 16 | 24.5 | 104.1 | 85 | 60.28 | 30 | 36 | M12 | M16 | 6 |
| DIN6987140SRK12X50 | 40 | 12 | 20 | 26 | 69.1 | 50 | 42.3 | 32 | 42 | M10 | M16 | 5 |
| DIN6987140SRK12X85 | 40 | 12 | 20 | 28 | 104.1 | 85 | 56.6 | 32 | 42 | M10 | M16 | 5 |

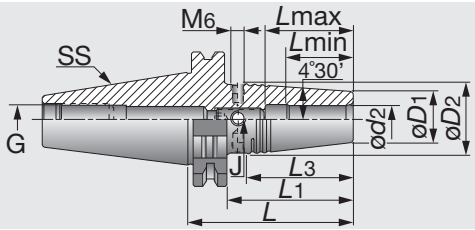


Pull stud F118
Induction heating unit F113
Heating unit F113
Preset screws F124

# TUNGSHRINK

## DIN69871-SRKIN (Shrink holder)

TungShrink thermal shrinking holder for carbide and HSS with DIN69871 shank




| Designation | SS | ød2 | øD1 | øD2 | L | L1 | L3 | Lmin | Lmax | J | G | key |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DIN6987140SRKIN6X80 | 40 | 6 | 21 | 27 | 80 | 60.9 | 38 | 25 | 36 | M5 | M16 | 2.5 |
| DIN6987140SRKIN8X80 | 40 | 8 | 21 | 27 | 80 | 60.9 | 38 | 25 | 36 | M6 | M16 | 3 |
| DIN6987140SRKIN10X80 | 40 | 10 | 24 | 32 | 80 | 60.9 | 50.5 | 31 | 42 | M8 | M16 | 4 |
| DIN6987140SRKIN12X80 | 40 | 12 | 24 | 32 | 80 | 60.9 | 50.5 | 31 | 47 | M10 | M16 | 5 |
| DIN6987140SRKIN14X80 | 40 | 14 | 27 | 34 | 80 | 60.9 | 44.2 | 36 | 47 | M10 | M16 | 5 |
| DIN6987140SRKIN16X80 | 40 | 16 | 27 | 34 | 80 | 60.9 | 44.2 | 39 | 50 | M12 | M16 | 6 |
| DIN6987140SRKIN18X80 | 40 | 18 | 33 | 42 | 80 | 60.9 | 57 | 39 | 50 | M12 | M16 | 6 |
| DIN6987140SRKIN20X80 | 40 | 20 | 33 | 42 | 80 | 60.9 | 57 | 41 | 52 | M16 | M16 | 8 |
| DIN6987140SRKIN25X100 | 40 | 25 | 44 | 53 | 100 | 80.9 | 57 | 47 | 58 | M16 | M16 | 8 |
| DIN6987150SRKIN6X80 (1) | 50 | 6 | 21 | 27 | 80 | 60.9 | 38 | 25 | 36 | M5 | M24 | 2.5 |
| DIN6987150SRKIN8X80 (1) | 50 | 8 | 21 | 27 | 80 | 60.9 | 38 | 25 | 36 | M6 | M24 | 3 |
| DIN6987150SRKIN10X80 (1) | 50 | 10 | 24 | 32 | 80 | 60.9 | 51 | 31 | 42 | M8 | M24 | 4 |
| DIN6987150SRKIN12X80 (1) | 50 | 12 | 24 | 32 | 80 | 60.9 | 51 | 36 | 47 | M10 | M24 | 5 |
| DIN6987150SRKIN14X80 (1) | 50 | 14 | 27 | 34 | 80 | 60.9 | 44.5 | 36 | 47 | M10 | M24 | 5 |
| DIN6987150SRKIN16X80 (1) | 50 | 16 | 27 | 34 | 80 | 60.9 | 44.5 | 39 | 50 | M12 | M24 | 6 |
| DIN6987150SRKIN18X80 (1) | 50 | 18 | 33 | 42 | 80 | 60.9 | 57 | 39 | 50 | M12 | M24 | 6 |
| DIN6987150SRKIN20X80 (1) | 50 | 20 | 33 | 42 | 80 | 60.9 | 57 | 41 | 52 | M16 | M24 | 8 |
| DIN6987150SRKIN25X100 (1) | 50 | 25 | 44 | 53 | 100 | 80.9 | 57 | 47 | 58 | M16 | M24 | 8 |
| DIN6987150SRKIN32X100 (1) | 50 | 32 | 44 | 53 | 100 | 80.9 | 57 | 47 | 58 | M16 | M24 | 8 |

• Use only inductive heating device for SRKIN holders. (1) Balanced to G2.5 20,000 $min^{-1}$

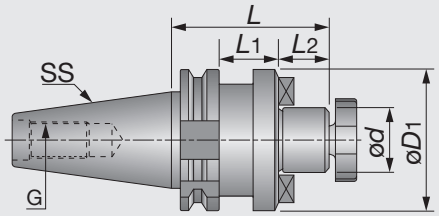
Tooling System


Pull stud F118
Induction heating unit F113
Heating unit F113
Preset screws F124

TUNGHOLD

## DIN69871-SEM (Shell mill holder)

Shell mill holder with DIN69871 shank



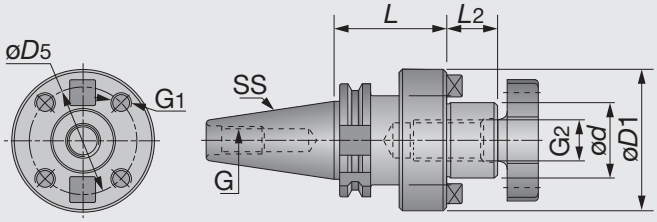

| Designation | SS | ød | L2 | øD1 | L | L1 | G |
|---|---|---|---|---|---|---|---|
| DIN6987130SEM16X35 | 30 | 16 | 17 | 38 | 35 | 15.9 | M12 |
| DIN6987130SEM22X50 | 30 | 22 | 19 | 47 | 50 | 30.9 | M12 |
| DIN6987130SEM27X50 | 30 | 27 | 21 | 58 | 50 | 30.9 | M12 |
| DIN6987140SEM16X35 | 40 | 16 | 17 | 38 | 35 | 15.9 | M16 |
| DIN6987140SEM22X35 | 40 | 22 | 19 | 47 | 35 | 15.9 | M16 |
| DIN6987140SEM27X60 | 40 | 27 | 21 | 58 | 60 | 40.9 | M16 |
| DIN6987140SEM32X60 | 40 | 32 | 24 | 66 | 60 | 40.9 | M16 |
| DIN6987140SEM40X60 | 40 | 40 | 27 | 82 | 60 | 40.9 | M16 |
| DIN6987150SEM16X35 | 50 | 16 | 17 | 38 | 35 | 15.9 | M24 |
| DIN6987150SEM22X35 | 50 | 22 | 19 | 47 | 35 | 15.9 | M24 |
| DIN6987150SEM22X50X200 | 50 | 22 | 19 | 50 | 200 | 180.9 | M24 |
| DIN6987150SEM27X35 | 50 | 27 | 21 | 58 | 35 | 15.9 | M24 |
| DIN6987150SEM32X35 | 50 | 32 | 24 | 66 | 35 | 15.9 | M24 |
| DIN6987150SEM32X78X370 | 50 | 32 | 24 | 78 | 370 | 350.9 | M24 |
| DIN6987150SEM40X50 | 50 | 40 | 27 | 82 | 50 | 30.9 | M24 |
| DIN6987150SEM50X60 | 50 | 50 | 30 | 95 | 60 | 40.9 | M24 |

• (Option:Wrench for lock screw)

TUNGHOLD

## DIN69871-FM (Face mill holder)

Face mill holder with DIN69871 shank




| Designation | SS | ød | L2 | øD1 | L | G2 | øD5 | G1 | G |
|---|---|---|---|---|---|---|---|---|---|
| DIN6987140FM40 | 40 | 40 | 27 | 88 | 60 | M20 | 66.7 | M12 | M16 |
| DIN6987150FM40 | 50 | 40 | 27 | 88 | 70 | M20 | 66.7 | M12 | M24 |
| DIN6987150FM60 | 50 | 60 | 40 | 128 | 70 | - | 101.6 | M16 | M24 |

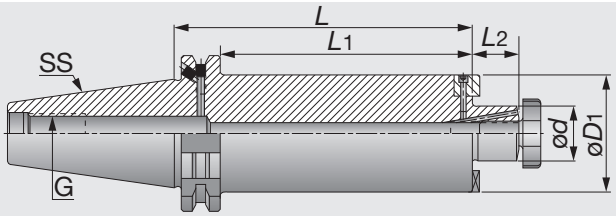


Pull stud F118
Clamping screw F123
Wrench F125

TUNGHOLD

## DIN69871-SEM (Shell mill holder with extra long)

Extra long type shell mill holder with coolant hole with DIN69871 shank



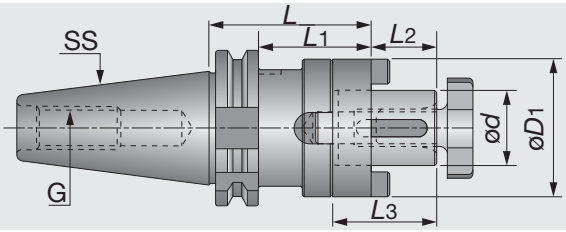

| Designation | SS | ød | L2 | øD1 | L | L1 | G |
|---|---|---|---|---|---|---|---|
| DIN6987150SEM22X48X200C | 50 | 22 | 19 | 48 | 200 | 181 | M24 |
| DIN6987150SEM22X61X300C | 50 | 22 | 19 | 61 | 300 | 281 | M24 |
| DIN6987150SEM27X61X300C | 50 | 27 | 21 | 61 | 300 | 281 | M24 |
| DIN6987150SEM32X78X370C | 50 | 32 | 24 | 78 | 370 | 351 | M24 |

• If the "B type" option is required, the plug screw must the removed from the flange cooling hole. (use a 2 mm hex key.) (Option:Wrench for lock screw)

TUNGHOLD

## DIN69871-SEMC (Combination holder for slot mill & shell mill)

Combination holder with DIN69871 shank




| Designation | SS | ød | L2 | øD1 | L | L1 | L3 | G |
|---|---|---|---|---|---|---|---|---|
| DIN6987130SEMC16X50 | 30 | 16 | 17 | 32 | 50 | 30.9 | 27 | M12 |
| DIN6987130SEMC22X50 | 30 | 22 | 19 | 40 | 50 | 30.9 | 31 | M12 |
| DIN6987130SEMC32X60 | 30 | 32 | 24 | 58 | 60 | 40.9 | 38 | M12 |
| DIN6987140SEMC16X55 | 40 | 16 | 17 | 32 | 55 | 35.9 | 27 | M16 |
| DIN6987140SEMC16X100 | 40 | 16 | 17 | 32 | 100 | 80.9 | 27 | M16 |
| DIN6987140SEMC22X55 | 40 | 22 | 19 | 40 | 55 | 35.9 | 31 | M16 |
| DIN6987140SEMC22X100 | 40 | 22 | 19 | 40 | 100 | 80.9 | 31 | M16 |
| DIN6987140SEMC27X55 | 40 | 27 | 21 | 48 | 55 | 35.9 | 33 | M16 |
| DIN6987140SEMC27X100 | 40 | 27 | 21 | 48 | 100 | 80.9 | 33 | M16 |
| DIN6987140SEMC32X60 | 40 | 32 | 24 | 58 | 60 | 45.9 | 38 | M16 |
| DIN6987140SEMC32X100 | 40 | 32 | 24 | 58 | 100 | 80.9 | 38 | M16 |
| DIN6987140SEMC40X60 | 40 | 40 | 27 | 70 | 60 | 40.9 | 41 | M16 |
| DIN6987150SEMC16X55 | 50 | 16 | 17 | 32 | 55 | 35.9 | 27 | M24 |
| DIN6987150SEMC16X100 | 50 | 16 | 17 | 32 | 100 | 80.9 | 27 | M24 |
| DIN6987150SEMC22X55 | 50 | 22 | 19 | 40 | 55 | 35.9 | 31 | M24 |
| DIN6987150SEMC22X100 | 50 | 22 | 19 | 40 | 100 | 80.9 | 31 | M24 |
| DIN6987150SEMC27X55 | 50 | 27 | 21 | 48 | 55 | 35.9 | 33 | M24 |
| DIN6987150SEMC27X100 | 50 | 27 | 21 | 48 | 100 | 80.9 | 33 | M24 |
| DIN6987150SEMC32X55 | 50 | 32 | 24 | 58 | 55 | 35.9 | 38 | M24 |
| DIN6987150SEMC32X100 | 50 | 32 | 24 | 58 | 100 | 80.9 | 38 | M24 |
| DIN6987150SEMC40X55 | 50 | 40 | 27 | 70 | 55 | 35.9 | 41 | M24 |
| DIN6987150SEMC40X100 | 50 | 40 | 27 | 70 | 100 | 80.9 | 41 | M24 |
| DIN6987150SEMC50X70 | 50 | 50 | 30 | 90 | 70 | 50.9 | 46 | M24 |

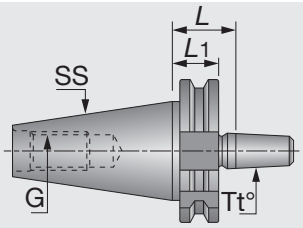
• If the "B type" option is required, the plug screw must the removed from the flange cooling hole. (use a 2 mm hex key.) (Option:Wrench for lock screw)

Tooling System


Pull stud F118
Clamping screw F123
Wrench F125

## DIN69871-DC (Jacobs taper holder)

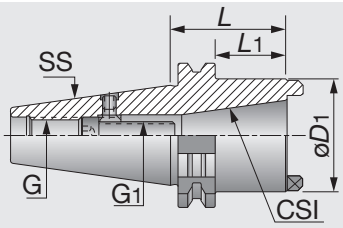
Jacobs taper holder wih DIN69871 shank




| Designation | SS | Tt° | L | L1 | G |
|---|---|---|---|---|---|
| DIN6987130DCB12X26 | 30 | B12 | 26 | 19.1 | M12 |
| DIN6987140DCB12X26 | 40 | B12 | 26 | 19.1 | M16 |
| DIN6987140DCB16X26 | 40 | B16 | 26 | 19.1 | M16 |
| DIN6987140DCB18X26 | 40 | B18 | 26 | 19.1 | M16 |
| DIN6987150DCB12X26 | 50 | B12 | 26 | 19.1 | M24 |
| DIN6987150DCB16X26 | 50 | B16 | 26 | 19.1 | M24 |
| DIN6987150DCB18X26 | 50 | B18 | 26 | 19.1 | M24 |

## DIN69871 AD(Conversion adaptor )

Conversion adaptor for DIN69871 system



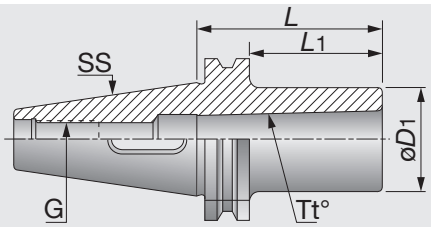

| Designation | SS | CSI | L | øD1 | L1 | G1 | G |
|---|---|---|---|---|---|---|---|
| DIN6987140ADDIN208030 | 40 | DIN2080 30 | 50 | 50 | 30.9 | M12 | M16 |
| DIN6987150ADBT/SK40 | 50 | BT/SK 40 | 70 | 66 | 50.9 | M16 | M24 |



Pull stud
F118

## TUNGHOLD
### DIN69871-MT(Holder for Morse taper)

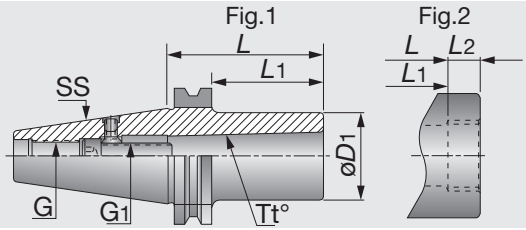
Morse taper holder with DIN69871 shank




| Designation | SS | Tt° | L | øD1 | L1 | G |
|---|---|---|---|---|---|---|
| DIN6987130MT3X75 | 30 | MT3 | 75 | 40 | 55.9 | M12 |
| DIN6987140MT1X50 | 40 | MT1 | 50 | 25 | 30.9 | M16 |
| DIN6987140MT2X50 | 40 | MT2 | 50 | 32 | 30.9 | M16 |
| DIN6987140MT3X70 | 40 | MT3 | 70 | 40 | 50.9 | M16 |
| DIN6987140MT4X95 | 40 | MT4 | 95 | 48 | 75.9 | M16 |
| DIN6987150MT1X45 | 50 | MT1 | 45 | 25 | 25.9 | M24 |
| DIN6987150MT2X60 | 50 | MT2 | 60 | 32 | 40.9 | M24 |
| DIN6987150MT3X65 | 50 | MT3 | 65 | 40 | 45.9 | M24 |
| DIN6987150MT4X95 | 50 | MT4 | 95 | 48 | 75.9 | M24 |
| DIN6987150MT5X105 | 50 | MT5 | 105 | 63 | 85.9 | M24 |

## TUNGHOLD
### DIN69871-MT DRW (Holder for draw bar)

Morse taper holder with draw bar for DIN69871



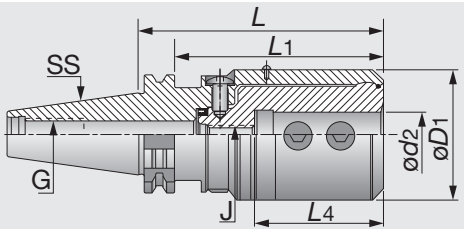

| Designation | SS | Tt° | L | øD1 | L1 | L2 | G1 | G | Fig. |
|---|---|---|---|---|---|---|---|---|---|
| DIN6987140MT1DRW | 40 | MT1 | 50 | 25 | 30.9 | - | M6 | M16 | 1 |
| DIN6987140MT2DRW | 40 | MT2 | 50 | 32 | 30.9 | - | M10 | M16 | 1 |
| DIN6987140MT3DRW | 40 | MT3 | 70 | 40 | 50.9 | - | M12 | M16 | 1 |
| DIN6987140MT4DRW (1) | 40 | MT4 | 95 | 63 | 75.9 | 15 | M16 | M16 | 2 |
| DIN6987150MT1DRW | 50 | MT1 | 45 | 25 | 25.9 | - | M6 | M24 | 1 |
| DIN6987150MT2DRW | 50 | MT2 | 60 | 32 | 40.9 | - | M10 | M24 | 1 |
| DIN6987150MT3DRW | 50 | MT3 | 65 | 40 | 45.9 | - | M12 | M24 | 1 |
| DIN6987150MT4DRW (1) | 50 | MT4 | 70 | 63 | 50.9 | 15 | M16 | M24 | 2 |
| DIN6987150MT5DRW (1) | 50 | MT5 | 100 | 78 | 80.9 | 18 | M20 | M24 | 2 |

(1) DIN 2201.

# TUNGBORE

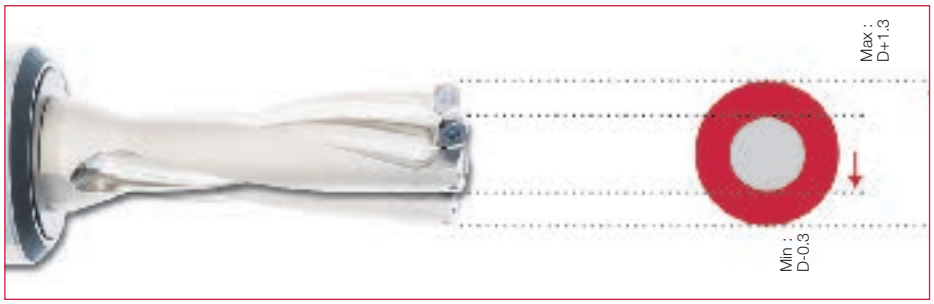
## TUNGBORE-DIN69871 (Adjustable holder for indexable drill)

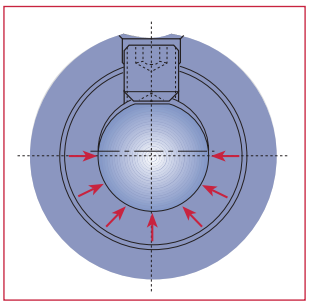
TungBore adjustable drilling dia. holder with DIN69871 shank




| Designation | SS | ød2 | øD1 | L | L1 | L4 | J | G |
|---|---|---|---|---|---|---|---|---|
| TUNGBORE-SKA40EM16ADB | 40 | 16 | 72 | 135.6 | 116.5 | 71 | M10 | M16 |
| TUNGBORE-SKA40EM20ADB | 40 | 20 | 72 | 135.6 | 116.5 | 71 | M10 | M16 |
| TUNGBORE-SKA40EM25ADB | 40 | 25 | 72 | 135.6 | 116.5 | 71 | M10 | M16 |
| TUNGBORE-SKA40EM32ADB | 40 | 32 | 72 | 135.6 | 116.5 | 71 | M10 | M16 |
| TUNGBORE-SKA40EM40ADB | 40 | 40 | 72 | 135.6 | 116.5 | 71 | M10 | M16 |
| TUNGBORE-SKA50EM16ADB | 50 | 16 | 72 | 115.6 | 96.5 | 71 | M10 | M24 |
| TUNGBORE-SKA50EM20ADB | 50 | 20 | 72 | 115.6 | 96.5 | 71 | M10 | M24 |
| TUNGBORE-SKA50EM25ADB | 50 | 25 | 72 | 115.6 | 96.5 | 71 | M10 | M24 |
| TUNGBORE-SKA50EM32ADB | 50 | 32 | 72 | 115.6 | 96.5 | 71 | M10 | M24 |
| TUNGBORE-SKA50EM40ADB | 50 | 40 | 72 | 115.6 | 96.5 | 71 | M10 | M24 |

• The items that include "ADB" in the description are coolant through spindle & flange type.



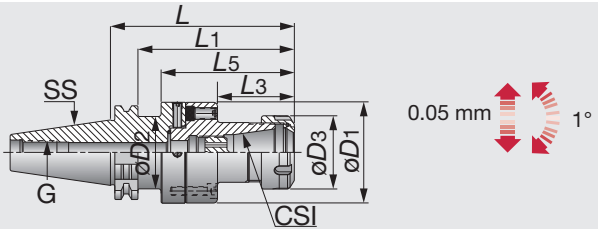
The bore's section is actually made from two shifted circular sections. The clamping screw pushes the drill shank through a narrowed opening, forcing elastic deformation of the holder. Contact is made around more than 180°, providing a high clamping force.

Tooling System

Pull stud
F118

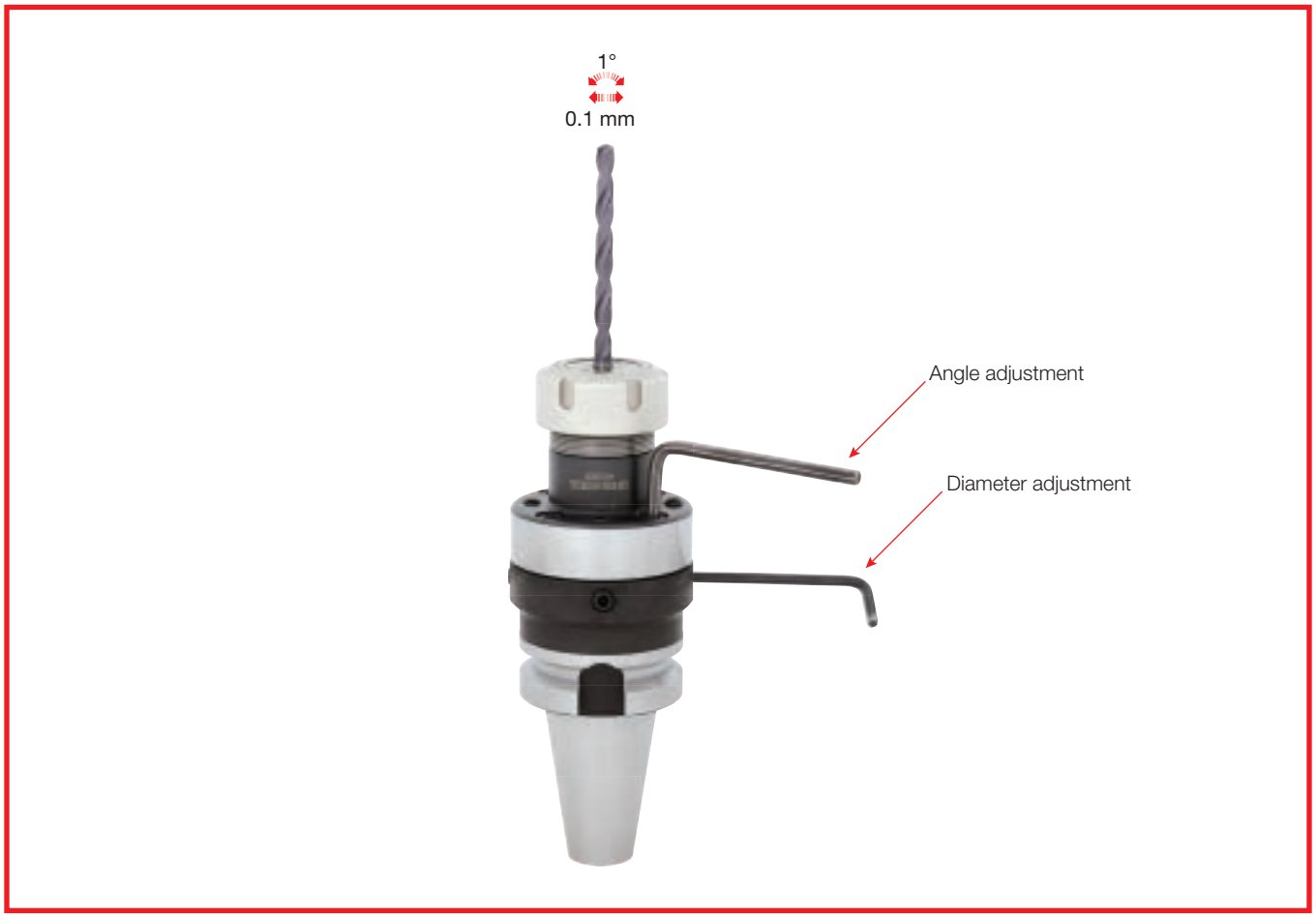
# ADJ DIN69871-ER collet (Collet chuck holder)

ER Collet chucks with center alignment and DIN69871 shanks




| Designation | SS | CSI | Range | *L* | *L*1 | *L*5 | *L*3 | ø*D*3 | ø*D*1 | ø*D*2 | G |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ADJDIN6987140D70ER32 | 40 | ER32 | 2-20 | 124.5 | 105.4 | 89.5 | 52.5 | 50 | 70 | 46 | M16 |
| ADJDIN6987150D70ER32 | 50 | ER32 | 2-20 | 124.5 | 105.4 | - | 52.5 | 50 | 70 | - | M24 |

(Option:Wrench for ER collet)



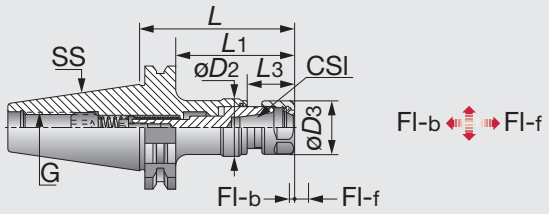

Tooling System

ER Collet F095
Nut F119
Wrench F121
Preset screws F122
Pull stud F118

## TUNGGTI

### GTI-DIN69871-ER tapping (Tapping holder)

TungGTI tapping attachment with DIN69871 shank



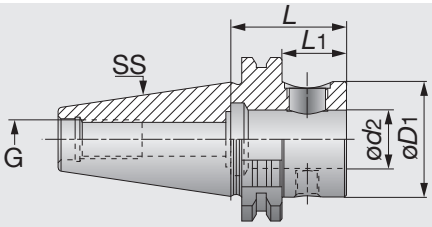

| Designation | SS | CSI | Tap min | Tap max | Range | L | L1 | L3 | øD3 | øD2 | Fl-f | Fl-b | G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GTIDIN6987140ER16 | 40 | ER16 | M3 | M10 | 0.5-10 | 81.2 | 62.1 | 24.6 | 28 | 29.5 | 8 | 3 | M16 |
| GTIDIN6987150ER16 | 50 | ER16 | M3 | M10 | 0.5-10 | 106.8 | 87.7 | 24.6 | 28 | 29.5 | 8 | 3 | M24 |
| GTIDIN6987140ER32 | 40 | ER32 | M6 | M20 | 2-20 | 112.6 | 93.5 | 33 | 50 | 56.5 | 9 | 4 | M16 |
| GTIDIN6987150ER32 | 50 | ER32 | M6 | M20 | 2-20 | 115.3 | 96.2 | 33 | 50 | 56.5 | 9 | 4 | M24 |
| GTIDIN6987140ER40 | 40 | ER40 | M6 | M28 | 3-26 | 130.6 | 111.5 | 51 | 63 | 56.5 | 9 | 4 | M16 |
| GTIDIN6987150ER40 | 50 | ER40 | M6 | M28 | 3-26 | 133.3 | 114.2 | 51 | 63 | 56.5 | 9 | 4 | M24 |

(Option : Wrench for ER-Collet)

## TUNGFIT

### DIN69871-CF (Quick change holder)

TungFit quick change style modular tooling system with DIN69871 shank



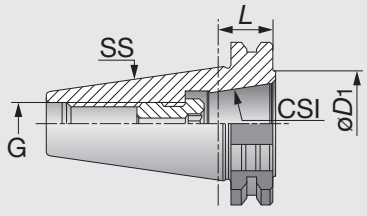

| Designation | SS | ød2 | øD1 | L | L1 | G |
|---|---|---|---|---|---|---|
| DIN6987140CF4-S | 40 | 25 | 44.5 | 44.1 | 25 | M16 |
| DIN6987140CF4-SB | 40 | 25 | 44.5 | 44.1 | 25 | M16 |
| DIN6987140CF4-L | 40 | 25 | 44.5 | 100 | 80.9 | M16 |
| DIN6987150CF4-S | 50 | 25 | 44.5 | 44.1 | 25 | M24 |
| DIN6987150CF4-SB | 50 | 25 | 44.5 | 44.1 | 25 | M24 |
| DIN6987150CF4-L | 50 | 25 | 44.5 | 100 | 80.9 | M24 |
| DIN6987150CF4-LB | 50 | 25 | 44.5 | 100 | 80.9 | M24 |

• Tightening torque: 58.8 N·m. • Add B for coolant through the flange.

## TUNGCLICK

### DIN69871-ER-CLICK (Quick change holder)

TungClick quick change tooling system with DIN69871 shank




| Designation | SS | CSI | øD1 | L | G |
|---|---|---|---|---|---|
| DIN6987140ER32CLICK-IN | 40 | ER32 | 41 | 20.1 | M16 |
| DIN6987150ER32CLICK-IN | 50 | ER32 | 41 | 20.1 | M24 |

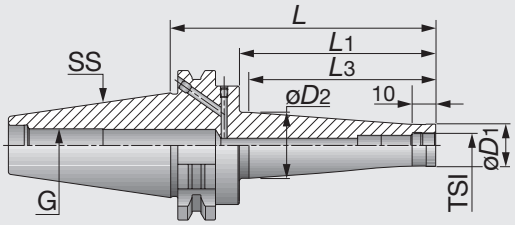
• Tightening torque: 235 N·m



ER Collet F095 | Nut F119 | Wrench F121 | Preset screws F122 | Pull stud F118

# DIN69871-ODP (Screw clamp holder for modular cutting heads)

TungFlex modular tooling system with DIN69871 shank




| Designation | SS | TSI | øD1 | øD2 | L | L1 | L3 | G |
|---|---|---|---|---|---|---|---|---|
| DIN6987140ODP6X58 | 40 | M6 | 9.8 | 13 | 58 | 38.9 | 32 | M16 |
| DIN6987140ODP6X98 | 40 | M6 | 9.8 | 23 | 98 | 78.9 | 74 | M16 |
| DIN6987140ODP8X58 | 40 | M8 | 13.1 | 15 | 58 | 38.9 | 32 | M16 |
| DIN6987140ODP8X98 | 40 | M8 | 13.1 | 23 | 98 | 78.9 | 74 | M16 |
| DIN6987140ODP10X58 | 40 | M10 | 18 | 20 | 58 | 38.9 | 32 | M16 |
| DIN6987140ODP10X98 | 40 | M10 | 18 | 28 | 98 | 78.9 | 74 | M16 |
| DIN6987140ODP12X58 | 40 | M12 | 21 | 24 | 58 | 38.9 | 34 | M16 |
| DIN6987140ODP12X98 | 40 | M12 | 21 | 31 | 98 | 78.9 | 75 | M16 |
| DIN6987140ODP16X58 | 40 | M16 | 29 | 28.6 | 58 | 38.9 | 33 | M16 |
| DIN6987140ODP16X98 | 40 | M16 | 29 | 34 | 98 | 78.9 | 75 | M16 |
| DIN6987150ODP12X78 (1) | 50 | M12 | 23 | 30 | 78 | 58.9 | 50 | M24 |
| DIN6987150ODP12X128 (1) | 50 | M12 | 23 | 40 | 128 | 108.9 | 100 | M24 |
| DIN6987150ODP12X178 (1) | 50 | M12 | 23 | 40 | 178 | 158.9 | 150 | M24 |
| DIN6987150ODP12X228 (1) | 50 | M12 | 23 | 46 | 228 | 208.9 | 200 | M24 |
| DIN6987150ODP16X78 (1) | 50 | M16 | 29 | 34 | 78 | 58.9 | 50 | M24 |
| DIN6987150ODP16X128 (1) | 50 | M16 | 29 | 40 | 128 | 108.9 | 100 | M24 |
| DIN6987150ODP16X178 (1) | 50 | M16 | 29 | 55 | 178 | 158.9 | 150 | M24 |
| DIN6987150ODP16X228 (1) | 50 | M16 | 29 | 55 | 228 | 208.9 | 200 | M24 |

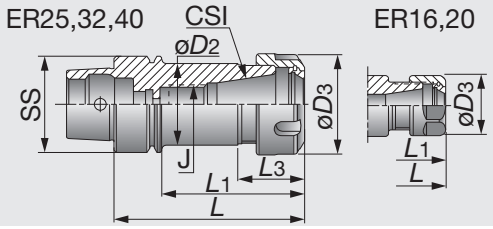
(1) Balanced to G6.3 12,000 $min^{-1}$.



Pull stud
F118

# HSK E-ER (Collet chuck holder)

ER collet chucks with HSK-E shank




| Designation | SS | CSI | Range | *L* | *L*1 | *L*3 | ø*D*3 | ø*D*2 | J |
|---|---|---|---|---|---|---|---|---|---|
| HSKE32ER16X60 | 32 | ER16 | 0.5-10 | 60 | 40 | 21.5 | 28 | 22.4 | - |
| HSKE32ER20X60 | 32 | ER20 | 1-13 | 6 | 40 | 26 | 34 | 25.4 | - |
| HSKE32ER25X65 | 32 | ER25 | 1-16 | 65 | 45 | 30 | 42 | 25.8 | - |
| HSKE40ER16X60 | 40 | ER16 | 0.5-10 | 60 | 40 | - | 28 | - | - |
| HSKE40ER16X80 | 40 | ER16 | 0.5-10 | 80 | 60 | - | 28 | - | M10 |
| HSKE40ER20X80 | 40 | ER20 | 1-13 | 80 | 60 | - | 34 | - | M12 |
| HSKE40ER25X80 | 40 | ER25 | 1-16 | 80 | 60 | 28 | 42 | 34 | M18X1.5 |
| HSKE40ER32X80 | 40 | ER32 | 2-20 | 80 | 60 | 31 | 50 | 40.1 | M22X1.5 |
| HSKE50ER16X100 (1) | 50 | ER16 | 0.5-10 | 100 | 74 | - | 28 | - | M10 |
| HSKE50ER16X100M (1)(3) | 50 | ER16 | 0.5-10 | 100 | 74 | - | 22 | - | M10 |
| HSKE50ER16X80 (1) | 50 | ER16 | 0.5-10 | 80 | 54 | - | 28 | - | M10 |
| HSKE50ER20X80 (1) | 50 | ER20 | 1-13 | 80 | 54 | - | 34 | - | M10 |
| HSKE50ER25X80 (1) | 50 | ER25 | 1-16 | 80 | 54 | 28 | 42 | 32.4 | - |
| HSKE50ER32X80 (1) | 50 | ER32 | 2-20 | 80 | 54 | 31 | 50 | 40.4 | - |
| HSKE50ER32X100 (1) | 50 | ER32 | 2-20 | 100 | 74 | 31 | 50 | 40.4 | M22X1.5 |
| HSKE63ER16X80 (2) | 63 | ER16 | 0.5-10 | 80 | 54 | - | 28 | - | M10 |
| HSKE63ER16X100 (2) | 63 | ER16 | 0.5-10 | 100 | 74 | - | 28 | - | M10 |
| HSKE63ER20X75 (2) | 63 | ER20 | 1-13 | 75 | 49 | - | 34 | - | - |
| HSKE63ER32X80 (2) | 63 | ER32 | 2-20 | 80 | 54 | 31 | 50 | 40.4 | - |
| HSKE63ER32X100 (2) | 63 | ER32 | 2-20 | 100 | 75 | - | 50 | - | M22X1.5 |
| HSKE63ER40X80 (2) | 63 | ER40 | 3-26 | 80 | 54 | 34 | 63 | - | - |

(1) Balanced to G2.5 35,000 min$^{-1}$. (2) Balanced to G2.5 35,000 min$^{-1}$. (3) Balanced to G2.5 30,000 min$^{-1}$.

(Option:Wrench for ER collet)

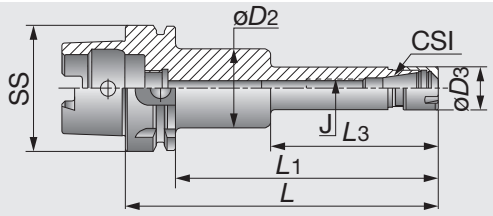
- Equipped with nut ER 16 MINI.

Tooling System

ER Colllet F095
Nut F119
Preset screws F122
Wrench F121, F126
Cooling tube F125

# HSK A-ER M (Mini collet chuck holder)

## ER Mini-collet chucks with HSK-A shank




| Designation | SS | CSI | Range | *L* | $L_1$ | $L_3$ | ø$D_3$ | ø$D_2$ | J |
|---|---|---|---|---|---|---|---|---|---|
| HSKA50ER16X100M | 50 | ER16 | 0.5-10 | 100 | 74 | - | 22 | - | M10 |
| HSKA50ER16X120M | 50 | ER16 | 0.5-10 | 120 | 94 | - | 22 | - | M10 |
| HSKA50ER20X100M | 50 | ER20 | 1-13 | 100 | 74 | - | 28 | - | M12 |
| HSKA50ER20X120M | 50 | ER20 | 1-13 | 120 | 94 | - | 28 | - | M12 |
| HSKA63ER16X100M | 63 | ER16 | 0.5-10 | 100 | 74 | - | 22 | - | M10 |
| HSKA63ER16X120M | 63 | ER16 | 0.5-10 | 120 | 94 | 78 | 22 | 40 | M10 |
| HSKA63ER16X160M | 63 | ER16 | 0.5-10 | 160 | 134 | 85 | 22 | 40 | M10 |
| HSKA63ER20X100M | 63 | ER20 | 1-13 | 100 | 74 | - | 28 | - | M12 |
| HSKA63ER20X120M | 63 | ER20 | 1-13 | 120 | 94 | - | 28 | - | M12 |
| HSKA63ER20X160M | 63 | ER20 | 1-13 | 160 | 134 | 85 | 28 | 45 | M12 |
| HSKA100ER16X100M (1) | 100 | ER16 | 0.5-10 | 100 | 71 | - | 22 | - | M10 |
| HSKA100ER16X160M (1) | 100 | ER16 | 0.5-10 | 160 | 131 | 85 | 22 | 40 | M10 |
| HSKA100ER20X100M (1) | 100 | ER20 | 1-13 | 100 | 71 | - | 28 | - | M12 |
| HSKA100ER20X160M (1) | 100 | ER20 | 1-13 | 160 | 131 | 85 | 28 | 45 | M12 |

(1) Balance to G6.3 12,000 $min^{-1}$.

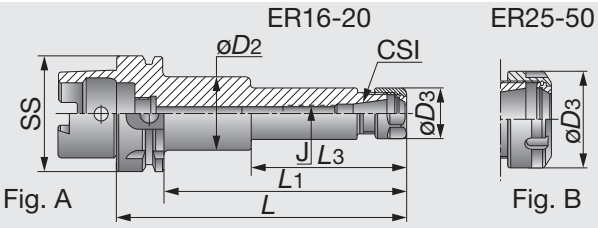
(Option:Wrench for ER collet)

Tooling System

ER Colllet F095 | Nut F119 | Preset screws F122 | Wrench F121, F126 | Cooling tube F125

# HSK A-ER (Collet chuck holder)

ER collet chucks with HSK-A shank




| Designation | SS | CSI | Range | *L* | *L*1 | *L*3 | ø*D*3 | ø*D*2 | J | Fig. |
|---|---|---|---|---|---|---|---|---|---|---|
| HSKA40ER16X60 | 40 | ER16 | 0.5-10 | 60 | 40 | - | 28 | - | M10 | A |
| HSKA40ER16X80 | 40 | ER16 | 0.5-10 | 80 | 60 | - | 28 | - | M10 | A |
| HSKA40ER16X100 | 40 | ER16 | 0.5-10 | 100 | 80 | - | 28 | - | M10 | A |
| HSKA50ER16X100 | 50 | ER16 | 0.5-10 | 100 | 74 | - | 28 | - | M10 | A |
| HSKA50ER16X120 | 50 | ER16 | 0.5-10 | 120 | 94 | - | 28 | - | M10 | A |
| HSKA50ER20X100 | 50 | ER20 | 1-13 | 100 | 74 | - | 34 | - | M12 | A |
| HSKA50ER20X120 | 50 | ER20 | 1-13 | 120 | 94 | - | 34 | - | M12 | A |
| HSKA63ER16X100 | 63 | ER16 | 0.5-10 | 100 | 74 | - | 28 | - | M10 | A |
| HSKA63ER16X120 | 63 | ER16 | 0.5-10 | 120 | 94 | - | 28 | - | M10 | A |
| HSKA63ER16X160 | 63 | ER16 | 0.5-10 | 160 | 134 | 85.6 | 28 | 40 | M10 | A |
| HSKA63ER20X100 | 63 | ER20 | 1-13 | 100 | 74 | - | 34 | - | M12 | A |
| HSKA63ER20X120 | 63 | ER20 | 1-13 | 120 | 94 | - | 34 | - | M12 | A |
| HSKA63ER20X160 | 63 | ER20 | 1-13 | 160 | 134 | 85.0 | 34 | 45 | M12 | A |
| HSKA100ER16X100 (1) | 100 | ER16 | 0.5-10 | 100 | 71 | - | 28 | - | M10 | A |
| HSKA100ER16X160 (1) | 100 | ER16 | 0.5-10 | 160 | 131 | 85 | 28 | 40 | M10 | A |
| HSKA100ER20X100 (1) | 100 | ER20 | 1-13 | 100 | 71 | - | 34 | - | M12 | A |
| HSKA100ER20X160 (1) | 100 | ER20 | 1-13 | 160 | 131 | 85 | 34 | 45 | M12 | A |
| HSKA40ER25X80 | 40 | ER25 | 1-16 | 80 | 60 | 28 | 42 | 32.4 | M18x1.5 | B |
| HSKA40ER25X100 | 40 | ER25 | 1-16 | 100 | 80 | 28 | 42 | 32.4 | M16 | B |
| HSKA40ER32X100 | 40 | ER32 | 2-20 | 100 | 80 | 31 | 50 | 40.4 | M22x1.5 | B |
| HSKA50ER25X80 | 50 | ER25 | 1-16 | 80 | 54 | 28 | 42 | 32.4 | M16 | B |
| HSKA50ER25X100 | 50 | ER25 | 1-16 | 100 | 74 | 28.5 | 42 | 41.8 | M16 | B |
| HSKA50ER32X100 | 50 | ER32 | 2-20 | 100 | 74 | 31 | 50 | 40.4 | M22x1.5 | B |
| HSKA50ER32X120 | 50 | ER32 | 2-20 | 120 | 94 | 35 | 50 | 41.8 | M22x1.5 | B |
| HSKA63ER25X80 | 63 | ER25 | 1-16 | 80 | 54 | - | 42 | - | M16 | B |
| HSKA63ER25X100 | 63 | ER25 | 1-16 | 100 | 74 | - | 42 | - | M16 | B |
| HSKA63ER25X120 | 63 | ER25 | 1-16 | 120 | 94 | - | 42 | - | M16 | B |
| HSKA63ER25X160 | 63 | ER25 | 1-16 | 160 | 134 | - | 42 | - | M16 | B |
| HSKA63ER32X80 | 63 | ER32 | 2-20 | 80 | 54 | 31 | 50 | 40.4 | M22x1.5 | B |
| HSKA63ER32X100 | 63 | ER32 | 2-20 | 100 | 74 | - | 50 | - | M22x1.5 | B |
| HSKA63ER32X120 | 63 | ER32 | 2-20 | 120 | 94 | - | 50 | - | M22x1.5 | B |
| HSKA63ER32X140 | 63 | ER32 | 2-20 | 140 | 114 | - | 50 | - | M22x1.5 | B |
| HSKA63ER32X160 | 63 | ER32 | 2-20 | 160 | 134 | - | 50 | - | M22x1.5 | B |
| HSKA63ER40X80 | 63 | ER40 | 3-26 | 80 | 54 | 34 | 63 | 50.4 | - | B |
| HSKA63ER40X100 | 63 | ER40 | 3-26 | 100 | 74 | 34 | 63 | 50.4 | M28x1.5 | B |
| HSKA63ER40X120 | 63 | ER40 | 3-26 | 120 | 94 | 34 | 63 | 50.4 | M28x1.5 | B |
| HSKA100ER25X100 | 100 | ER25 | 1-16 | 100 | 71 | - | 42 | - | M16 | B |
| HSKA100ER25X120 | 100 | ER25 | 1-16 | 120 | 91 | - | 42 | - | M16 | B |
| HSKA100ER25X160 | 100 | ER25 | 1-16 | 160 | 134 | - | 42 | - | M16 | B |
| HSKA100ER32X100 | 100 | ER32 | 2-20 | 100 | 71 | - | 50 | - | M22x1.5 | B |
| HSKA100ER32X120 | 100 | ER32 | 2-20 | 120 | 91 | - | 50 | - | M22x1.5 | B |
| HSKA100ER32X160 | 100 | ER32 | 2-20 | 160 | 131 | - | 50 | - | M22x1.5 | B |
| HSKA100ER40X100 | 100 | ER40 | 3-26 | 100 | 71 | - | 63 | - | M28x1.5 | B |
| HSKA100ER40X120 | 100 | ER40 | 3-26 | 120 | 91 | - | 63 | - | M28x1.5 | B |
| HSKA100ER40X160 | 100 | ER40 | 3-26 | 160 | 131 | - | 63 | - | M28x1.5 | B |
| HSKA100ER50X100 | 100 | ER50 | 10-34 | 100 | 71 | - | 78 | - | - | B |

(1) Balanced to G6.3 12,000 min$^{-1}$.

(Option:Wrench for ER collet)

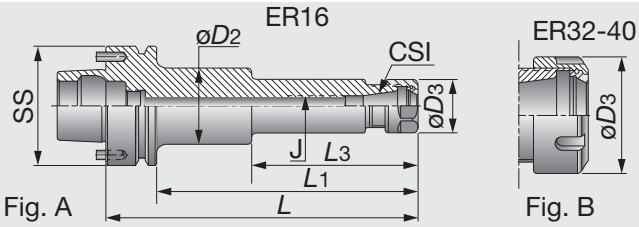
Tooling System

ER Colllet F095 | Nut F119 | Preset screws F122 | Wrench F121, F126 | Cooling tube F125

# TUNGHOLD

## HSK FM-ER (Collet chuck holder)

ER collet chucks with HSK-FM shank




| Designation | SS | CSI | Range | *L* | *L*1 | *L*3 | ø*D*3 | ø*D*2 | J | Fig. |
|---|---|---|---|---|---|---|---|---|---|---|
| HSKFM63ER16X80 | 63 | ER16 | 0.5-10 | 80 | 54 | - | 28 | - | M10 | A |
| HSKFM63ER16X100 | 63 | ER16 | 0.5-10 | 100 | 74 | - | 28 | - | M10 | A |
| HSKFM63ER16X120 | 63 | ER16 | 0.5-10 | 120 | 94 | - | 28 | - | M10 | A |
| HSKFM63ER16X160 | 63 | ER16 | 0.5-10 | 160 | 134 | 85.6 | 28 | 40 | M10 | A |
| HSKFM63ER32X80 | 63 | ER32 | 2-20 | 80 | 54 | - | 50 | - | - | B |
| HSKFM63ER32X100 | 63 | ER32 | 2-20 | 100 | 74 | - | 50 | - | M22x1.5 | B |
| HSKFM63ER40X80 | 63 | ER40 | 3-26 | 80 | 54 | 32 | 63 | 50 | - | B |
| HSKFM63ER40X100 | 63 | ER40 | 3-26 | 100 | 74 | 32 | 63 | 50 | M28x1.5 | B |

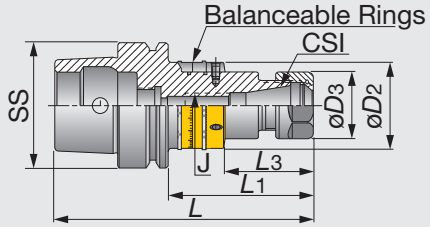
• The driving pins can be removed, turning the toolholder into a standard HSK "F63" type.

(Option:Wrench for ER collet)

# TUNGBALANCE

## HSK E-ER BIN (Collet chuck holder)

TungBalance adjustable dynamic balance collet chuck holder with HSK-E shank




| Designation | SS | CSI | Range | *L* | *L*1 | *L*3 | ø*D*3 | ø*D*2 | J |
|---|---|---|---|---|---|---|---|---|---|
| HSKE63ER16X100BIN | 63 | ER16 | 0.5-10 | 100 | 74 | 45 | 28 | 44 | M10 |
| HSKE63ER20X100BIN | 63 | ER20 | 1-13 | 100 | 74 | 45.1 | 34 | 44 | M12 |
| HSKE63ER25X100BIN | 63 | ER25 | 1-16 | 100 | 74 | 45.2 | 42 | 44 | M16 |
| HSKE63ER32X120BIN | 63 | ER32 | 2-20 | 120 | 94 | 48 | 50 | 60 | M22x1.5 |

• Balanced to G2.5 20,000 $min^{-1}$.

(Option:Wrench for ER collet

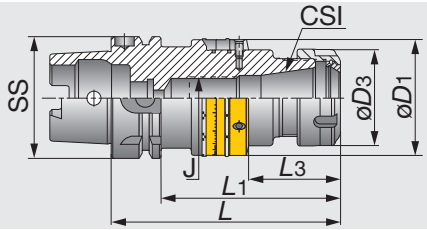
Tooling System


ER Colllet F095 | Nut F119 | Preset screws F122 | Wrench F121, F126 | Cooling tube F125

# TUNGBALANCE

## HSK A-ER BIN (Collet chuck holder)

TungBalance adjustable dynamic balance collet chuck holder with HSK-A shank




| Designation | SS | CSI | Range | *L* | *L*1 | *L*3 | ø*D*3 | ø*D*1 | J |
|---|---|---|---|---|---|---|---|---|---|
| HSKA63ER16X100BIN | 63 | ER16 | 0.5-10 | 100 | 74 | 45 | 28 | 44 | M10 |
| HSKA63ER16X160BIN | 63 | ER16 | 0.5-10 | 160 | 134 | 75 | 28 | 44 | M10 |
| HSKA63ER20X100BIN | 63 | ER20 | 1-13 | 100 | 74 | 45.1 | 34 | 44 | M12 |
| HSKA63ER20X160BIN | 63 | ER20 | 1-13 | 160 | 134 | 86.1 | 34 | 44 | M12 |
| HSKA63ER25X100BIN | 63 | ER25 | 1-16 | 100 | 74 | 45.2 | 42 | 44 | M16 |
| HSKA63ER25X160BIN | 63 | ER25 | 1-16 | 160 | 134 | 86.2 | 42 | 44 | M16 |
| HSKA63ER32X120BIN | 63 | ER32 | 2-20 | 120 | 94 | 48 | 50 | 60 | M22x1.5 |
| HSKA63ER32X160BIN | 63 | ER32 | 2-20 | 160 | 134 | 85 | 50 | 60 | M22x1.5 |

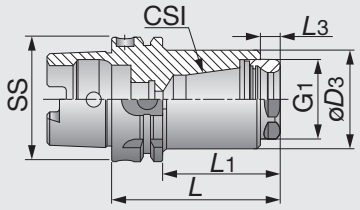
• Balanced to G2.5 20,000 min$^{-1}$.

(Option:Wrench for ER collet)

# TUNGSHORT

## HSK A-SHORT (Collet chuck holder for short overhang)

TungShort collet chucks with HSK-A shank




| Designation | SS | CSI | Range | *L* | *L*1 | *L*3 | ø*D*3 | G1 |
|---|---|---|---|---|---|---|---|---|
| HSKA63ER32SHORT | 63 | ER32 | 2-20 | 84.5 | 56.1 | 9.5 | 50 | M40x1.5 |
| HSKA100ER32SHORT | 100 | ER32 | 2-20 | 89.5 | 60.5 | 9.5 | 50 | M40x1.5 |
| HSKA100ER40SHORT | 100 | ER40 | 3-26 | 104.5 | 75.5 | 9.5 | 70 | M50x1.5 |

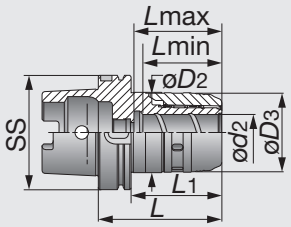
• Balanced to G6.3 8,000 min$^{-1}$.

(Option:Wrench for ER collet)

# TUNGMAX

## HSK A-TUNGMAX (Power chuck holder)

TungMax endmill chuck holders with HSK-A shank




| Designation | SS | ø*d*2 | Range | *L* | *L*1 | *L*min | *L*max | ø*D*3 | ø*D*2 |
|---|---|---|---|---|---|---|---|---|---|
| HSKA63MAXIN20X95 | 63 | 20 | 6-20 | 95 | 69 | 56 | 66 | 51 | 53 |
| HSKA63MAXIN32X113 | 63 | 32 | 6-32 | 113 | 87 | 70 | 85 | 69 | 70 |
| HSKA100MAXIN20X115 (1) | 100 | 20 | 6-20 | 115 | 86 | 56 | 69 | 51 | 53 |
| HSKA100MAXIN32X135 (1) | 100 | 32 | 6-32 | 135 | 106 | 71 | 87 | 69 | 70 |

(1) Balanced to G6.3 8,000 min$^{-1}$.

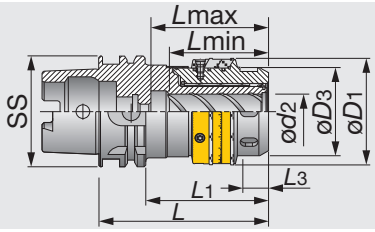
(Option:Wrench for TungMax collet)


ER Colllet F095 | Nut F119 | Preset screws F122 | Wrench F121, F126 | Cooling tube F125 | Straight collet F105

# TUNGBALANCE

## HSK A-TUNGMAX BIN (Power chuck holder)

TungMax adjustable dynamic balancable endmill chuck holders with HSK-A shank




| Designation | SS | ød2 | Range | L | L1 | L3 | Lmin | Lmax | øD3 | øD1 |
|---|---|---|---|---|---|---|---|---|---|---|
| HSKA63MAXIN20X95BIN (1) | 63 | 20 | 6-20 | 95 | 69 | 17.5 | 56 | 66 | 51 | 61 |
| HSKA63MAXIN32X113BIN (1) | 63 | 32 | 6-32 | 113 | 87 | 24.9 | 70 | 85 | 69 | 80 |
| HSKA100MAXIN20X115BIN (2) | 100 | 20 | 6-20 | 115 | 86 | 17.5 | 56 | 69 | 51 | 61 |
| HSKA100MAXIN32X110BIN (2) | 100 | 32 | 6-32 | 110 | 81 | 24.9 | 70 | 78 | 69 | 80 |

(1) Chucks with taper size HSK A63 can be balanced by the balancing ring up to G2.5 at 20,000 $min^{-1}$.
(2) Chucks with taper size HSK A100 can be balanced by the balancing ring up to G2.5 at 18,000 $min^{-1}$.

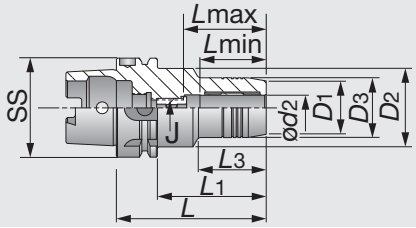
(Option:Wrench for TungMax collet)

Tooling System


Straight collet F105
Cooling tube F125
Wrench F121, F126

# HSK A-HYDRO (Hydro chuck holder)

TungHydro hydraulic endmill chuck holders with HSK-A shank




| Designation | SS | ød2 | øD3 | øD1 | øD2 | L | L1 | L3 | Lmin | Lmax | J |
|---|---|---|---|---|---|---|---|---|---|---|---|
| HSKA50HYDRO6X80 | 50 | 6 | 26 | 23 | 42 | 80 | 54 | 35 | 27 | 37 | M5 |
| HSKA50HYDRO8X80 | 50 | 8 | 28 | 25 | 42 | 80 | 54 | 36 | 27 | 37 | M6 |
| HSKA50HYDRO16X95 | 50 | 16 | 38 | 34 | 42 | 95 | 69 | 52 | 42 | 52 | M12x1 |
| HSKA50HYDRO20X100 | 50 | 20 | 42 | 38 | 42 | 100 | 74 | 74 | 42 | 52 | M16x1 |
| HSKA63HYDRO6X80 | 63 | 6 | 26 | 23 | 50 | 80 | 54 | 33 | 27 | 37 | M5 |
| HSKA63HYDRO8X80 | 63 | 8 | 28 | 25 | 50 | 80 | 54 | 33 | 27 | 37 | M6 |
| HSKA63HYDRO10X85 | 63 | 10 | 30 | 27 | 50 | 85 | 59 | 39 | 32 | 42 | M8x1 |
| HSKA63HYDRO12X90 | 63 | 12 | 32 | 29 | 50 | 90 | 64 | 44 | 37 | 47 | M10x1 |
| HSKA63HYDRO14X90 | 63 | 14 | 34 | 30 | 50 | 90 | 64 | 46 | 37 | 47 | M10x1 |
| HSKA63HYDRO16X95 | 63 | 16 | 38 | 34 | 50 | 95 | 69 | 52 | 42 | 52 | M12x1 |
| HSKA63HYDRO18X95 | 63 | 18 | 40 | 36 | 50 | 95 | 69 | 52 | 42 | 52 | M12x1 |
| HSKA63HYDRO20X100 | 63 | 20 | 42 | 38 | 50 | 100 | 74 | 58 | 42 | 52 | M16x1 |
| HSKA63HYDRO25X120 | 63 | 25 | 50 | 46 | 50 | 120 | 94 | 94 | 48 | 58 | M16x1 |
| HSKA63HYDRO32X125 | 63 | 32 | 60 | 56 | 50 | 125 | 99 | 83 | 52 | 62 | M16x1 |
| HSKA80HYDRO6X85 | 80 | 6 | 26 | 23 | 50 | 85 | 59 | 37 | 27 | 37 | M5 |
| HSKA80HYDRO10X90 | 80 | 10 | 30 | 27 | 50 | 90 | 64 | 42 | 32 | 42 | M8x1 |
| HSKA80HYDRO14X95 | 80 | 14 | 34 | 30 | 50 | 95 | 69 | 47 | 37 | 47 | M10x1 |
| HSKA80HYDRO16X100 | 80 | 16 | 38 | 34 | 50 | 100 | 74 | 52 | 42 | 52 | M12x1 |
| HSKA80HYDRO18X100 | 80 | 18 | 40 | 36 | 50 | 100 | 74 | 52 | 42 | 52 | M12x1 |
| HSKA80HYDRO20X105 | 80 | 20 | 42 | 38 | 50 | 105 | 79 | 52 | 42 | 52 | M16x1 |
| HSKA80HYDRO25X115 | 80 | 25 | 50 | 46 | 50 | 115 | 89 | 58 | 48 | 58 | M16x1 |
| HSKA100HYDRO6X85 | 100 | 6 | 26 | 23 | 63 | 85 | 56 | 29 | 27 | 37 | M5 |
| HSKA100HYDRO8X85 | 100 | 8 | 28 | 25 | 63 | 85 | 56 | 29 | 27 | 37 | M6 |
| HSKA100HYDRO10X90 | 100 | 10 | 30 | 27 | 63 | 90 | 61 | 35 | 32 | 42 | M8x1 |
| HSKA100HYDRO12X95 | 100 | 12 | 32 | 29 | 63 | 95 | 66 | 40 | 37 | 47 | M10x1 |
| HSKA100HYDRO14X95 | 100 | 14 | 34 | 30 | 63 | 95 | 66 | 42 | 37 | 47 | M10x1 |
| HSKA100HYDRO16X100 | 100 | 16 | 38 | 34 | 63 | 100 | 71 | 47 | 42 | 52 | M12x1 |
| HSKA100HYDRO18X100 | 100 | 18 | 40 | 36 | 63 | 100 | 71 | 48 | 42 | 52 | M12x1 |
| HSKA100HYDRO20X105 | 100 | 20 | 42 | 38 | 63 | 105 | 76 | 54 | 42 | 52 | M16x1 |
| HSKA100HYDRO25X115 | 100 | 25 | 50 | 46 | 63 | 115 | 86 | 51 | 48 | 58 | M16x1 |
| HSKA100HYDRO32X120 | 100 | 32 | 60 | 56 | 63 | 120 | 91 | 59 | 52 | 62 | M16x1 |

- Clamping Wrench (wrench HYDRO HEX 4) should be ordered separately.
- Note: Available are reduction sleeves for 12, 20, 25 and 32 mm bore diameters.
- Chucking forces will significantly reduce if reduction sleeves are used (ordered separately).

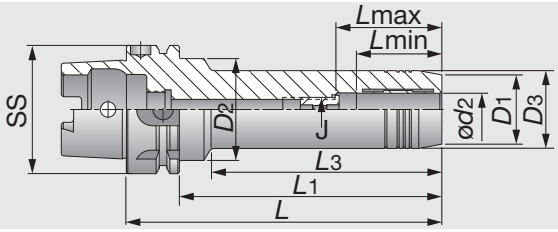


Straight collet F107
Cooling tube F125
Wrench F121, F126

# TUNGHYDRO

## HSK A-HYDRO (Hydro chuck holder for long overhang)

TungHydro long projection hydraulic endmill chuck holders with HSK-A shank




| Designation | SS | ød2 | øD3 | øD1 | øD2 | L | L1 | L3 | Lmin | Lmax | J |
|---|---|---|---|---|---|---|---|---|---|---|---|
| HSKA63HYDRO6X150 | 63 | 6 | 26 | 23 | 50 | 150 | 124 | 103 | 27 | 37 | M5 |
| HSKA63HYDRO6X200 | 63 | 6 | 26 | 23 | 50 | 200 | 174 | 153 | 27 | 37 | M5 |
| HSKA63HYDRO8X150 | 63 | 8 | 28 | 25 | 50 | 150 | 124 | 104 | 27 | 37 | M6 |
| HSKA63HYDRO10X150 | 63 | 10 | 30 | 27 | 50 | 150 | 124 | 104 | 32 | 42 | M8x1 |
| HSKA63HYDRO10X200 | 63 | 10 | 30 | 27 | 50 | 200 | 174 | 154 | 32 | 42 | M8x1 |
| HSKA63HYDRO12X150 | 63 | 12 | 32 | 29 | 50 | 150 | 124 | 105 | 37 | 47 | M10x1 |
| HSKA63HYDRO12X200 | 63 | 12 | 32 | 29 | 50 | 200 | 174 | 155 | 37 | 47 | M10x1 |
| HSKA63HYDRO14X150 | 63 | 14 | 34 | 30 | 50 | 150 | 124 | 105 | 37 | 47 | M10x1 |
| HSKA63HYDRO16X150 | 63 | 16 | 38 | 34 | 50 | 150 | 124 | 106.5 | 42 | 52 | M12x1 |
| HSKA63HYDRO16X200 | 63 | 16 | 38 | 34 | 50 | 200 | 174 | 156.5 | 42 | 52 | M12x1 |
| HSKA63HYDRO20X150 | 63 | 20 | 42 | 38 | 50 | 150 | 124 | 108 | 42 | 52 | M12x1 |
| HSKA63HYDRO20X200 | 63 | 20 | 42 | 38 | 50 | 200 | 174 | 158 | 42 | 52 | M12x1 |
| HSKA63HYDRO25X150 | 63 | 25 | 50 | 46 | 50 | 150 | 124 | - | 48 | 58 | M16x1 |
| HSKA63HYDRO25X200 | 63 | 25 | 50 | 46 | 50 | 200 | 174 | - | 48 | 58 | M16x1 |
| HSKA100HYDRO6X150 | 100 | 6 | 26 | 23 | 50 | 150 | 124 | 94 | 27 | 37 | M6 |
| HSKA100HYDRO6X200 | 100 | 6 | 26 | 23 | 50 | 200 | 174 | 144 | 27 | 37 | M6 |
| HSKA100HYDRO8X150 | 100 | 8 | 28 | 25 | 50 | 150 | 124 | 94.5 | 27 | 37 | M6 |
| HSKA100HYDRO8X200 | 100 | 8 | 28 | 25 | 50 | 200 | 174 | 144.5 | 27 | 37 | M6 |
| HSKA100HYDRO10X150 | 100 | 10 | 30 | 27 | 50 | 150 | 124 | 95 | 32 | 42 | M8x1 |
| HSKA100HYDRO10X200 | 100 | 10 | 30 | 27 | 50 | 200 | 174 | 145 | 32 | 42 | M8x1 |
| HSKA100HYDRO12X150 | 100 | 12 | 32 | 29 | 50 | 150 | 124 | 95.5 | 37 | 47 | M10x1 |
| HSKA100HYDRO12X200 | 100 | 12 | 32 | 29 | 50 | 200 | 174 | 145.5 | 37 | 47 | M10x1 |
| HSKA100HYDRO14X150 | 100 | 14 | 34 | 30 | 50 | 150 | 124 | 97 | 37 | 47 | M10x1 |
| HSKA100HYDRO14X200 | 100 | 14 | 34 | 30 | 50 | 200 | 174 | 147 | 37 | 47 | M10x1 |
| HSKA100HYDRO16X150 | 100 | 16 | 38 | 34 | 50 | 150 | 124 | 97.5 | 42 | 52 | M12x1 |
| HSKA100HYDRO16X200 | 100 | 16 | 38 | 34 | 50 | 200 | 174 | 147.5 | 42 | 52 | M12x1 |
| HSKA100HYDRO18X150 | 100 | 18 | 40 | 36 | 50 | 150 | 124 | 98 | 42 | 52 | M12x1 |
| HSKA100HYDRO18X200 | 100 | 18 | 40 | 36 | 50 | 200 | 174 | 148 | 42 | 52 | M12x1 |
| HSKA100HYDRO20X150 | 100 | 20 | 42 | 38 | 50 | 150 | 124 | 99 | 42 | 52 | M12x1 |
| HSKA100HYDRO20X200 | 100 | 20 | 42 | 38 | 50 | 200 | 174 | 149 | 42 | 52 | M12x1 |
| HSKA100HYDRO25X200 | 100 | 25 | 50 | 46 | 50 | 200 | 174 | - | 48 | 58 | M16x1 |
| HSKA100HYDRO32X200 | 100 | 32 | 60 | 56 | 60 | 200 | 174 | - | 52 | 62 | M16x1 |

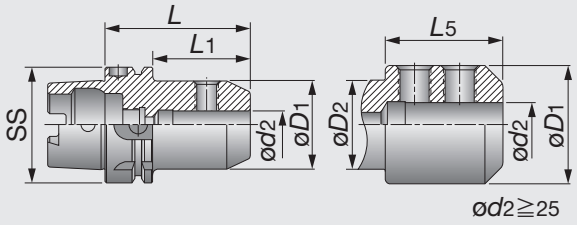
- Clamping Wrench (wrench HYDRO HEX 4) should be ordered separately.
- Note: Available are reduction sleeves for 12, 20, 25 and 32 mm bore diameters.
- Chucking forces will significantly reduce if reduction sleeves are used (ordered separately).



Straight collet F107
Cooling tube F125
Wrench F121, F126

# HSK A-EM (Endmill holder)

Screw locking endmill holders with HSK-A shank




| Designation | SS | ød2 | øD1 | øD2 | L | L1 | L5 |
|---|---|---|---|---|---|---|---|
| HSKA50EM6X65 | 50 | 6 | 25 | - | 65 | 39 | - |
| HSKA50EM8X65 | 50 | 8 | 28 | - | 65 | 39 | - |
| HSKA50EM10X65 | 50 | 10 | 35 | - | 65 | 39 | - |
| HSKA50EM14X80 | 50 | 14 | 44 | 41.8 | 80 | 54 | 38 |
| HSKA50EM16X80 | 50 | 16 | 48 | 41.8 | 80 | 54 | 38 |
| HSKA50EM18X80 | 50 | 18 | 50 | 41.8 | 80 | 54 | 38 |
| HSKA50EM20X80 | 50 | 20 | 52 | 41.8 | 80 | 54 | 38 |
| HSKA63EM6X65 | 63 | 6 | 25 | - | 65 | 39 | - |
| HSKA63EM8X65 | 63 | 8 | 28 | - | 65 | 39 | - |
| HSKA63EM10X65 | 63 | 10 | 35 | - | 65 | 39 | - |
| HSKA63EM12X80 | 63 | 12 | 42 | - | 80 | 54 | - |
| HSKA63EM14X80 | 63 | 14 | 44 | - | 80 | 54 | - |
| HSKA63EM16X80 | 63 | 16 | 48 | - | 80 | 54 | - |
| HSKA63EM18X80 | 63 | 18 | 50 | - | 80 | 54 | - |
| HSKA63EM20X80 | 63 | 20 | 52 | - | 80 | 54 | - |
| HSKA63EM25X110 | 63 | 25 | 65 | 52 | 110 | 84 | 65.5 |
| HSKA63EM32X110 | 63 | 32 | 72 | 52 | 110 | 84 | 65.5 |
| HSKA100EM6X80 | 100 | 6 | 25 | - | 80 | 51 | - |
| HSKA100EM8X80 | 100 | 8 | 28 | - | 80 | 51 | - |
| HSKA100EM10X80 | 100 | 10 | 35 | - | 80 | 51 | - |
| HSKA100EM12X80 | 100 | 12 | 42 | - | 80 | 51 | - |
| HSKA100EM14X80 | 100 | 14 | 44 | - | 80 | 51 | - |
| HSKA100EM16X100 | 100 | 16 | 48 | - | 100 | 71 | - |
| HSKA100EM18X100 | 100 | 18 | 50 | - | 100 | 71 | - |
| HSKA100EM20X100 | 100 | 20 | 52 | - | 100 | 71 | - |
| HSKA100EM25X100 | 100 | 25 | 65 | - | 100 | 71 | - |
| HSKA100EM32X100 | 100 | 32 | 72 | - | 100 | 71 | - |

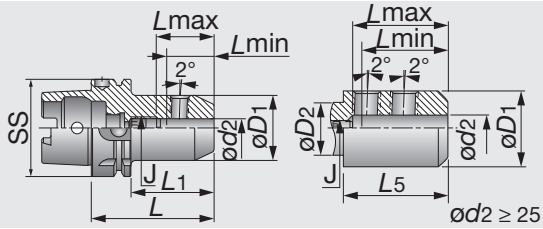


Wrench F126
Cooling tube F125

TUNGHOLD

## HSK A-EM E (Endmill holder with whistle notch)

Screw locking endmill holders for whistle notch with HSK-A shank




| Designation | SS | ød2 | øD1 | øD2 | L | L1 | L5 | Lmin | Lmax | J | key |
|---|---|---|---|---|---|---|---|---|---|---|---|
| HSKA50EM6X80E | 50 | 6 | 25 | - | 80 | 54 | - | 30 | 38 | M5 | 2.5 |
| HSKA50EM8X80E | 50 | 8 | 28 | - | 80 | 54 | - | 35 | 40 | M6 | 3 |
| HSKA50EM10X80E | 50 | 10 | 35 | - | 80 | 54 | - | 39 | 44 | M8 | 4 |
| HSKA50EM12X90E | 50 | 12 | 42 | 41.8 | 90 | 64 | 48 | 44 | 49 | M10 | 5 |
| HSKA50EM14X90E | 50 | 14 | 44 | 41.8 | 90 | 64 | 48 | 44 | 49 | M10 | 5 |
| HSKA50EM16X90E | 50 | 16 | 48 | 41.8 | 90 | 64 | 48 | 47 | 52 | M12 | 6 |
| HSKA50EM18X90E | 50 | 18 | 50 | 41.8 | 90 | 64 | 48 | 47 | 52 | M12 | 6 |
| HSKA50EM20X100E | 50 | 20 | 52 | 41.8 | 100 | 74 | 58 | 49 | 54 | M16 | 8 |
| HSKA63EM6X80E | 63 | 6 | 25 | - | 80 | 54 | - | 32 | 40 | M5 | 2 |
| HSKA63EM8X80E | 63 | 8 | 28 | - | 80 | 54 | - | 35 | 40 | M6 | 3 |
| HSKA63EM10X80E | 63 | 10 | 35 | - | 80 | 54 | - | 39 | 44 | M8 | 4 |
| HSKA63EM12X90E | 63 | 12 | 42 | - | 90 | 64 | - | 44 | 49 | M10 | 5 |
| HSKA63EM14X90E | 63 | 14 | 44 | - | 90 | 64 | - | 44 | 49 | M10 | 5 |
| HSKA63EM16X100E | 63 | 16 | 48 | - | 100 | 74 | - | 47 | 52 | M12 | 6 |
| HSKA63EM18X100E | 63 | 18 | 50 | - | 100 | 74 | - | 47 | 55 | M12 | 6 |
| HSKA63EM20X100E | 63 | 20 | 52 | - | 100 | 74 | - | 49 | 54 | M16 | 8 |
| HSKA63EM25X110E | 63 | 25 | 65 | 52 | 110 | 84 | 65.5 | 54 | 61 | M16 | 8 |
| HSKA63EM32X110E | 63 | 32 | 72 | 52 | 110 | 84 | 65.5 | 58 | 63 | M20X1.5 | 10 |
| HSKA100EM6X90E | 100 | 6 | 25 | - | 90 | 61 | - | 35 | 40 | M5 | 2.5 |
| HSKA100EM8X90E | 100 | 8 | 28 | - | 90 | 61 | - | 35 | 40 | M6 | 3 |
| HSKA100EM10X90E | 100 | 10 | 35 | - | 90 | 61 | - | 39 | 44 | M8 | 4 |
| HSKA100EM12X100E | 100 | 12 | 42 | - | 100 | 71 | - | 44 | 54 | M10 | 5 |
| HSKA100EM14X100E | 100 | 14 | 44 | - | 100 | 71 | - | 44 | 54 | M10 | 5 |
| HSKA100EM16X100E | 100 | 16 | 48 | - | 100 | 71 | - | 47 | 52 | M12 | 6 |
| HSKA100EM18X100E | 100 | 18 | 50 | - | 100 | 71 | - | 47 | 52 | M12 | 6 |
| HSKA100EM20X110E | 100 | 20 | 52 | - | 110 | 81 | - | 49 | 54 | M16 | 8 |
| HSKA100EM25X120E | 100 | 25 | 65 | - | 120 | 91 | - | 54 | 61 | M20X1.5 | 10 |
| HSKA100EM32X120E | 100 | 32 | 72 | - | 120 | 91 | - | 58 | 63 | M20X1.5 | 10 |

(1) The adjustment screw has an internal coolant hole.

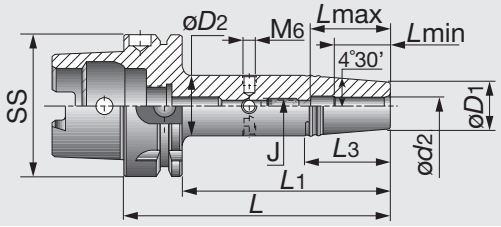
Tooling System

Wrench F126
Cooling tube F125

# TUNGSHRINK

## HSK A-SRKIN (Shrink holder)

TungShrink thermal shrinking holder for carbide and HSS with HSK-A shank




| Designation | SS | ød2 | øD1 | øD2 | L | L1 | L3 | Lmin | Lmax | J | key |
|---|---|---|---|---|---|---|---|---|---|---|---|
| HSKA63SRKIN6X80 | 63 | 6 | 21 | 27 | 80 | 54 | 38 | 25 | 36 | M5 | 2.5 |
| HSKA63SRKIN6X120 | 63 | 6 | 21 | 27 | 120 | 94 | 38 | 25 | 36 | M5 | 2.5 |
| HSKA63SRKIN6X160 | 63 | 6 | 21 | 27 | 160 | 134 | 38 | 25 | 36 | M5 | 2.5 |
| HSKA63SRKIN8X80 | 63 | 8 | 21 | 27 | 80 | 54 | 38 | 25 | 36 | M6 | 3 |
| HSKA63SRKIN8X120 | 63 | 8 | 21 | 27 | 120 | 94 | 38 | 25 | 36 | M6 | 3 |
| HSKA63SRKIN8X160 | 63 | 8 | 21 | 27 | 160 | 134 | 38 | 25 | 36 | M6 | 3 |
| HSKA63SRKIN10X85 | 63 | 10 | 24 | 32 | 85 | 59 | 51 | 31 | 42 | M8 | 4 |
| HSKA63SRKIN10X120 | 63 | 10 | 24 | 32 | 120 | 94 | 51 | 31 | 42 | M8 | 4 |
| HSKA63SRKIN10X160 | 63 | 10 | 24 | 32 | 160 | 134 | 51 | 31 | 42 | M8 | 4 |
| HSKA63SRKIN12X90 | 63 | 12 | 24 | 32 | 90 | 64 | 51 | 36 | 42 | M8 | 4 |
| HSKA63SRKIN12X120 | 63 | 12 | 24 | 32 | 120 | 94 | 51 | 36 | 47 | M10 | 5 |
| HSKA63SRKIN12X160 | 63 | 12 | 24 | 32 | 160 | 134 | 51 | 36 | 47 | M10 | 5 |
| HSKA63SRKIN14X90 | 63 | 14 | 27 | 34 | 90 | 64 | 45 | 36 | 47 | M10 | 5 |
| HSKA63SRKIN14X120 | 63 | 14 | 27 | 34 | 120 | 94 | 45 | 36 | 47 | M10 | 5 |
| HSKA63SRKIN14X160 | 63 | 14 | 27 | 34 | 160 | 134 | 45 | 36 | 47 | M10 | 5 |
| HSKA63SRKIN16X75 | 63 | 16 | 27 | 34 | 75 | 49 | - | 39 | 50 | - | - |
| HSKA63SRKIN16X95 | 63 | 16 | 27 | 34 | 95 | 69 | 44 | 39 | 50 | M12 | 6 |
| HSKA63SRKIN16X120 | 63 | 16 | 27 | 34 | 120 | 94 | 44 | 39 | 50 | M12 | 6 |
| HSKA63SRKIN16X160 | 63 | 16 | 27 | 34 | 160 | 134 | 44 | 39 | 50 | M12 | 6 |
| HSKA63SRKIN18X95 | 63 | 18 | 33 | 42 | 95 | 69 | 57 | 39 | 50 | M12 | 6 |
| HSKA63SRKIN18X120 | 63 | 18 | 33 | 42 | 120 | 94 | 57 | 39 | 50 | M12 | 6 |
| HSKA63SRKIN18X160 | 63 | 18 | 33 | 42 | 160 | 134 | 57 | 39 | 50 | M12 | 6 |
| HSKA63SRKIN20X75 | 63 | 20 | 33 | 41 | 75 | 49 | - | 41 | 50 | - | - |
| HSKA63SRKIN20X100 | 63 | 20 | 33 | 42 | 100 | 74 | 57 | 41 | 52 | M16 | 8 |
| HSKA63SRKIN20X120 | 63 | 20 | 33 | 42 | 120 | 94 | 57 | 41 | 52 | M16 | 8 |
| HSKA63SRKIN20X160 | 63 | 20 | 33 | 42 | 160 | 134 | 57 | 41 | 52 | M16 | 8 |
| HSKA63SRKIN25X85 | 63 | 25 | 44 | 53 | 85 | 59 | - | 47 | 58 | - | - |
| HSKA63SRKIN25X115 | 63 | 25 | 44 | 53 | 115 | 89 | 55 | 47 | 58 | M16 | 8 |
| HSKA63SRKIN32X85 | 63 | 32 | 44 | 53 | 85 | 59 | - | 47 | 58 | - | - |
| HSKA63SRKIN32X120 | 63 | 32 | 44 | 53 | 120 | 94 | 55 | 47 | 58 | M16 | 8 |
| HSKA100SRKIN6X85 | 100 | 6 | 21 | 27 | 85 | 56 | 38 | 25 | 36 | M5 | 2.5 |
| HSKA100SRKIN6X120 | 100 | 6 | 21 | 27 | 120 | 91 | 38 | 25 | 36 | M5 | 2.5 |
| HSKA100SRKIN6X160 | 100 | 6 | 21 | 27 | 160 | 131 | 38 | 25 | 36 | M6 | 3 |
| HSKA100SRKIN8X85 | 100 | 8 | 21 | 27 | 85 | 56 | 38 | 25 | 36 | M6 | 3 |
| HSKA100SRKIN8X120 | 100 | 8 | 21 | 27 | 120 | 91 | 38 | 25 | 36 | M6 | 3 |
| HSKA100SRKIN8X160 | 100 | 8 | 21 | 27 | 160 | 131 | 38 | 25 | 36 | M6 | 3 |
| HSKA100SRKIN10X90 | 100 | 10 | 24 | 32 | 90 | 61 | 51 | 31 | 42 | M8 | 4 |
| HSKA100SRKIN10X120 | 100 | 10 | 24 | 32 | 120 | 91 | 51 | 31 | 42 | M8 | 4 |
| HSKA100SRKIN10X160 | 100 | 10 | 24 | 32 | 160 | 131 | 51 | 31 | 42 | M8 | 4 |
| HSKA100SRKIN12X95 | 100 | 12 | 24 | 32 | 95 | 66 | 51 | 36 | 47 | M10 | 5 |
| HSKA100SRKIN12X120 | 100 | 12 | 24 | 32 | 120 | 91 | 51 | 36 | 47 | M10 | 5 |
| HSKA100SRKIN12X160 | 100 | 12 | 24 | 32 | 160 | 131 | 51 | 36 | 47 | M10 | 5 |
| HSKA100SRKIN14X95 | 100 | 14 | 27 | 34 | 95 | 66 | 45 | 36 | 47 | M10 | 5 |
| HSKA100SRKIN14X120 | 100 | 14 | 27 | 34 | 120 | 91 | 45 | 36 | 47 | M10 | 5 |
| HSKA100SRKIN14X160 | 100 | 14 | 27 | 34 | 160 | 131 | 45 | 36 | 47 | M10 | 5 |
| HSKA100SRKIN16X100 | 100 | 16 | 27 | 34 | 100 | 71 | 45 | 39 | 50 | M12 | 6 |
| HSKA100SRKIN16X120 | 100 | 16 | 27 | 34 | 120 | 91 | 45 | 39 | 50 | M12 | 6 |
| HSKA100SRKIN16X160 | 100 | 16 | 27 | 34 | 160 | 131 | 45 | 39 | 50 | M12 | 6 |
| HSKA100SRKIN18X100 | 100 | 18 | 33 | 42 | 100 | 71 | 57 | 39 | 50 | M12 | 6 |
| HSKA100SRKIN18X160 | 100 | 18 | 33 | 42 | 160 | 131 | 57 | 39 | 50 | M12 | 6 |
| HSKA100SRKIN20X105 | 100 | 20 | 33 | 42 | 105 | 76 | 57 | 41 | 52 | M16 | 8 |
| HSKA100SRKIN20X160 | 100 | 20 | 33 | 42 | 160 | 131 | 57 | 41 | 52 | M16 | 8 |
| HSKA100SRKIN25X115 | 100 | 25 | 44 | 53 | 115 | 86 | 57 | 47 | 58 | M16 | 8 |
| HSKA100SRKIN32X120 | 100 | 32 | 44 | 53 | 120 | 91 | 57 | 47 | 58 | M16 | 8 |

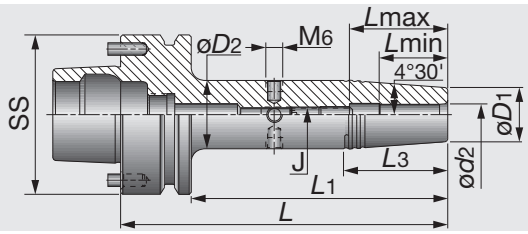
• Use only inductive heating device for SRKIN holders.


Induction heating unit F113
Heating unit F113
Preset screws F124
Wrench F126
Cooling tube F125

# TUNGSHRINK

## HSK FM-SRKIN (Shrink holder)

TungShrink thermal shrinking holder for carbide and HSS with HSK-FM shank




| Designation | SS | ød2 | øD1 | øD2 | L | L1 | L3 | Lmin | Lmax | J | key |
|---|---|---|---|---|---|---|---|---|---|---|---|
| HSKFM63SRKIN6X80 | 63 | 6 | 21 | 27 | 80 | 54 | 38 | 25 | 36 | M5 | 2.5 |
| HSKFM63SRKIN8X80 | 63 | 8 | 21 | 27 | 80 | 54 | 38 | 25 | 36 | M6 | 3 |
| HSKFM63SRKIN10X85 | 63 | 10 | 24 | 32 | 85 | 59 | 50.5 | 31 | 42 | M8 | 4 |
| HSKFM63SRKIN12X90 | 63 | 12 | 24 | 32 | 90 | 64 | 50.5 | 36 | 47 | M10 | 5 |
| HSKFM63SRKIN14X90 | 63 | 14 | 27 | 34 | 90 | 64 | 44.5 | 36 | 47 | M10 | 5 |
| HSKFM63SRKIN16X95 | 63 | 16 | 27 | 34 | 95 | 69 | 44.5 | 39 | 50 | M12 | 6 |
| HSKFM63SRKIN18X95 | 63 | 18 | 33 | 42 | 95 | 69 | 57 | 39 | 50 | M12 | 6 |
| HSKFM63SRKIN20X100 | 63 | 20 | 33 | 42 | 100 | 74 | 57 | 41 | 52 | M16 | 8 |
| HSKFM63SRKIN25X115 | 63 | 25 | 44 | 52.7 | 115 | 89 | 55 | 47 | 58 | M16 | 8 |
| HSKFM63SRKIN32X120 | 63 | 32 | 44 | 52.7 | 120 | 94 | 55 | 47 | 58 | M16 | 8 |

• The driving pins can be removed, turning the toolholder into a standard HSKF63 type. • Use only inductive heating device for SRKIN holders.

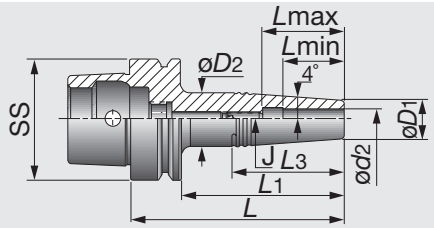


Induction heating unit F113
Heating unit F113
Preset screws F124
Wrench F126
Cooling tube F125

# TUNGSHRINK

## HSK E-SRK (Shrink holder)

TungShrink thermal shrinking holder for carbide shank with HSK-E shank




| Designation | SS | ød2 | øD1 | øD2 | L | L1 | L3 | Lmin | Lmax | J | key |
|---|---|---|---|---|---|---|---|---|---|---|---|
| HSKE32SRK3X45 | 32 | 3 | 10 | 13 | 65 | 45 | 30 | 10 | 16 | M4 | 2 |
| HSKE32SRK4X45 | 32 | 4 | 10 | 15 | 65 | 45 | 35 | 12 | 18 | M4 | 2 |
| HSKE32SRK5X45 | 32 | 5 | 10 | 15 | 65 | 45 | 35 | 15 | 25 | M4 | 2 |
| HSKE32SRK6X45 | 32 | 6 | 11 | 16 | 65 | 45 | 35 | 18 | 28 | M4 | 2 |
| HSKE32SRK8X45 | 32 | 8 | 14 | 20 | 65 | 45 | 42 | 25 | 35 | M4 | 2 |
| HSKE32SRK10X45 | 32 | 10 | 16 | 22 | 65 | 45 | 42 | 30 | 40 | M4 | 2 |
| HSKE32SRK12X45 | 32 | 12 | 20 | 25 | 65 | 45 | 35.6 | 32 | 40 | M4 | 2 |
| HSKE40SRK3X45 | 40 | 3 | 10 | 13 | 65 | 45 | 30 | 10 | 16 | M5 | 2.5 |
| HSKE40SRK3X80 | 40 | 3 | 10 | 19 | 100 | 80 | 64 | 10 | 16 | M5 | 2.5 |
| HSKE40SRK4X45 | 40 | 4 | 10 | 15 | 65 | 45 | 35 | 12 | 18 | M5 | 2.5 |
| HSKE40SRK4X80 | 40 | 4 | 10 | 19 | 100 | 80 | 64 | 12 | 18 | M5 | 2.5 |
| HSKE40SRK5X45 | 40 | 5 | 10 | 15 | 65 | 45 | 35 | 15 | 25 | M4 | 2 |
| HSKE40SRK5X80 | 40 | 5 | 10 | 19 | 100 | 80 | 64 | 15 | 25 | M4 | 2 |
| HSKE40SRK6X45 | 40 | 6 | 11 | 16 | 65 | 45 | 35 | 18 | 28 | M5 | 2.5 |
| HSKE40SRK6X80 | 40 | 6 | 11 | 20 | 100 | 80 | 64 | 18 | 28 | M5 | 2.5 |
| HSKE40SRK8X45 | 40 | 8 | 14 | 20 | 65 | 45 | 42 | 25 | 35 | M5 | 2.5 |
| HSKE40SRK8X80 | 40 | 8 | 14 | 23 | 100 | 80 | 64 | 25 | 35 | M6 | 3 |
| HSKE40SRK10X45 | 40 | 10 | 16 | 22 | 65 | 45 | 42 | 30 | 40 | M5 | 2.5 |
| HSKE40SRK10X80 | 40 | 10 | 16 | 24.5 | 100 | 80 | 60 | 30 | 40 | M8 | 4 |
| HSKE40SRK12X45 | 40 | 12 | 20 | 26 | 65 | 45 | 42 | 32 | 42 | M5 | 2.5 |
| HSKE40SRK12X80 | 40 | 12 | 20 | 28 | 100 | 80 | 56 | 32 | 42 | M10 | 5 |
| HSKE50SRK3X45 (1) | 50 | 3 | 10 | 15 | 71 | 45 | 36 | 10 | 16 | M5 | 2.5 |
| HSKE50SRK3X80 (1) | 50 | 3 | 10 | 19 | 106 | 80 | 64 | 10 | 16 | M5 | 2.5 |
| HSKE50SRK4X45 (1) | 50 | 4 | 10 | 15 | 71 | 45 | 36 | 12 | 18 | M5 | 2.5 |
| HSKE50SRK4X80 (1) | 50 | 4 | 10 | 19 | 106 | 80 | 64 | 12 | 18 | M5 | 2.5 |
| HSKE50SRK5X45 (1) | 50 | 5 | 10 | 15 | 71 | 45 | 36 | 15 | 21 | M6 | 3 |
| HSKE50SRK5X80 | 50 | 5 | 10 | 19 | 106 | 80 | 64 | 15 | 21 | M6 | 3 |
| HSKE50SRK6X45 (1) | 50 | 6 | 11 | 16 | 71 | 45 | 36 | 18 | 28 | M5 | 2.5 |
| HSKE50SRK6X80 (1) | 50 | 6 | 11 | 20 | 106 | 80 | 64 | 18 | 28 | M5 | 2.5 |
| HSKE50SRK8X45 (1) | 50 | 8 | 14 | 20 | 71 | 45 | 43 | 25 | 35 | M6 | 3 |
| HSKE50SRK8X80 (1) | 50 | 8 | 14 | 23 | 106 | 80 | 64 | 25 | 35 | M6 | 3 |
| HSKE50SRK10X45 (1) | 50 | 10 | 16 | 22 | 71 | 45 | 42 | 30 | 37 | M6 | 3 |
| HSKE50SRK10X80 (1) | 50 | 10 | 16 | 24.5 | 106 | 80 | 60 | 30 | 40 | M8 | 4 |
| HSKE50SRK12X45 (1) | 50 | 12 | 20 | 26 | 71 | 45 | 42 | 32 | 39 | M6 | 3 |
| HSKE50SRK12X80 (1) | 50 | 12 | 20 | 28 | 106 | 80 | 57 | 32 | 42 | M10 | 5 |
| HSKE63SRK3X50 | 63 | 3 | 10 | 17 | 76 | 50 | 48 | 10 | 16 | M6 | 3 |
| HSKE63SRK3X80 | 63 | 3 | 10 | 19 | 106 | 80 | 64 | 10 | 16 | M6 | 3 |
| HSKE63SRK4X50 | 63 | 4 | 10 | 17 | 76 | 50 | 48 | 12 | 18 | M6 | 3 |
| HSKE63SRK4X80 | 63 | 4 | 10 | 19 | 106 | 80 | 64 | 12 | 18 | M6 | 3 |
| HSKE63SRK5X45 | 63 | 5 | 10 | 15 | 71 | 45 | 36 | 15 | 21 | M6 | 3 |
| HSKE63SRK5X80 | 63 | 5 | 10 | 19 | 106 | 80 | 64 | 15 | 21 | M6 | 3 |
| HSKE63SRK6X50 | 63 | 6 | 11 | 18 | 76 | 50 | 48 | 18 | 24 | M8 | 4 |
| HSKE63SRK6X80 | 63 | 6 | 11 | 20 | 106 | 80 | 64 | 18 | 24 | M8 | 4 |
| HSKE63SRK8X50 | 63 | 8 | 14 | 21 | 76 | 50 | 48 | 25 | 35 | M6 | 3 |
| HSKE63SRK8X80 | 63 | 8 | 14 | 23 | 106 | 80 | 64 | 25 | 35 | M6 | 3 |
| HSKE63SRK10X50 | 63 | 10 | 16 | 23 | 76 | 50 | 48 | 30 | 40 | M8 | 4 |
| HSKE63SRK10X80 | 63 | 10 | 16 | 24.5 | 106 | 80 | 60 | 30 | 40 | M8 | 4 |
| HSKE63SRK12X50 | 63 | 12 | 20 | 27 | 76 | 50 | 48 | 32 | 42 | M8 | 4 |
| HSKE63SRK12X80 | 63 | 12 | 20 | 28 | 106 | 80 | 57 | 32 | 42 | M10 | 5 |
| HSKE63SRK12X90 | 63 | 12 | 20 | 28 | 116 | 90 | 57 | 32 | 43 | M10 | 5 |

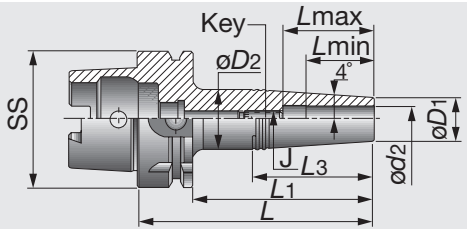
(1) Balanced to G2.5 35,000 min$^{-1}$.


Induction heating unit F113
Heating unit F113
Preset screws F124
Wrench F126
Cooling tube F125

# TUNGSHRINK

## HSK A-SRK (Shrink holder)

TungShrink thermal shrinking holder for carbide shank with HSK-A shank

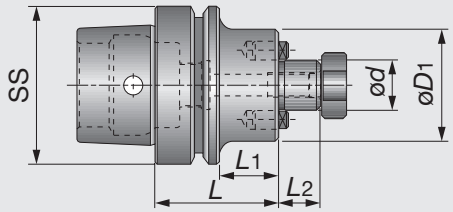



| Designation | SS | ød2 | øD1 | øD2 | L | L1 | L3 | Lmin | Lmax | J | key |
|---|---|---|---|---|---|---|---|---|---|---|---|
| HSKA63SRK3X50 | 63 | 3 | 10 | 17 | 76 | 50 | - | 10 | 16 | M6 | 3 |
| HSKA63SRK3X85 | 63 | 3 | 10 | 21 | 111 | 85 | 79 | 10 | 16 | M6 | 3 |
| HSKA63SRK4X50 | 63 | 4 | 10 | 17 | 76 | 50 | - | 12 | 18 | M6 | 3 |
| HSKA63SRK4X85 | 63 | 4 | 10 | 21 | 111 | 85 | 79 | 12 | 18 | M6 | 3 |
| HSKA63SRK5X50 | 63 | 5 | 10 | 17 | 76 | 50 | - | 15 | 21 | M6 | 3 |
| HSKA63SRK5X85 | 63 | 5 | 10 | 21 | 111 | 85 | 79 | 15 | 21 | M6 | 3 |
| HSKA63SRK6X50 | 63 | 6 | 11 | 18 | 76 | 50 | - | 18 | 24 | M8 | 4 |
| HSKA63SRK6X85 | 63 | 6 | 11 | 22 | 111 | 85 | 79 | 18 | 24 | M8 | 4 |
| HSKA63SRK8X50 | 63 | 8 | 14 | 20 | 76 | 50 | 43 | 25 | 36 | M6 | 3 |
| HSKA63SRK8X85 | 63 | 8 | 14 | 23 | 111 | 85 | 64 | 25 | 36 | M6 | 3 |
| HSKA63SRK10X50 | 63 | 10 | 16 | 23 | 76 | 50 | - | 30 | 41 | M8 | 4 |
| HSKA63SRK10X85 | 63 | 10 | 16 | 26 | 111 | 85 | 72 | 30 | 41 | M8 | 4 |
| HSKA63SRK12X50 | 63 | 12 | 20 | 27 | 76 | 50 | - | 32 | 43 | M8 | 4 |
| HSKA63SRK12X85 | 63 | 12 | 20 | 30 | 111 | 85 | 72 | 32 | 43 | M8 | 4 |

# TUNGHOLD

## HSK E-SEM (Shell mill holder)

Shell mill holder with HSK-E shank




| Designation | SS | ød | L2 | øD1 | L | L1 |
|---|---|---|---|---|---|---|
| HSKE40SEM16X50 | 40 | 16 | 17 | 38 | 50 | 30 |
| HSKE40SEM22X50 | 40 | 22 | 19 | 47 | 50 | 30 |
| HSKE50SEM22X60 | 50 | 22 | 19 | 47 | 60 | 34 |
| HSKE63SEM16X50 | 63 | 16 | 17 | 38 | 50 | 24 |
| HSKE63SEM22X50 | 63 | 22 | 19 | 47 | 50 | 24 |
| HSKE32SEM3/4X2 | 32 | 19.05 | 17 | 44.5 | 50.8 | 30.8 |
| HSKE40SEM3/4X2.000 | 40 | 19.05 | 17 | 45 | 50.8 | 30.8 |
| HSKE50SEM3/4X2.375 | 50 | 19.05 | 17 | 45 | 60.3 | 34.3 |
| HSKE63SEM3/4X2.375 | 63 | 19.05 | 17 | 45 | 60.3 | 34.3 |
| HSKE63SEM1X2.375 | 63 | 25.4 | 17 | 52.8 | 60.3 | 34.3 |

(Option:Wrench for lock screw)

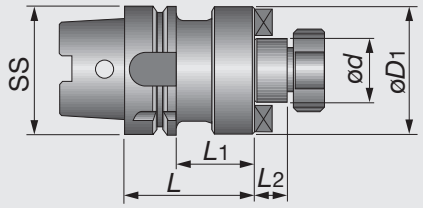


Induction heating unit F113
Heating unit F113
Clamping screw F123
Preset screws F124
Wrench F125, F126
Cooling tube F125

TUNGHOLD

## HSK A-SEM (Shell mill holder)

Shell mill holder with HSK-A shank




| Designation | SS | ød | L2 | øD1 | L | L1 |
|---|---|---|---|---|---|---|
| HSKA40SEM22 | 40 | 22 | 30 | 47 | 50 | 19 |
| HSKA40SEM27 | 40 | 27 | 35 | 58 | 55 | 21 |
| HSKA50SEM16X50 | 50 | 16 | 24 | 50 | 38 | 17 |
| HSKA50SEM22X60 | 50 | 22 | 34 | 60 | 47 | 19 |
| HSKA50SEM27X60 | 50 | 27 | 34 | 60 | 58 | 21 |
| HSKA63SEM16X50 | 63 | 16 | 24 | 50 | 38 | 17 |
| HSKA63SEM22X50 | 63 | 22 | 24 | 50 | 47 | 19 |
| HSKA63SEM27X60 | 63 | 27 | 34 | 60 | 58 | 21 |
| HSKA63SEM32X60 | 63 | 32 | 34 | 60 | 66 | 24 |
| HSKA63SEM40X60 | 63 | 40 | 34 | 60 | 82 | 27 |
| HSKA100SEM22X50 (1) | 100 | 22 | 21 | 50 | 47 | 19 |
| HSKA100SEM27X50 (1) | 100 | 27 | 21 | 50 | 58 | 21 |
| HSKA100SEM32X50 (1) | 100 | 32 | 21 | 50 | 66 | 24 |
| HSKA100SEM40X60 (1) | 100 | 40 | 31 | 60 | 82 | 27 |
| HSKA100SEM50X70 (1) | 100 | 50 | 41 | 70 | 95 | 30 |

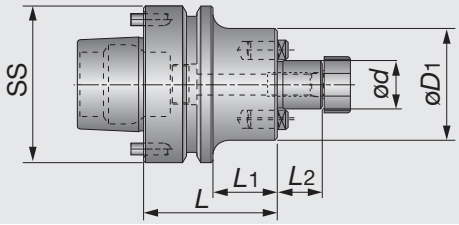
(1) Balanced to G6.3 12,000 min$^{-1}$.

(Option:Wrench for lock screw)

TUNGHOLD

## HSK FM-SEM (Shell mill holder)

Shell mill holder with HSK-FM shank




| Designation | SS | ød | L2 | øD1 | L | L1 |
|---|---|---|---|---|---|---|
| HSKFM63SEM22X60 | 63 | 22 | 19 | 47 | 60 | 34 |
| HSKFM63SEM27X60 | 63 | 27 | 21 | 58 | 60 | 34 |
| HSKFM63SEM32X60 | 63 | 32 | 24 | 66 | 60 | 34 |
| HSKFM63SEM3/4X3.00 | 63 | 19.05 | 17 | 45 | 76.2 | 50.2 |
| HSKFM63SEM3/4X4.50 | 63 | 19.05 | 17 | 45 | 114.3 | 88.3 |
| HSKFM63SEM1X2.375 | 63 | 25.4 | 17 | 52.8 | 60.3 | 34.3 |

• These tools are based on the HSK63F type. • With two drive pins which improve torque transmission.

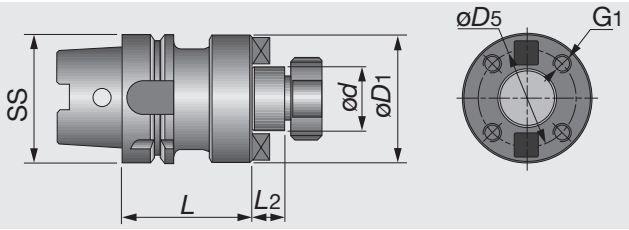
(Option:Wrench for lock screw)



Clamping screw F123
Wrench F125
Wrench F126
Cooling tube F125

## HSK A-FM (Face mill holder)

Face mill holder with HSK-A shank

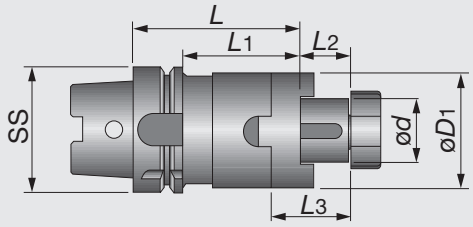



| Designation | SS | ød | L2 | øD1 | L | øD5 | G1 |
|---|---|---|---|---|---|---|---|
| HSKA100FM60X70 | 100 | 60 | 40 | 128 | 70 | 101.6 | M16 |

(Option:Wrench for lock Screw)

## HSK A-SEMC (Combination holder for slot mill & shell mill)

Combination holder with HSK-A shank




| Designation | SS | ød | L2 | øD1 | L | L1 | L3 |
|---|---|---|---|---|---|---|---|
| HSKA50SEMC16X50 | 50 | 16 | 17 | 32 | 50 | 24 | 27 |
| HSKA50SEMC27X65 | 50 | 27 | 21 | 48 | 65 | 39 | 33 |
| HSKA63SEMC16X60 | 63 | 16 | 17 | 32 | 60 | 34 | 21 |
| HSKA63SEMC22X60 | 63 | 22 | 19 | 40 | 60 | 34 | 31 |
| HSKA63SEMC27X60 | 63 | 27 | 21 | 48 | 60 | 34 | 33 |
| HSKA63SEMC32X60 | 63 | 32 | 24 | 58 | 60 | 34 | 38 |
| HSKA63SEMC40X70 | 63 | 40 | 27 | 70 | 70 | 44 | 41 |
| HSKA100SEMC16X60 | 100 | 16 | 17 | 32 | 60 | 31 | 27 |
| HSKA100SEMC22X60 | 100 | 22 | 19 | 40 | 60 | 31 | 31 |
| HSKA100SEMC27X60 | 100 | 27 | 21 | 48 | 60 | 31 | 33 |
| HSKA100SEMC32X60 | 100 | 32 | 24 | 58 | 60 | 31 | 38 |
| HSKA100SEMC40X70 | 100 | 40 | 27 | 70 | 70 | 41 | 41 |
| HSKA100SEMC50X80 | 100 | 50 | 30 | 90 | 80 | 51 | 46 |

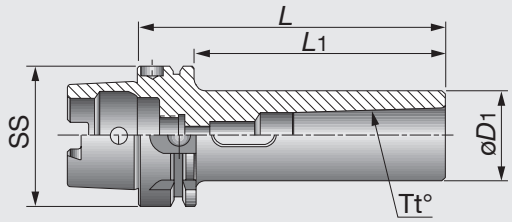
(Option:Wrench for lock Screw)



Clamping screw F123
Wrench F125
Wrench F126
Cooling tube F125

## HSK A-MT (Holder for morse taper)

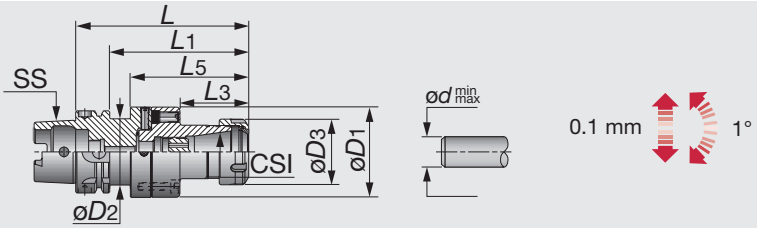
Morse taper holder with HSK-A shank




| Designation | SS | Tt° | L | øD1 | L1 |
|---|---|---|---|---|---|
| HSKA50MT1X100 | 50 | MT1 | 100 | 25 | 74 |
| HSKA50MT2X120 | 50 | MT2 | 120 | 32 | 94 |
| HSKA50MT3X140 | 50 | MT3 | 140 | 40 | 114 |
| HSKA63MT1X110 | 63 | MT1 | 110 | 25 | 84 |
| HSKA63MT2X120 | 63 | MT2 | 120 | 32 | 94 |
| HSKA63MT3X140 | 63 | MT3 | 140 | 40 | 114 |
| HSKA63MT4X160 | 63 | MT4 | 160 | 48 | 134 |
| HSKA100MT1X110 | 100 | MT1 | 110 | 25 | 81 |
| HSKA100MT2X120 | 100 | MT2 | 120 | 32 | 91 |
| HSKA100MT3X150 | 100 | MT3 | 150 | 40 | 121 |
| HSKA100MT4X170 | 100 | MT4 | 170 | 48 | 141 |
| HSKA100MT5X200 | 100 | MT5 | 200 | 63 | 171 |

## ADJ HSK A-ER (Collet chuck holder)

ER Collet Chucks with Center Alignment for HSK-A Shanks




| Designation | SS | CSI | Range | L | L1 | L5 | L3 | øD3 | øD1 | øD2 |
|---|---|---|---|---|---|---|---|---|---|---|
| ADJHSKA63D70ER32 | 63 | ER32 | 2-20 | 134.5 | 108.5 | 82.5 | 52.5 | 50 | 70 | 46 |
| ADJHSKA100D70ER32 | 100 | ER32 | 2-20 | 129.5 | 108.5 | - | 52.5 | 50 | 70 | - |

(Option:Wrench for ER Collet)

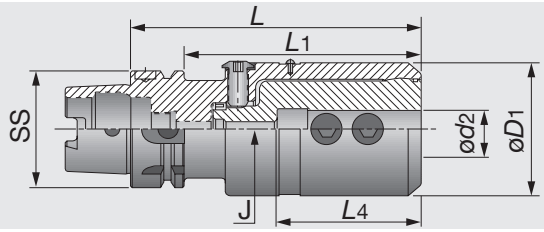
Tooling System

ER Collet F095 | Nut F119 | Preset screws F122 | Wrench F121, F126 | Cooling tube F125

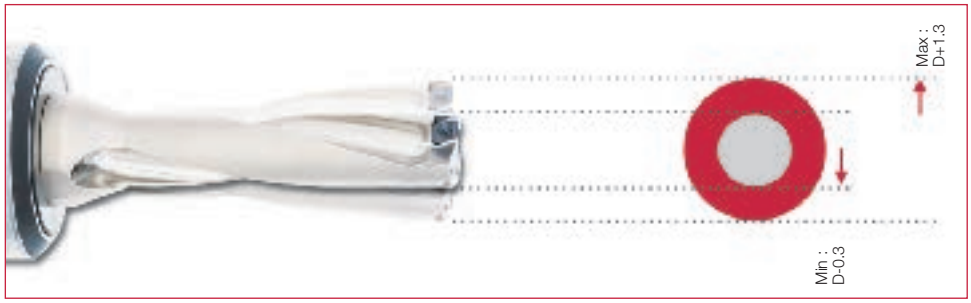
# TUNGBORE

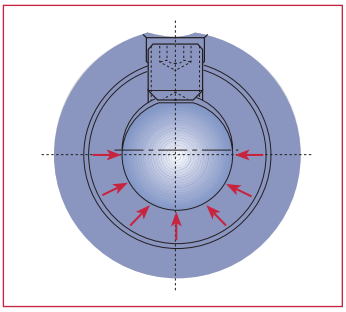
## TUNGBORE-HSK A (Adjustable holder for indexable drill)

TungBore adjustable drilling dia. holder with HSK-A shank




| Designation | SS | ød2 | øD1 | L | L1 | L4 | J |
|---|---|---|---|---|---|---|---|
| TUNGBOREHSKA63EM25 | 63 | 25 | 72 | 142 | 116 | 71 | M10 |
| TUNGBOREHSKA63EM32 | 63 | 32 | 72 | 142 | 116 | 71 | M10 |
| TUNGBOREHSKA63EM40 | 63 | 40 | 72 | 142 | 116 | 71 | M10 |



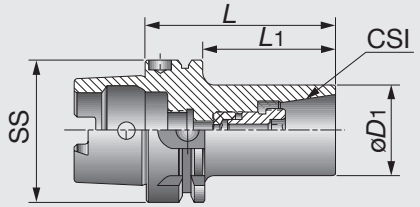



The bore's section is actually made from two shifted circular sections. The clamping screw pushes the drill shank through a narrowed opening, forcing elastic deformation of the holder. Contact is made around more than 180°, providing a high clamping force.

# TUNGCLICK

## HSK A-CLICKIN (Qiuck change holder)

TungClick quick change tooling system with HSK-A shank



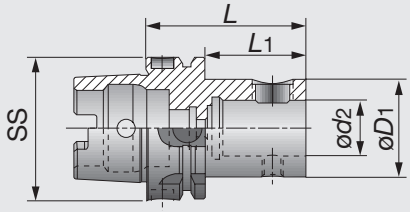

| Designation | SS | CSI | øD1 | L | L1 |
|---|---|---|---|---|---|
| HSKA63ER32CLICK-IN | 63 | 32SRF | 41 | 85 | 59 |
| HSKA100ER32CLICK-IN | 100 | 32SRF | 41 | 90 | 61 |

• Tightening torque: 235 N·m

# TUNGFIT

## HSK A-CF (Qiuck change holder)

TungFit quick change style modular tooling system with HSK-A shank



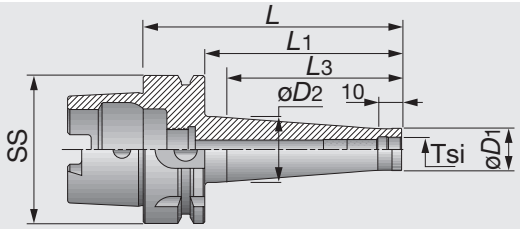

| Designation | SS | ød2 | øD1 | L | L1 |
|---|---|---|---|---|---|
| HSKA63CF4-S | 63 | 25 | 44.5 | 70 | 44 |
| HSKA80CF4-S | 80 | 25 | 44.5 | 73 | 47 |
| HSKA100CF4-S | 100 | 25 | 44.5 | 76 | 47 |

• Tightening torque: 58.8 N·m

Wrench F126
Cooling tube F125

# TUNGFLEX
## HSK A-ODP (Screw clamping head holder)

TungFlex modular tooling system with HSK-A shank

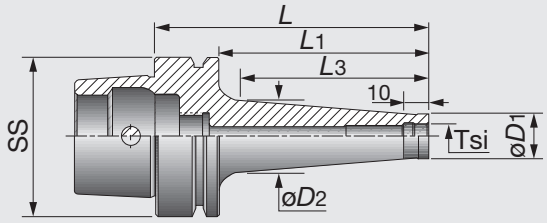



| Designation | SS | Tsi | øD1 | øD2 | L | L1 | L3 |
|---|---|---|---|---|---|---|---|
| HSKA63ODP6X59 | 63 | M6 | 9.7 | 10 | 59 | 33 | 25 |
| HSKA63ODP6X109 | 63 | M6 | 9.8 | 23 | 109 | 83 | 75 |
| HSKA63ODP8X59 | 63 | M8 | 13.1 | 15 | 59 | 33 | 25 |
| HSKA63ODP8X109 | 63 | M8 | 13.1 | 23 | 109 | 83 | 75 |
| HSKA63ODP10X59 | 63 | M10 | 18 | 20 | 59 | 33 | 25 |
| HSKA63ODP10X109 | 63 | M10 | 18 | 28 | 109 | 83 | 75 |
| HSKA63ODP12X59 | 63 | M12 | 21 | 24 | 59 | 33 | 25 |
| HSKA63ODP12X109 | 63 | M12 | 21 | 31 | 109 | 83 | 75 |
| HSKA63ODP16X59 | 63 | M16 | 29 | 34 | 59 | 33 | 25 |
| HSKA63ODP16X109 | 63 | M16 | 29 | 34 | 109 | 83 | 75 |
| HSKA100ODP12X87 (1) | 100 | M12 | 23 | 30 | 87 | 58 | 50 |
| HSKA100ODP12X137 (1) | 100 | M12 | 23 | 30 | 137 | 108 | 100 |
| HSKA100ODP12X187 (1) | 100 | M12 | 23 | 40 | 187 | 158 | 150 |
| HSKA100ODP12X237 (1) | 100 | M12 | 23 | 46 | 237 | 208 | 200 |
| HSKA100ODP16X87 (1) | 100 | M12 | 29 | 31.5 | 87 | 58 | 50 |
| HSKA100ODP16X137 (1) | 100 | M12 | 29. | 41.5 | 137 | 108 | 100 |
| HSKA100ODP16X187 (1) | 100 | M12 | 29 | 55 | 187 | 158 | 150 |
| HSKA100ODP16X237 (1) | 100 | M12 | 29 | 55 | 237 | 208 | 200 |

(1) Balanced to G6.5 12,000 min$^{-1}$.

# TUNGFLEX
## HSK E-ODP (Screw clamping head holder)

TungFlex modular tooling system with HSK-E shank

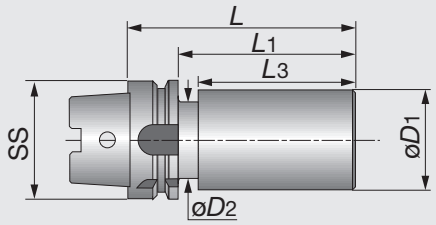



| Designation | SS | Tsi | øD1 | øD2 | L | L1 | L3 |
|---|---|---|---|---|---|---|---|
| HSKE40ODP10X53 | 40 | M10 | 18 | 20 | 53 | 33 | 25 |
| HSKE40ODP10X103 | 40 | M10 | 18 | 28 | 103 | 83 | 75 |
| HSKE40ODP12X53 | 40 | M12 | 21 | 24 | 53 | 33 | 25 |
| HSKE40ODP12X103 | 40 | M12 | 21 | 31 | 103 | 83 | 75 |
| HSKE50ODP10X59 (1) | 50 | M10 | 18 | 20 | 59 | 33 | 25 |
| HSKE50ODP10X109 (1) | 50 | M10 | 18 | 28 | 109 | 83 | 75 |
| HSKE50ODP12X59 (1) | 50 | M12 | 21 | 24 | 59 | 33 | 25 |
| HSKE50ODP12X109 (1) | 50 | M12 | 21 | 31 | 109 | 83 | 75 |
| HSKE50ODP16X59 (1) | 50 | M16 | 29 | 34 | 59 | 33 | 25 |
| HSKE50ODP16X109 (1) | 50 | M16 | 29 | 34 | 109 | 83 | 75 |
| HSKE63ODP10X59 (2) | 63 | M10 | 18 | 20 | 59 | 33 | 25 |
| HSKE63ODP10X109 (2) | 63 | M10 | 18 | 28 | 109 | 83 | 75 |
| HSKE63ODP12X59 (2) | 63 | M12 | 21 | 24 | 59 | 33 | 25 |
| HSKE63ODP12X109 (2) | 63 | M12 | 21 | 31 | 109 | 83 | 75 |
| HSKE63ODP16X109 (2) | 63 | M16 | 29 | 34 | 109 | 83 | 75 |

(1) Balanced to G2.5 35.000 min$^{-1}$. (2) Balanced to G2.5 30.000 min$^{-1}$.

Wrench F126
Cooling tube F125

## Blanks for holders with HSK shank




| Designation | SS | øD1 | øD2 | L | L1 | L3 |
|---|---|---|---|---|---|---|
| HSKA50B16MN100 | 50 | 53 | 41.8 | 100 | 74 | 58 |
| HSKA50B16MN200 | 50 | 53 | 41.8 | 200 | 174 | 158 |
| HSKA63B16MN100 | 63 | 63 | 52.8 | 100 | 74 | 55.5 |
| HSKA63B16MN200 | 63 | 63 | 52.8 | 200 | 174 | 155.5 |
| HSKA100B16MN100 | 100 | 102 | 85 | 100 | 71 | 54.8 |
| HSKA100B16MN200 | 100 | 102 | 85 | 200 | 171 | 154.8 |

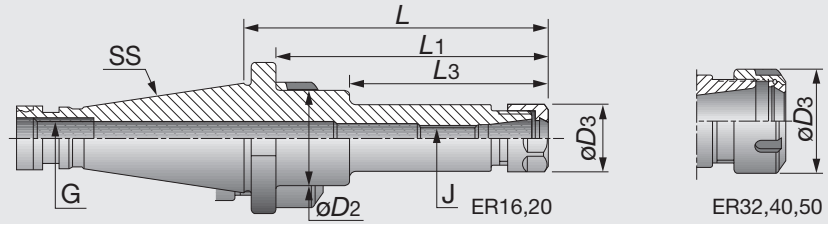
• Material: Case hardened allov steel. • Shank hardness 58 HRc minimum. • Nose hardness 35-37 HRc.



Wrench F126
Cooling tube F126

# DIN2080-ER (Collet chuck holder)

ER collet chucks with DIN2080 shank




| Designation | SS | CSI | Range | *L* | *L*1 | *L*3 | ø*D*3 | ø*D*2 | J | G |
|---|---|---|---|---|---|---|---|---|---|---|
| DIN208030ER16X75 | 30 | ER16 | 0.5-10 | 75 | 65.4 | - | 28 | - | M10 | M12 |
| DIN208030ER32X55 | 30 | ER32 | 2-20 | 55 | 45.4 | - | 50 | - | M18X1.5 | M12 |
| DIN208030ER40X83 | 30 | ER40 | 3-26 | 83 | 69.4 | - | 63 | - | M22X1.5 | M12 |
| DIN208040ER16X63 | 40 | ER16 | 0.5-10 | 63 | 51.4 | - | 28 | - | M12 | M16 |
| DIN208040ER16X100 | 40 | ER16 | 0.5-10 | 100 | 88.4 | - | 28 | - | M12 | M16 |
| DIN208040ER25X50 | 40 | ER25 | 1-16 | 50 | 38.4 | - | 42 | - | M16X1.5 | M16 |
| DIN208040ER32X50 | 40 | ER32 | 2-20 | 50 | 38.4 | - | 50 | - | M22X1.5 | M16 |
| DIN208040ER40X55 | 40 | ER40 | 3-26 | 55 | 43.4 | - | 63 | - | M22X1.5 | M16 |
| DIN208040ER20X63 | 40 | ER20 | 1-13 | 63 | 51.4 | - | 34 | - | M12 | M16 |
| DIN208040ER20X100 | 40 | ER20 | 1-13 | 100 | 88.4 | - | 34 | - | M12 | M16 |
| DIN208050ER16X100 | 50 | ER16 | 0.5-10 | 100 | 84.8 | - | 28 | - | M12 | M24 |
| DIN208050ER16X160 | 50 | ER16 | 0.5-10 | 160 | 144.8 | 95 | 28 | 40 | M12 | M24 |
| DIN208050ER20X100 | 50 | ER20 | 1-13 | 100 | 84.8 | - | 34 | - | M16 | M24 |
| DIN208050ER20X160 | 50 | ER20 | 1-13 | 160 | 144.8 | - | 34 | - | M12 | M24 |
| DIN208050ER40X58 | 50 | ER40 | 3-26 | 58 | 42.8 | - | 63 | - | M28X1.5 | M24 |
| DIN208050ER50X63 | 50 | ER50 | 10-34 | 63 | 47.8 | - | 78 | - | M36X1.5 | M24 |

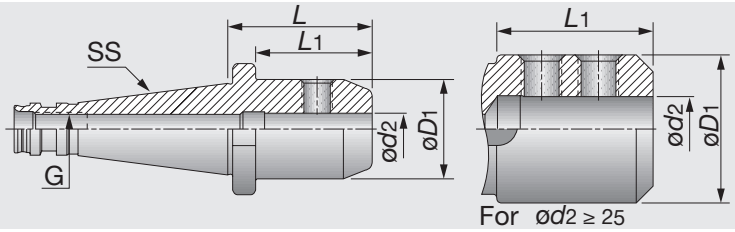
(Option：wrench for ER collet)



ER Colllet F095
Nut F119
Wrench F121
Preset screws F122
Pull stud F118

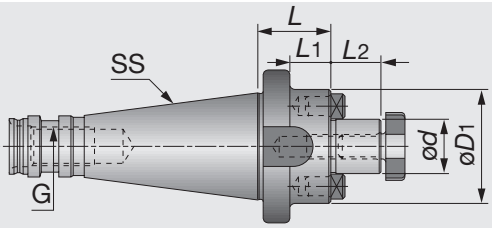
## DIN2080-EM (Endmill holder)

Screw locking endmill holders with DIN2080 shank




| Designation | SS | ød2 | øD1 | L | L1 | G |
|---|---|---|---|---|---|---|
| DIN208030EM6X40 | 30 | 6 | 25 | 40 | 30.4 | M12 |
| DIN208030EM8X40 | 30 | 8 | 28 | 40 | 30.4 | M12 |
| DIN208030EM10X40 | 30 | 10 | 35 | 40 | 30.4 | M12 |
| DIN208030EM20X63 | 30 | 20 | 52 | 63 | 53.4 | M12 |
| DIN208040EM6X50 | 40 | 6 | 25 | 50 | 38.4 | M16 |
| DIN208040EM8X50 | 40 | 8 | 28 | 50 | 38.4 | M16 |
| DIN208040EM10X50 | 40 | 10 | 35 | 50 | 38.4 | M16 |
| DIN208040EM12X50 | 40 | 12 | 42 | 50 | 38.4 | M16 |
| DIN208040EM16X63 | 40 | 16 | 48 | 63 | 51.4 | M16 |
| DIN208040EM20X63 | 40 | 20 | 52 | 63 | 51.4 | M16 |
| DIN208040EM25X80 | 40 | 25 | 65 | 80 | 68.4 | M16 |
| DIN208040EM32X80 | 40 | 32 | 71 | 80 | 68.4 | M16 |
| DIN208050EM6X63 | 50 | 6 | 25 | 63 | 47.8 | M24 |
| DIN208050EM8X63 | 50 | 8 | 28 | 63 | 47.8 | M24 |
| DIN208050EM10X63 | 50 | 10 | 35 | 63 | 47.8 | M24 |
| DIN208050EM12X63 | 50 | 12 | 42 | 63 | 47.8 | M24 |
| DIN208050EM16X63 | 50 | 16 | 48 | 63 | 47.8 | M24 |
| DIN208050EM20X63 | 50 | 20 | 52 | 63 | 47.8 | M24 |
| DIN208050EM25X80 | 50 | 25 | 65 | 80 | 64.8 | M24 |
| DIN208050EM32X80 | 50 | 32 | 72 | 80 | 64.8 | M24 |
| DIN208050EM40X90 | 50 | 40 | 90 | 90 | 74.8 | M24 |
| DIN208050EM50X100 | 50 | 50 | 100 | 100 | 84.8 | M24 |

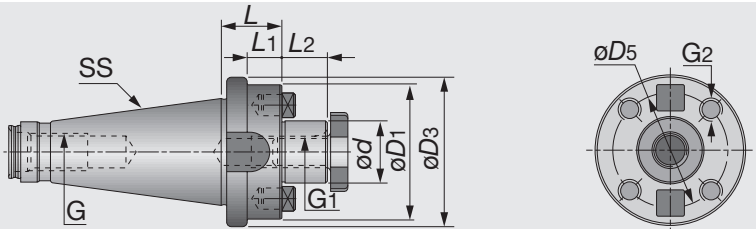
## TUNGHOLD
### DIN2080-SEM (Shell mill holder)
Shell mill holder with DIN2080 shank




| Designation | SS | ød | L2 | øD1 | L | L1 | G |
|---|---|---|---|---|---|---|---|
| DIN208030SEM16X28 | 30 | 16 | 17 | 38 | 28 | 18.4 | M12 |
| DIN208030SEM22X28 | 30 | 22 | 19 | 47 | 28 | 18.4 | M12 |
| DIN208030SEM27X32 | 30 | 27 | 21 | 58 | 32 | 22.4 | M12 |
| DIN208030SEM32X32 | 30 | 32 | 24 | 66 | 32 | 22.4 | M12 |
| DIN208040SEM16X28 | 40 | 16 | 17 | 38 | 28 | 16.4 | M16 |
| DIN208040SEM22X27 | 40 | 22 | 19 | 47 | 27 | 15.4 | M16 |
| DIN208040SEM27X26 | 40 | 27 | 21 | 58 | 26 | 14.4 | M16 |
| DIN208040SEM32X23 | 40 | 32 | 24 | 66 | 23 | 11.4 | M16 |
| DIN208040SEM40X34 | 40 | 40 | 27 | 82 | 34 | 22.4 | M16 |
| DIN208050SEM16X38 | 50 | 16 | 17 | 38 | 38 | 22.8 | M24 |
| DIN208050SEM22X38 | 50 | 22 | 19 | 47 | 38 | 22.8 | M24 |
| DIN208050SEM27X38 | 50 | 27 | 21 | 58 | 38 | 22.8 | M24 |
| DIN208050SEM32X36 | 50 | 32 | 24 | 66 | 36 | 20.8 | M24 |
| DIN208050SEM40X40 | 50 | 40 | 27 | 82 | 40 | 24.8 | M24 |

(Option:Wrench for lock Screw)

## TUNGHOLD
### DIN2080-FM (Face mill holder)
Face mill holder with DIN2080 shank




| Designation | SS | ød | L2 | øD1 | øD3 | L1 | L | G2 | øD5 | G1 | G |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DIN208040FM40 | 40 | 40 | 27 | 88 | - | - | 20 | M12 | 66.7 | M20 | M16 |
| DIN208050FM40 | 50 | 40 | 27 | 97.5 | 88 | 20.8 | 36 | M12 | 66.7 | M20 | M24 |
| DIN208050FM60 | 50 | 60 | 40 | 128 | - | - | 35.8 | M16 | 101.6 | - | M24 |

(Option:Wrench for lock Screw)

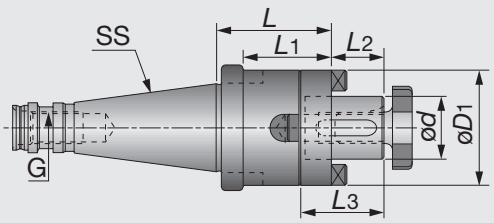
Tooling System

Pull stud F118
Clamping screw F123
Wrench F125

TUNGHOLD

## DIN2080-SEMC (Combination holder for slot mill & shell mill)

Combination holder with DIN2080 shank

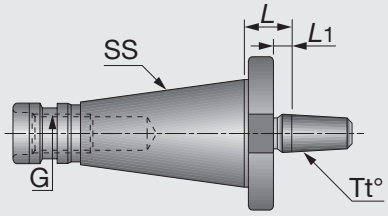



| Designation | SS | ød | L2 | øD1 | L | L1 | L3 | G |
|---|---|---|---|---|---|---|---|---|
| DIN208030SEMC16X35 | 30 | 16 | 17 | 32 | 35 | 25.4 | 27 | M12 |
| DIN208030SEMC22X35 | 30 | 22 | 19 | 40 | 35 | 25.4 | 31 | M12 |
| DIN208030SEMC27X35 | 30 | 27 | 21 | 48 | 35 | 25.4 | 33 | M12 |
| DIN208030SEMC32X50 | 30 | 32 | 24 | 58 | 50 | 40.4 | 38 | M12 |
| DIN208040SEMC22X52 | 40 | 22 | 19 | 40 | 52 | 40.4 | 31 | M16 |
| DIN208040SEMC27X52 | 40 | 27 | 21 | 48 | 52 | 40.4 | 33 | M16 |
| DIN208040SEMC32X52 | 40 | 32 | 24 | 58 | 52 | 40.4 | 38 | M16 |
| DIN208040SEMC40X52 | 40 | 40 | 27 | 70 | 52 | 40.4 | 41 | M16 |
| DIN208050SEMC16X55 | 50 | 16 | 17 | 32 | 55 | 39.8 | 27 | M24 |
| DIN208050SEMC22X55 | 50 | 22 | 19 | 40 | 55 | 39.8 | 31 | M24 |
| DIN208050SEMC27X55 | 50 | 27 | 21 | 48 | 55 | 39.8 | 33 | M24 |
| DIN208050SEMC32X55 | 50 | 32 | 24 | 58 | 55 | 39.8 | 38. | M24 |
| DIN208050SEMC40X55 | 50 | 40 | 27 | 70 | 55 | 39.8 | 41 | M24 |
| DIN208050SEMC50X55 | 50 | 50 | 30 | 90 | 55 | 39.8 | 46 | M24 |

TUNGHOLD

## DIN2080-DC (Jacobs taper holder)

Jacobs taper holder with DIN2080 shank



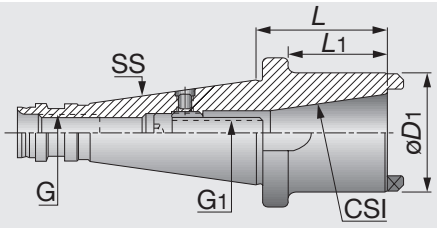

| Designation | SS | Tt° | L | L1 | G |
|---|---|---|---|---|---|
| DIN208030DCB16X20 | 30 | B16 | 20 | 5.4 | M12 |
| DIN208040DCB16X22 | 40 | B16 | 22 | 10.4 | M16 |
| DIN208040DCB18X25 | 40 | B18 | 25 | 13.4 | M16 |
| DIN208050DCB16X25 | 50 | B16 | 25 | 9.8 | M24 |
| DIN208050DCB18X25 | 50 | B18 | 25 | 9.8 | M24 |



Pull stud F118
Clamping screw F123
Wrench F125

## TUNGHOLD
### DIN2080 AD (Conversion adaptor)

Conversion adaptor for DIN2080 system




| Designation | SS | CSI | L | øD1 | L1 | G1 | G |
|---|---|---|---|---|---|---|---|
| DIN208050AD40 | 50 | DIN2080 | 50 | 63 | 34.8 | M16 | M24 |

## TUNGHOLD
### DIN2080-MT DRW (Hoder for draw bar)

Morse taper holder with draw bar for DIN2080

Fig. 1

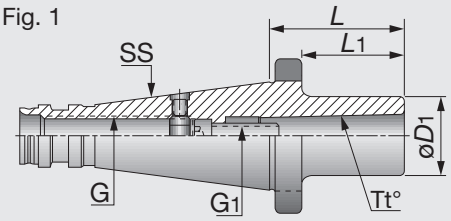
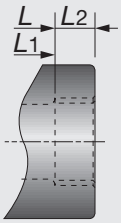



Fig. 2(1)




| Designation | SS | Tt° | L | øD1 | L1 | L2 | G1 | G | Fig. |
|---|---|---|---|---|---|---|---|---|---|
| DIN208040MT1DRW | 40 | MT1 | 50 | 25 | 38.4 | - | M6 | M16 | 1 |
| DIN208040MT2DRW | 40 | MT2 | 50 | 32 | 38.4 | - | M10 | M16 | 1 |
| DIN208040MT3DRW | 40 | MT3 | 65 | 40 | 53.4 | - | M12 | M16 | 1 |
| DIN208040MT4DRW | 40 | MT4 | 95 | 63 | - | 15 | M16 | M16 | 2 |
| DIN208050MT1DRW | 50 | MT1 | 60 | 25 | 44.8 | - | M6 | M24 | 1 |
| DIN208050MT2DRW | 50 | MT2 | 60 | 32 | 44.8 | - | M10 | M24 | 1 |
| DIN208050MT3DRW | 50 | MT3 | 65 | 40 | 49.8 | - | M12 | M24 | 1 |
| DIN208050MT4DRW | 50 | MT4 | 65 | 63 | 49.8 | 15 | M16 | M24 | 2 |
| DIN208050MT5DRW | 50 | MT5 | 100 | 78 | 84.4 | 18 | M20 | M24 | 2 |

(1) DIN2201.

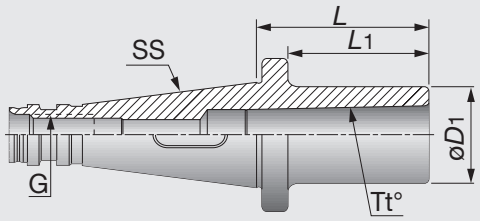


Pull stud
F118

TUNGHOLD

## DIN2080-MT (Holder for morse taper)

Morse taper holder with DIN2080 shank

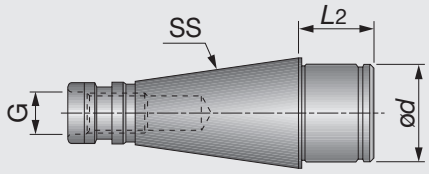



| Designation | SS | Tt° | L | øD1 | L1 | G |
|---|---|---|---|---|---|---|
| DIN208030MT2X50 | 30 | MT2 | 50 | 32 | 40.4 | M12 |
| DIN208030MT3X70 | 30 | MT3 | 70 | 40 | 60.4 | M12 |
| DIN208040MT1X50 | 40 | MT1 | 50 | 25 | 38.4 | M16 |
| DIN208040MT2X50 | 40 | MT2 | 50 | 32 | 38.4 | M16 |
| DIN208040MT3X65 | 40 | MT3 | 65 | 40 | 53.4 | M16 |
| DIN208040MT4X95 | 40 | MT4 | 95 | 48 | 83.4 | M16 |
| DIN208050MT1X45 | 50 | MT1 | 45 | 25 | 29.8 | M24 |
| DIN208050MT2X60 | 50 | MT2 | 60 | 32 | 44.8 | M24 |
| DIN208050MT3X65 | 50 | MT3 | 65 | 40 | 49.8 | M24 |
| DIN208050MT4X70 | 50 | MT4 | 70 | 48 | 54.8 | M24 |
| DIN208050MT5X105 | 50 | MT5 | 105 | 63.5 | 89.2 | M24 |

TUNGHOLD

## DIN2080-CP(Center plug holder)

Center plugs for DIN2080 shank




| Designation | SS | ød | L2 | G |
|---|---|---|---|---|
| DIN208040CP40 | 40 | 40 | 29 | M16 |
| DIN208050CP60 | 50 | 60 | 39 | M24 |

## Turning tool

| | | | | | | |
|---|---|---|---|---|---|---|
| CN**1204<br>CN**0904 | TUNGTJET<br>C*PCLNR/L*****-**-CHP | C*PCLNR/L*****-12N | C*ACLNR/L*****-**N | TUNGTJET<br>C6PCMNN**-CHP | C*ACLNN00***-**N<br>C*ACLNN00***V-**N | Cutting head for external turning & facing |
| DN**1504**<br>(DN**1506**) | TUNGTJET<br>C*PDJNR/L*****-**-CHP | C*PDJNR/L*****-15N | C*ADJNR/L*****-**N | TUNGTJET<br>C6PDMNL**-CHP | C*ADNNN00***-15N | |
| WN**0804<br>WN**0604 | TUNGTJET<br>C*PWLNR/L*****-**-CHP | C*AWLNR/L*****-**N | VN**1604** | TUNGTJET<br>C*PVJNR/L*****-16-CHP | C*AVJNR/L*****-16N | |
| TN**1604<br>TN**1104 | C4PTJNR/L<br>27050-1104N | C4ATJNR/L<br>27050-16N | VC**1604** | C*SVJCR/L*****-16N | C*SVVCN00***-16N | |
| DN**1104 | C4PDUNR/L-11 | DN**1504 | C*ADUNR/L*****-15 | CN**1204<br>CN**0904 | C4PCLNR/L*****-** | Cutting head for internal turning |
| WX**0403**L-** | C4SWLXR11070-04 | DX**0703**L-** | C4SDXXR*****-07 | VB**1103**<br>VB**1604** | C4SVQBR*****-** | |
| DRILLMEISTER<br>TUNGDRILL<br>TUNGSIX-DRILL | Side-lock holder<br>(For weldon-shank)<br>C*EM**X**<br>Side-lock holder<br>(For whistle-notch shank)<br>C*EM**X**E | | Boring bar | Sleeve<br>SC****** | Adaptor for boring bar<br>C*ABB**-**<br>C*ADI** | |
| | | | | | TungDrill Twisted<br>C*TDX***L***-3 | |
| | 16ER/L*** | C*CER/L*****-16ERN | | | | Cutting head for threading |
| DGS, SGS, DGM, SGM, DTX, DTE, DGG, DTR, SGN | Blade | Adaptor for parting-off blade | TUNGCUT<br>C*CHSR/L*****N | TUNGCUT<br>C*CHFVR/L*****N | | Cutting head for grooving |
| Toolholder for external turning | C*ADES-20 | C*ASHR/L**-45 | C*ASHR/L*** | C*ASHA20 | C*ADE-**R/L | Adaptor for toolholder with square shank |

Tooling System

# System for Multi-Tasking Machine

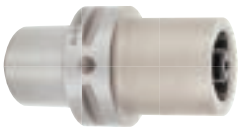
## TOOLING SYSTEM

### Tool spindle



Extension adaptor

C*EX-**



Reduction adaptor

C*-C*RE-***

Adaptor for C4 or C5 coupling

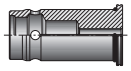
### Tool spindle

Endmill holder



C*MAXIN**X***

Straight collet for endmill holder



SC*******



Side-lock holder (For weldon-shank)



C*EM**X**



Side-lock holder (For whistle-notch shank)



C*EM**X**E



ER-collet chuck holder



C*ER**X***
C*ER**X***M

ER-collet



ER******



Collet chuck holder with adjusting alignment

TUNGFINE



ADJC*ER32

ER-collet



ER******



Shrink holder

TUNGSHRINK



C*SRKIN*X**



Arbor for face mill



C*SEM**X**C



Arbor for slot mill



C*FM**X**



Holder for modular tool

TUNGFIX



C*ODP**X**



High speed spindle

SPINJET



TJS**KC*L/R



Tung-Tri shoulder cutter



C*EPA**M***R**L***

Tung-Tri shoulder cutter



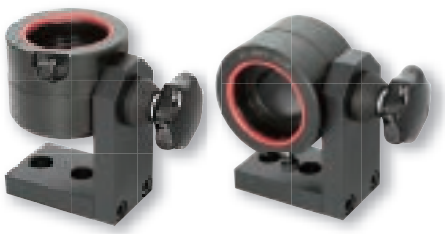
C6TLA15M***R**L***

TungDrill Twistedドリル



C*TDX***L***-3

Tool clamp

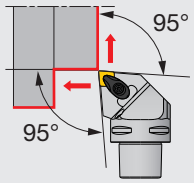


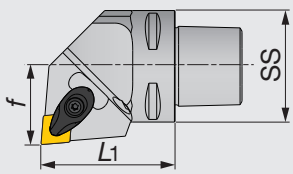
MULTICLAMPC*

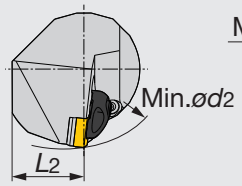
Tooling System

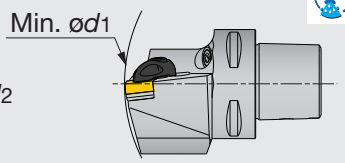
## C-ACLNR/L

TurningA double-clamp toolholder with 95° approach angle, for negative 80° rhombic inserts




Right hand (R) shown.

| Designation | SS | $L_1$ | $L_2$ | f | Min ød1 | Min ød2 | rε | Insert |
|---|---|---|---|---|---|---|---|---|
| C4ACLNR/L27050-12N(2) | 40 | 50 | 25 | 27 | 140 | 110 | 0.8 | CN**1204... |
| C5ACLNR/L35060-12N(2) | 50 | 60 | 32 | 35 | 165 | 110 | 0.8 | CN**1204... |
| C6ACLNR45065-12(1) | 63 | 65 | 41 | 45 | - | - | 0.8 | CN**1204... |
| C6ACLNR/L45065-12N(2) | 63 | 65 | 41 | 45 | 190 | 125 | 0.8 | CN**1204... |
| C6ACLNR/L45065-16N(2) | 63 | 65 | 41 | 45 | 190 | 125 | 1.2 | CN**1604... |

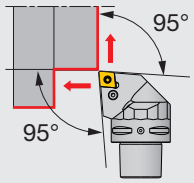
(1) Applicable for normal pressure coolant. (2) Applicable for 7 MPa pressure coolant.

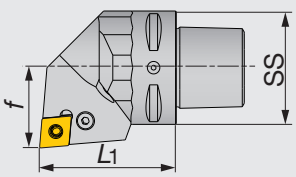
### SPARE PARTS

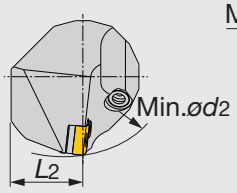
| Designation | Clamp | Clamping screw | Coolant parts | Shim | Shim screw | Spring | Spring 1 | Wrench | Wrench 1 |
|---|---|---|---|---|---|---|---|---|---|
| C4ACLN*27050-12N | ACP4S | ACS-5W | SATZ-M8X1-M3 | ASC422 | CSTB-3.5 | BP-7 | SP-2.5 | - | T-15F |
| C5ACLN*35060-12N | ACP4S | ACS-5W | SATZ-M8X1-M3 | ASC422 | CSTB-3.5 | BP-7 | SP-2.5 | - | T-15F |
| C6ACLNR45065-12 | ACP4S | ACS-5W | EZ83 | ASC422 | CSTB-3.5 | BP-7 | SP-2.5 | - | T-15F |
| **C6ACLN*45065-12N** | ACP4S | ACS-5W | SATZ-M8X1-M3 | ASC422 | CSTB-3.5 | BP-7 | SP-2.5 | - | T-15F |
| C6ACLN*45065-16N | ACP5S | ACS-6W | SATZ-M8X1-M3 | ASC533 | CSTB-5 | BP-8.8 | SP-2.5 | KEYV-T20 | - |

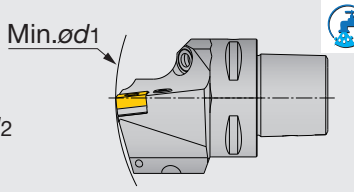
## C-PCLNR/L

Lever lock type toolholder with 95° approach angle, for negative 80° rhombic inserts




Right hand (R) shown.

| Designation | SS | $L_1$ | $L_2$ | f | Min ød1 | Min ød2 | rε | Insert |
|---|---|---|---|---|---|---|---|---|
| C5PCLNR/L35060-12(1) | 50 | 60 | 32 | 35 | - | - | 0.8 | CN**1204... |
| C5PCLNR/L35060-12N(2) | 50 | 60 | 32 | 35 | 165 | 110 | 0.8 | CN**1204... |
| C6PCLNR/L45065-12N(2) | 63 | 65 | 41 | 45 | 190 | 125 | 0.8 | CN**1204... |

(1) Applicable for normal pressure coolant. (2) Applicable for 7 MPa pressure coolant.

### SPARE PARTS

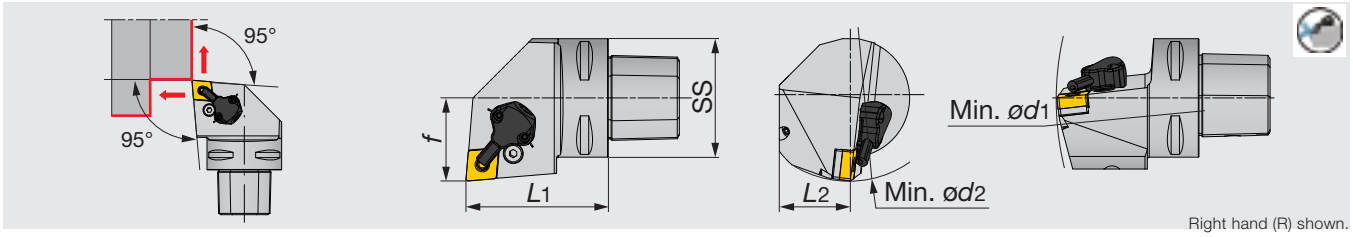
| Designation | Coolant parts | Lever | Screw | Shim | Spring | Wrench |
|---|---|---|---|---|---|---|
| C5PCLN*35060-12 | EZ104 | LCL4 | LCS4 | LSC42 | LSP4 | P-3 |
| C*PCLN**506*-12N | SATZ-M10X1-M5 | LCL4 | LCS4 | LSC42 | LSP4 | P-3 |

Tooling System

Inserts for C-ACLNR/L, C-PCLNR/L → **B050 -,** CBN → **B163 -,** PCD → **B176**

## C-PCLNR/L-CHP

Lever lock type toolholder with 95° approach angle, for negative 80° rhombic inserts




Right hand (R) shown.

| Designation | SS | $L_1$ | $L_2$ | f | Min ød1 | Min ød2 | rε | Insert |
|---|---|---|---|---|---|---|---|---|
| C4PCLNR/L27050-0904-CHP | 40 | 50 | 25 | 27 | 140 | 110 | 0.8 | CN**0904... |
| C4PCLNR/L27050-12-CHP | 40 | 50 | 25 | 27 | 140 | 110 | 0.8 | CN**1204... |
| C5PCLNR/L35060-12-CHP | 50 | 60 | 32 | 35 | 165 | 110 | 0.8 | CN**1204... |
| C6PCLNR/L45065-0904-CHP | 63 | 65 | 41 | 45 | 190 | 125 | 0.8 | CN**0904... |
| C6PCLNR/L45065-12-CHP | 63 | 65 | 41 | 45 | 190 | 125 | 0.8 | CN**1204... |

Applicable for 14 MPa pressure coolant

### SPARE PARTS FOR P-TYPE

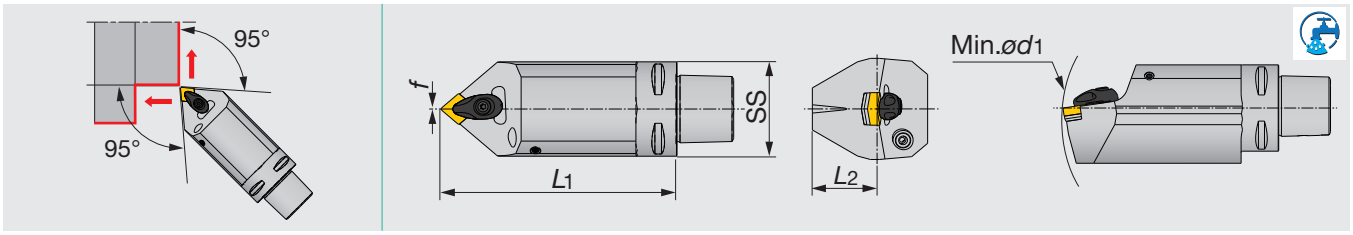
| Designation | Shim | Clamping screw | Wrench 1 | Spring pin | Lever |
|---|---|---|---|---|---|
| C*PCLNR/L**-12-CHP | LSC42 | LCS4 | P-3 | LSP4 | LCL4 |
| C*PCLNR/L**0904-CHP | LSC317 | LCS3 | P-2.5 | LSP3 | LCL33 |

### COOLANT SET

| Designation | Coolant unit | Mounting screw | Wrench 2 | O-ring |
|---|---|---|---|---|
| C*PCLNR/L**-CHP | CU-CW-CHP | SRM3 | T-8F | OR6.4X0.9N |

## C-ACLNN

TurningA double-clamp toolholder with 95° approach angle, for negative 80° rhombic inserts




| Designation | SS | $L_1$ | $L_2$ | f | Min ød1 | rε | Insert |
|---|---|---|---|---|---|---|---|
| C5ACLNN00090-12(1) | 50 | 90 | 32 | 0 | - | 0.8 | CN**1204... |
| C5ACLNN00090-12N(2) | 50 | 90 | 32 | 0 | 165 | 0.8 | CN**1204... |
| C5ACLNN00125-12(1) | 50 | 125 | 32 | 0 | - | 0.8 | CN**1204... |
| C5ACLNN00125-12N(2) | 50 | 125 | 32 | 0 | 165 | 0.8 | CN**1204... |
| C6ACLNN00100-12N(2) | 63 | 100 | 37.5 | 0 | 190 | 0.8 | CN**1204... |
| C6ACLNN00140-12N(2) | 63 | 140 | 37.5 | 0 | 190 | 0.8 | CN**1204... |

(1) Applicable for normal pressure coolant. (2) Applicable for 7 MPa pressure coolant.

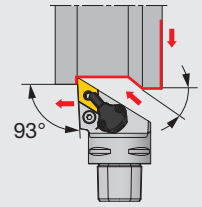
### SPARE PARTS

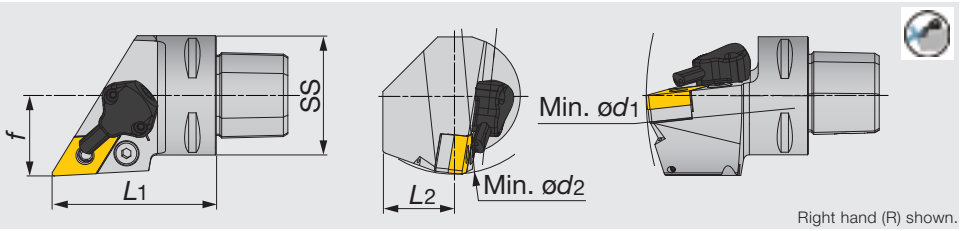
| Designation | Clamp | Clamping screw | Coolant parts | Shim | Shim screw | Spring | Spring 1 | Wrench |
|---|---|---|---|---|---|---|---|---|
| C5ACLNN00090-12 | ACP4S | ACS-5W | EZ83 | ASC422 | CSTB-3.5 | BP-7 | SP-2.5 | T-15F |
| C5ACLNN00090-12N | ACP4S | ACS-5W | SATZ-M8X1-M3 | ASC422 | CSTB-3.5 | BP-7 | SP-2.5 | T-15F |
| C5ACLNN00125-12 | ACP4S | ACS-5W | EZ83 | ASC422 | CSTB-3.5 | BP-7 | SP-2.5 | T-15F |
| C*ACLNN001**-12N | ACP4S | ACS-5W | SATZ-M8X1-M3 | ASC422 | CSTB-3.5 | BP-7 | SP-2.5 | T-15F |

Inserts for C-PCLNR/L-CHP, C-ACLNN → **B050 -,** CBN → **B163 -,** PCD → **B176**

## C-PDJNR/L-CHP

Lever lock type toolholder with TungCap connection, for negative inserts, D 55° rhombic with channels for high pressure coolant




Right hand (R) shown.

| Designation | SS | $L_1$ | $L_2$ | f | Min ød1 | Min ød2 | rε | Insert |
|---|---|---|---|---|---|---|---|---|
| C4PDJNR/L27050-1104-CHP | 40 | 50 | 25 | 27 | 140 | 110 | 0.8 | DN**1104... |
| C4PDJNR/L27050-15-CHP | 40 | 50 | 25 | 27 | 140 | 110 | 0.8 | DN**1504(06)... |
| C5PDJNR/L35060-15-CHP | 50 | 60 | 32 | 35 | 165 | 110 | 0.8 | DN**1504(06)... |
| C6PDJNR/L45065-1104-CHP | 63 | 65 | 41 | 45 | 190 | 110 | 0.8 | DN**1104... |
| C6PDJNR/L45065-15-CHP | 63 | 65 | 41 | 45 | 190 | 110 | 0.8 | DN**1504(06)... |

Applicable for 14 MPa pressure coolant

### SPARE PARTS FOR P-TYPE

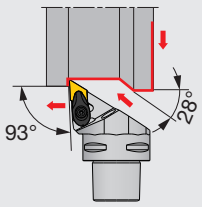
| Designation | Shim | Clamping screw | Wrench 1 | Spring pin | Lever |
|---|---|---|---|---|---|
| C*PDJNR/L**-15-CHP | LSD43A | LCS4 | P-3 | LSP4 | LCL4 |
| C*PDJNR/L**1104-CHP | ELSD32 | LCS3 | P-2.5 | LSP3 | LCL33L |

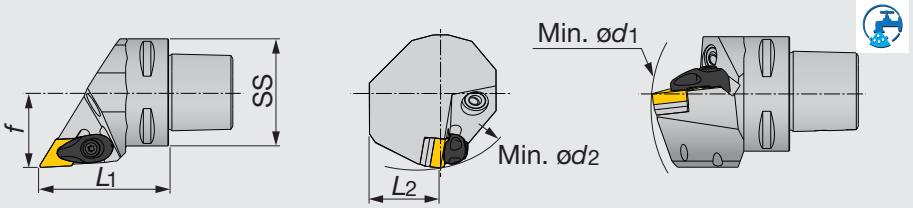
### COOLANT SET

| Designation | Coolant unit | Mounting screw | Wrench 2 | O-ring |
|---|---|---|---|---|
| C*PDJLNR/L**-CHP | CU-D-CHP | SRM3 | T-8F | OR6.4X0.9N |

## C-ADJNR/L

TurningA double-clamp toolholder with 93° approach angle, for negative 55° rhombic inserts




Right hand (R) shown.

| Designation | SS | $L_1$ | $L_2$ | f | Min ød1 | Min ød2 | rε | Insert |
|---|---|---|---|---|---|---|---|---|
| C4ADJNR/L27050-15N(2) | 40 | 50 | 25 | 27 | 145 | 110 | 0.8 | DN**15... |
| C5ADJNR/L35060-15N(2) | 50 | 60 | 32 | 35 | 165 | 110 | 0.8 | DN**15... |
| C6ADJNR/L45065-15(1) | 63 | 65 | 41 | 45 | - | - | 0.8 | DN**15... |
| C6ADJNR/L45065-15N(2) | 63 | 65 | 41 | 45 | 190 | 110 | 0.8 | DN**15... |
| C6ADJNR/L45135-15N(2) | 63 | 135 | 41 | 45 | 190 | 110 | 0.8 | DN**15... |

(1) Applicable for normal pressure coolant (2) Applicable for 7 MPa pressure coolant

### SPARE PARTS

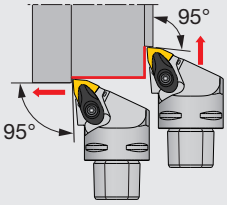
| Designation | Clamp | Clamping screw | Coolant parts | Shim | Shim screw | Spring | Spring 1 | Wrench |
|---|---|---|---|---|---|---|---|---|
| C4ADJN*27050-15N | ACP4S | ACS-5W | SATZ-M10X1-M5 | ASD432 | CSTB-3.5 | BP-7 | SP-2.5 | T-15F |
| C5ADJN*35060-15N | ACP4S | ACS-5W | SATZ-M10X1-M5 | ASD432 | CSTB-3.5 | BP-7 | SP-2.5 | T-15F |
| C6ADJNL45065-15 | ACP4S | ACS-5W | EZ104 | ASD432 | CSTB-3.5 | BP-7 | SP-2.5 | T-15F |
| C6ADJN*45065-15N | ACP4S | ACS-5W | SATZ-M10X1-M5 | ASD432 | CSTB-3.5 | BP-7 | SP-2.5 | T-15F |
| C6ADJN*45135-15N | ACP4S | ACS-5W | SATZ-M10X1-M5 | ASD432 | CSTB-3.5 | BP-7 | SP-2.5 | T-15F |

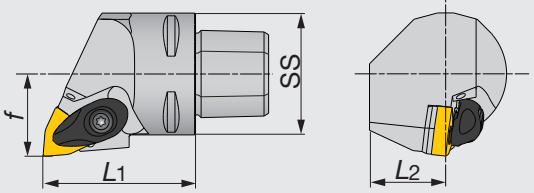
Option: ASD423 (Shim for DN**1506**)

Inserts for C-ADJNR/L, C-PDJNR/L-CHP → **B061 -,** CBN → **B163 -,** PCD → **B176**

# TUNGCAP
## C-AWLNR/L

TurningA double-clamp toolholder with 95° approach angle, for negative trigon inserts




Right hand (R) shown.

| Designation | SS | $L_1$ | $L_2$ | f | $r_\varepsilon$ | Insert |
|---|---|---|---|---|---|---|
| C4AWLNR/L27050-08N | 40 | 50 | 25 | 27 | 0.8 | WN**0804... |

Applicable for 7 MPa pressure coolant.

### SPARE PARTS

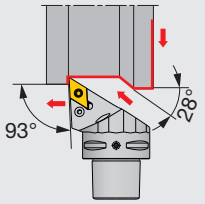
| Designation | Clamp | Clamping screw | Screw | Shim | Spring | Spring 1 | Wrench |
|---|---|---|---|---|---|---|---|
| C-AWLNR/L | ACP4S | CSTB-3.5 | ACS-5W | ASW422 | BP-7 | SP-2.5 | T-15F |

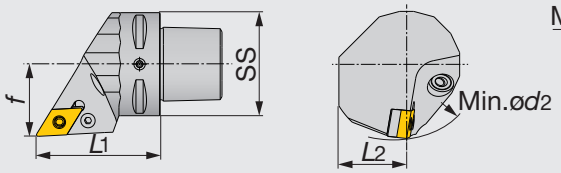
Tooling System

Inserts for C-AWLNR/L → **B090 -,** CBN → **B165**

## C-PDJNR/L

Lever lock type toolholder with 93° approach angle, for negative 55° rhombic inserts




Right hand (R) shown.

| Designation | SS | $L_1$ | $L_2$ | f | Min ød1 | Min ød2 | rε | Insert |
|---|---|---|---|---|---|---|---|---|
| C5PDJNR/L35060-15N | 50 | 60 | 32 | 35 | 165 | 110 | 0.8 | DN**15... |
| C6PDJNR/L45065-15N | 63 | 65 | 41 | 45 | 195 | 95 | 0.8 | DN**15... |

Applicable for 7 MPa pressure coolant.

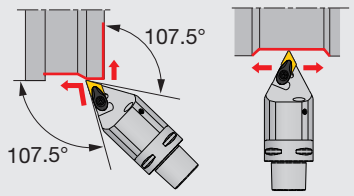
### SPARE PARTS

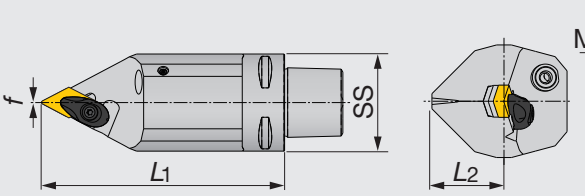
| Designation | Coolant parts | Lever | Screw | Screw 1 | Spring | Wrench |
|---|---|---|---|---|---|---|
| C5PDJN*35060-15N | SATZ-M10X1-M5 | LCL4 | LCS4 | SSHM4-4 | LSP4(04) | P-3 |
| C6PDJN*45065-15N | SATZ-M10X1-M5 | LCL4 | LCS4 | SSHM4-4 | LSP4S(09) | P-3 |

option: ASD423 (Shim for DN**1506**)

## C-ADNNN

TurningA double-clamp toolholder with 63° approach angle, for negative 55° rhombic inserts




| Designation | SS | $L_1$ | $L_2$ | f | Min ød1 | rε | Insert |
|---|---|---|---|---|---|---|---|
| C5ADNNN00090-15(1) | 50 | 90 | 32 | 0 | - | 0.8 | DN**15... |
| C5ADNNN00090-15N(2) | 50 | 90 | 32 | 0 | 165 | 0.8 | DN**15... |
| C5ADNNN00125-15(1) | 50 | 125 | 32 | 0 | - | 0.8 | DN**15... |
| C5ADNNN00125-15N(2) | 50 | 125 | 32 | 0 | 165 | 0.8 | DN**15... |
| C6ADNNN00100-15(1) | 63 | 100 | 37.5 | 0 | - | 0.8 | DN**15... |
| C6ADNNN00100-15N(2) | 63 | 100 | 37.5 | 0 | 190 | 0.8 | DN**15... |
| C6ADNNN00140-15(1) | 63 | 140 | 37.5 | 0 | - | 0.8 | DN**15... |
| C6ADNNN00140-15N(2) | 63 | 140 | 37.5 | 0 | 190 | 0.8 | DN**15... |

(1) Applicable for normal pressure coolant. (2) Applicable for 7 MPa pressure coolant.

### SPARE PARTS

| Designation | Clamp | Clamping screw | Coolant parts | Shim | Shim screw | Spring | Spring 1 | Wrench |
|---|---|---|---|---|---|---|---|---|
| C5ADNNN00090-15 | ACP4S | ACS-5W | EZ104 | ASD432 | CSTB-3.5 | BP-7 | SP-2.5 | T-15F |
| C5ADNNN00090-15N | ACP4S | ACS-5W | SATZ-M10X1-M5 | ASD432 | CSTB-3.5 | BP-7 | SP-2.5 | T-15F |
| C5ADNNN00125-15 | ACP4S | ACS-5W | EZ104 | ASD432 | CSTB-3.5 | BP-7 | SP-2.5 | T-15F |
| C5ADNNN00125-15N | ACP4S | ACS-5W | SATZ-M10X1-M5 | ASD432 | CSTB-3.5 | BP-7 | SP-2.5 | T-15F |
| C6ADNNN00100-15 | ACP4S | ACS-5W | EZ104 | ASD432 | CSTB-3.5 | BP-7 | SP-2.5 | T-15F |
| C6ADNNN00100-15N | ACP4S | ACS-5W | SATZ-M10X1-M5 | ASD432 | CSTB-3.5 | BP-7 | SP-2.5 | T-15F |
| C6ADNNN00140-15 | ACP4S | ACS-5W | EZ104 | ASD432 | CSTB-3.5 | BP-7 | SP-2.5 | T-15F |
| C6ADNNN00140-15N | ACP4S | ACS-5W | SATZ-M10X1-M5 | ASD432 | CSTB-3.5 | BP-7 | SP-2.5 | T-15F |

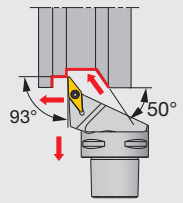
option: ASD423 (Shim for DN**1506**)

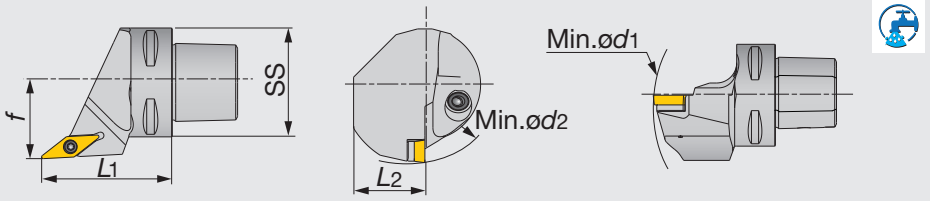
Tooling System

Inserts for C-PDJNR/L, C-ADNNN → **B061 -**, CBN → **B163 -**, PCD → **B176**

## C-SVJCR/L

Screw-on clamp toolholder with 93° approach angle, for positive 35° rhombic inserts




Right hand (R) shown.

| Designation | SS | $L_1$ | $L_2$ | f | Min ø$d_1$ | Min ø$d_2$ | $r_\varepsilon$ | Insert |
|---|---|---|---|---|---|---|---|---|
| C5SVJCR/L35060-16(1) | 50 | 60 | 32 | 35 | - | - | 0.8 | VC**1604... |
| C5SVJCR/L35060-16N(2) | 50 | 60 | 32 | 35 | 170 | 160 | 0.8 | VC**1604... |
| C6SVJCR/L45065-16(1) | 63 | 65 | 41 | 45 | - | - | 0.8 | VC**1604... |
| C6SVJCR/L45065-16N(2) | 63 | 65 | 41 | 45 | 170 | 190 | 0.8 | VC**1604... |

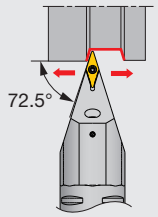
(1) Applicable for normal pressure coolant. (2) Applicable for 7 MPa pressure coolant.

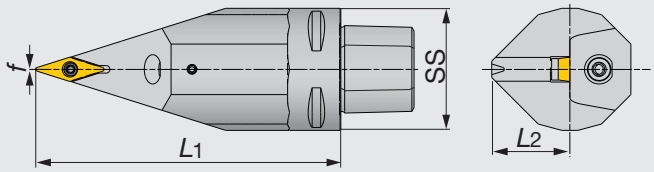
### SPARE PARTS

| Designation | Clamping screw | Coolant parts | Shim | Shim screw | Wrench | Wrench 1 |
|---|---|---|---|---|---|---|
| C5SVJC*35060-16 | CSTB-3.5L | EZ104 | SSV32 | DTS5-3.5 | P-3.5 | T-15F |
| C5SVJC*35060-16N | CSTB-3.5L | SATZ-M10X1-M5 | SSV32 | DTS5-3.5 | P-3.5 | T-15F |
| C6SVJC*45065-16 | CSTB-3.5L | EZ104 | SSV32 | DTS5-3.5 | P-3.5 | T-15F |
| C6SVJC*45065-16N | CSTB-3.5L | SATZ-M10X1-M5 | SSV32 | DTS5-3.5 | P-3.5 | T-15F |

## C-SVVCN

Screw-on clamp toolholder with 72.5° approach angle, for positive 35° rhombic inserts




| Designation | SS | $L_1$ | $L_2$ | f | $r_\varepsilon$ | Insert |
|---|---|---|---|---|---|---|
| C5SVVCN00090-16(1) | 50 | 90 | 32 | 0 | 0.8 | VC**1604... |
| C5SVVCN00090-16N(2) | 50 | 90 | 32 | 0 | 0.8 | VC**1604... |
| C5SVVCN00125-16(1) | 50 | 125 | 32 | 0 | 0.8 | VC**1604... |
| C5SVVCN00125-16N(2) | 50 | 125 | 32 | 0 | 0.8 | VC**1604... |
| C6SVVCN00100-16(1) | 63 | 100 | 37.5 | 0 | 0.8 | VC**1604... |
| C6SVVCN00100-16N(2) | 63 | 100 | 37.5 | 0 | 0.8 | VC**1604... |
| C6SVVCN00140-16(1) | 63 | 140 | 37.5 | 0 | 0.8 | VC**1604... |
| C6SVVCN00140-16N(2) | 63 | 140 | 37.5 | 0 | 0.8 | VC**1604... |

(1) Applicable for normal pressure coolant. (2) Applicable for 7 MPa pressure coolant.

### SPARE PARTS

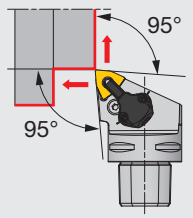
| Designation | Clamping screw | Coolant parts | Shim screw | Shim | Wrench | Wrench 1 |
|---|---|---|---|---|---|---|
| C5SVVCN00090-16 | CSTB-3.5L | EZ104 | DTS5-3.5 | SSV32 | P-3.5 | T-15F |
| C5SVVCN00090-16N | CSTB-3.5L | SATZ-M10X1-M5 | DTS5-3.5 | SSV32 | P-3.5 | T-15F |
| C5SVVCN00125-16 | CSTB-3.5L | EZ104 | DTS5-3.5 | SSV32 | P-3.5 | T-15F |
| C5SVVCN00125-16N | CSTB-3.5L | SATZ-M10X1-M5 | DTS5-3.5 | SSV32 | P-3.5 | T-15F |
| C6SVVCN00100-16 | CSTB-3.5L | EZ104 | DTS5-3.5 | SSV32 | P-3.5 | T-15F |
| C6SVVCN00100-16N | CSTB-3.5L | SATZ-M10X1-M5 | DTS5-3.5 | SSV32 | P-3.5 | T-15F |
| C6SVVCN00140-16 | CSTB-3.5L | EZ104 | DTS5-3.5 | SSV32 | P-3.5 | T-15F |
| C6SVVCN00140-16N | CSTB-3.5L | SATZ-M10X1-M5 | DTS5-3.5 | SSV32 | P-3.5 | T-15F |

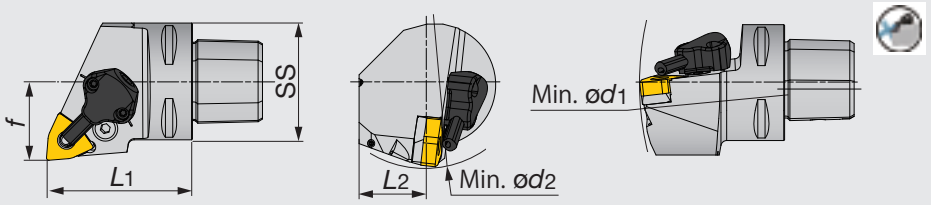
Tooling System

Inserts for C-SVJCR/L, C-SVVCN → **B145 -,** CBN → **B169 -,** PCD → **B177 -**

## C-PWLNR/L-CHP

Lever lock type toolholder with TungCap connection, for negative inserts, W 80° trigon with channels for high pressure coolant




Right hand (R) shown.

| Designation | SS | $L_1$ | $L_2$ | f | Min ød1 | Min ød2 | rε | Insert |
|---|---|---|---|---|---|---|---|---|
| C4PWLNR/L27050-0604-CHP | 40 | 50 | 25 | 27 | 140 | 110 | 0.8 | WN**0604... |
| C4PWLNR/L27050-08-CHP | 40 | 50 | 25 | 27 | 140 | 110 | 0.8 | WN**0804... |
| C6PWLNR/L45065-08-CHP | 63 | 65 | 41 | 45 | 190 | 125 | 0.8 | WN**0804... |

Applicable for 14 MPa pressure coolant

### SPARE PARTS FOR P-TYPE

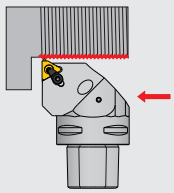
| Designation | Shim | Clamping screw | Wrench 1 | Spring pin | Lever |
|---|---|---|---|---|---|
| C*PWLNR/L**-08-CHP | LSW42BL | LCS4 | P-3 | LSP4 | LCL4 |
| C*PWLNR/L**0604-CHP | LSW312 | LCS3 | P-2.5 | LSP3 | LCL3 |

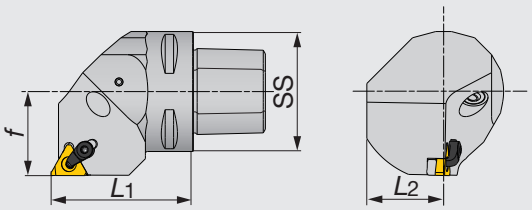
### COOLANT SET

| Designation | Coolant unit | Mounting screw | Wrench 2 | O-ring |
|---|---|---|---|---|
| C*PWLNR/L**-CHP | CU-CW-CHP | SRM3 | T-8F | OR6.4X0.9N |

## C-CER/L

TungThread external threading toolholders, altanative clamping of screw-on or clamp-on






Right hand (R) shown.

| Designation | SS | $L_1$ | $L_2$ | f | rε | Insert |
|---|---|---|---|---|---|---|
| C4CER/L27050-16ERN(2) | 40 | 50 | 25 | 27 | 0.8 | 16ER/L... |
| C5CER/L35060-16ER(1) | 50 | 60 | 32 | 35 | 0.8 | 16ER/L... |
| C5CER/L35060-16ERN(2) | 50 | 60 | 32 | 35 | 0.8 | 16ER/L... |
| C6CER/L45065-16ER(1) | 63 | 65 | 41 | 45 | 0.8 | 16ER/L... |
| C6CER/L45065-16ERN(2) | 63 | 65 | 41 | 45 | 0.8 | 16ER/L... |

(1) Applicable for normal pressure coolant. (2) Applicable for 7 MPa pressure coolant.

### SPARE PARTS

| Designation | Clamp set | Clamping screw | Coolant parts | Shim screw | Shim | Wrench | Wrench 1 |
|---|---|---|---|---|---|---|---|
| C5CE*35060-16ER | CSP16 | CSTB-3.5ST | EZ104 | DTS5-3.5 | A16-1DT | P-3.5 | T-15F |
| C5CE*35060-16ERN | CSP16 | CSTB-3.5ST | SATZ-M10X1-M5 | DTS5-3.5 | A16-1DT | P-3.5 | T-15F |
| C6CE*45065-16ER | CSP16 | CSTB-3.5ST | EZ104 | DTS5-3.5 | A16-1DT | P-3.5 | T-15F |
| C6CE*45065-16ERN | CSP16 | CSTB-3.5ST | SATZ-M10X1-M5 | DTS5-3.5 | A16-1DT | P-3.5 | T-15F |

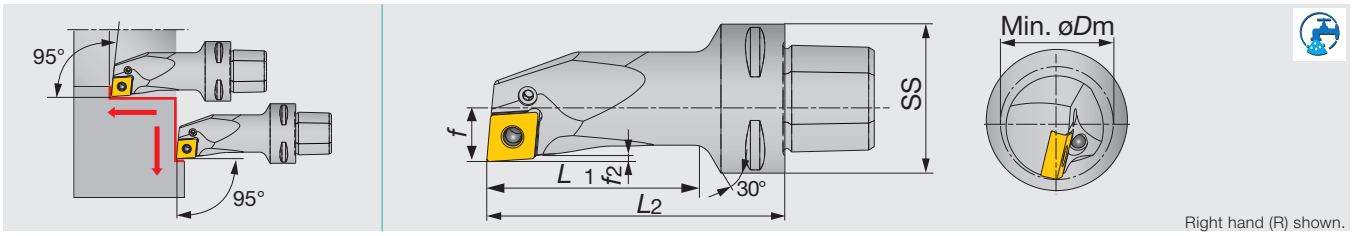


Inserts for C-PWLNR/L-CHP → **B090 -**, CBN → **B165**

Inserts for C-CER/L → **B384 -**

## C-PCLNR/L-IN

Lever lock type boring bar, for negative 80° rhombic inserts




Right hand (R) shown.

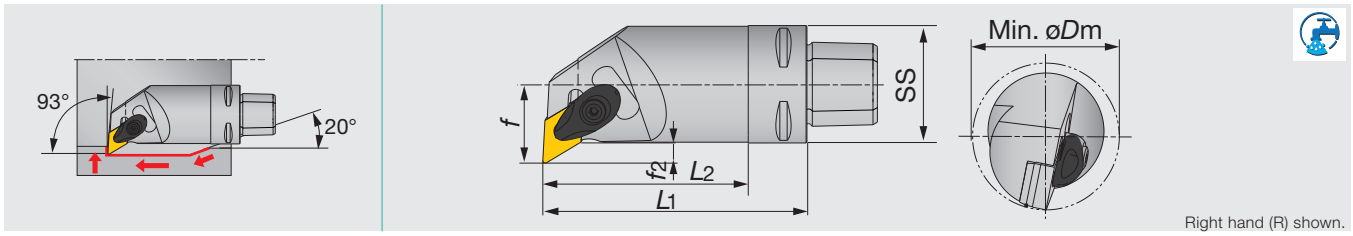
| Designation | øDm | SS | L2 | L1 | f | f2 | rε | Insert |
|---|---|---|---|---|---|---|---|---|
| C4PCLNR/L17080-12 | 32 | 40 | 80 | 58.5 | 17 | 1.6 | 0.8 | CN**1204... |

SPARE PARTS

| Designation | Lever | Screw | Wrench |
|---|---|---|---|
| C-PCLNR/L-IN | LCL43N | LCS43 | P-2.5 |

## C-ADUNR/L

TurningA double-clamp boring bar, for negative 55° rhombic inserts




Right hand (R) shown.

| Designation | øDm | SS | L1 | L2 | f | f2 | rε | Insert |
|---|---|---|---|---|---|---|---|---|
| C4ADUNR20070-15 | 38 | 40 | 70 | 50 | 20 | 5 | 0.8 | DN**1504... |
| C4ADUNR27090-15 | 50 | 40 | 90 | - | 27 | 7 | 0.8 | DN**1504... |

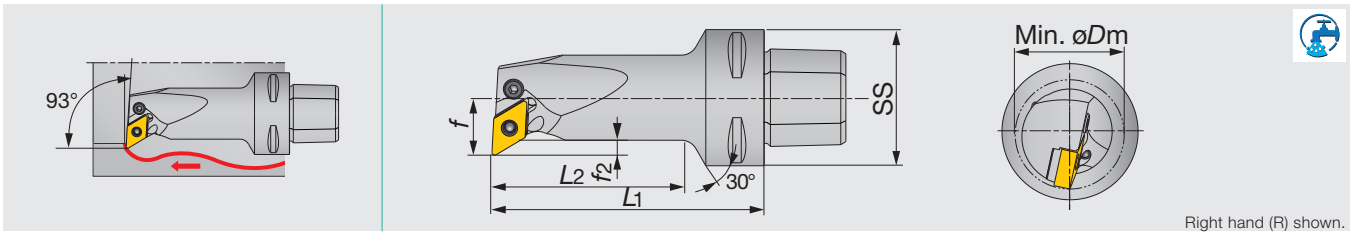
SPARE PARTS

| Designation | Clamp | Clamping screw | Screw | Shim | Spring | Spring 1 | Wrench |
|---|---|---|---|---|---|---|---|
| C-ADUNR/L | ACP4S | CSTB-3.5 | ACS-5W | ASD423(04) | BP-7 | SP-2.5 | T-15F |

option : ASD423 (Shim for DN**1506**)

## C-PDUNR/L

Lever lock type boring bar, for negative 55° rhombic inserts




Right hand (R) shown.

| Designation | øDm | SS | L1 | L2 | f | f2 | rε | Insert |
|---|---|---|---|---|---|---|---|---|
| C4PDUNR/L17080-11 | 32 | 40 | 80 | 58.5 | 17 | 4.4 | 0.8 | DN**1104... |

SPARE PARTS

| Designation | Lever | Screw | Shim | Spring | Wrench |
|---|---|---|---|---|---|
| C4PDUNR17080-11 | LCL33L | LCS3 | ELSD317BR | LSP3 | P-2.5 |
| C4PDUNL17080-11 | LCL33L | LCS3 | ELSD317BL | LSP3 | P-2.5 |

Inserts for C-PCLNR/L-IN → **B050 -**, CBN → **B163 -**, PCD → **B176**

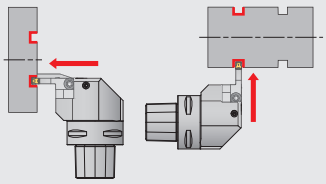
Inserts for C-ADUNR/L → **B061 -**, CBN → **B163 -**, PCD → **B176**

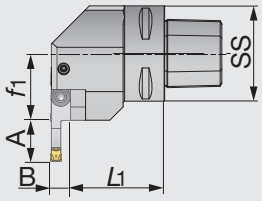
Inserts for C-PDUNR/L → **B061 -**

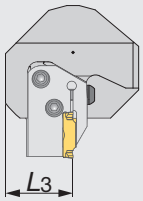
TUNGCAP

## C-CHFVR/L

TungCut shank of perpendicular toolholders for CAER/L & CAFR/L blades






Right hand (R) shown.

| Designation | SS | $L_1$ | $L_3$ | $f_1$ | A | B |
|---|---|---|---|---|---|---|
| C4CHFVR/L27050N(2) | 40 | 42.5 | 36 | 27 | Table* | Table* |
| C5CHFVR/L35060N(2) | 50 | 49.5 | 36 | 35 | Table* | Table* |
| C6CHFVR/L45065(1) | 63 | 54.5 | 41 | 45 | Table* | Table* |
| C6CHFVR/L45065N(2) | 63 | 54.5 | 41 | 45 | Table* | Table* |

(1) Applicable for normal pressure coolant. (2) Applicable for 7 MPa pressure coolant.
*See the below table for offset dimensions

### SPARE PARTS

| Designation | Coolant parts | Coolant parts 1 | Clamping screw | Wrench |
|---|---|---|---|---|
| C5CHFV*35060N | SATZ-M10X1-M5 | - | CSHB-6-A | P-4 |
| C6CHFV*45065 | CNZ125 | PNZ5 | CSHB-6-A | P-4 |
| C6CHFV*45065N | SATZ-M10X1-M5 | - | CSHB-6-A | P-4 |

### Combination of blade and toolholder

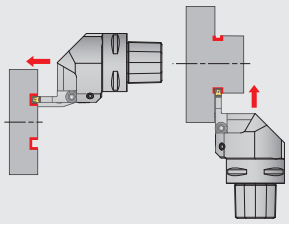
| Toolholder | Blade | | | |
|---|---|---|---|---|
| | CAER... | CAEL... | CAFR... | CAFL... |
| CHFVR... | | ● | ● | |
| CHFVL... | ● | | | ● |

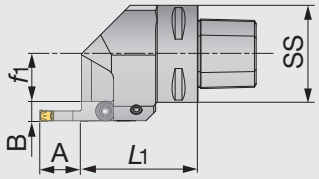
● : Correspondence

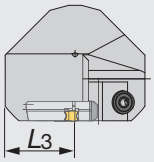
TUNGCAP

## C-CHSR/L

TungCut shank of toolholders for CAER/L & CAFR/L blades






Right hand (R) shown.

| Designation | SS | $L_1$ | $L_3$ | $f_1$ | A | B |
|---|---|---|---|---|---|---|
| C4CHSR/L27050N(2) | 40 | 50 | 36 | 16.5 | Table* | Table* |
| C5CHSR/L35060(1) | 50 | 60 | 36 | 24.5 | Table* | Table* |
| C5CHSR/L35060N(2) | 50 | 60 | 36 | 24.5 | Table* | Table* |
| C6CHSR/L45065N(2) | 63 | 65 | 41 | 34.5 | Table* | Table* |

(1) Applicable for normal pressure coolant. (2) Applicable for 7 MPa pressure coolant.
*See the below table for offset dimensions

### SPARE PARTS

| Designation | Coolant parts | Coolant parts 1 | Clamping screw | Wrench |
|---|---|---|---|---|
| C4CHS*27050N | SATZ-M8X1-M3 | - | CSHB-6-A | P-4 |
| C5CHS*35060 | CNZ125 | PNZ5 | CSHB-6-A | P-4 |
| C*CHS**506*N | SATZ-M10X1-M5 | - | CSHB-6-A | P-4 |

### Combination of blade and toolholder

| Toolholder | Blade | | | |
|---|---|---|---|---|
| | CAER... | CAEL... | CAFR... | CAFL... |
| CHSR... | ● | | | ● |
| CHSL... | | ● | ● | |

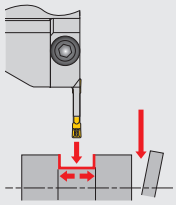
● : Correspondence

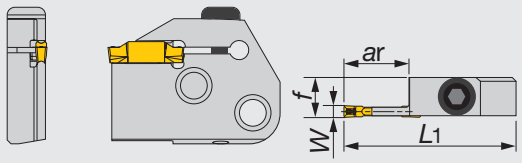
### *Table: Offset dimensions for blade

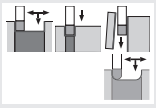
| Application | Blade | A | B |
|---|---|---|---|
| For external grooving | CAER/L-3T16 | 16 | 10.4 |
| | CAER/L-4T16 | 16 | 10.5 |
| | CAER/L-5T20 | 20 | 10.5 |
| | CAER/L-6T20 | 20 | 10.5 |
| For face grooving | CAFR/L-3T12-* | 12 | 10.4 |
| | CAFR/L-4T16-* | 16 | 10.5 |
| | CAFR/L-5T20-* | 20 | 10.5 |
| | CAFR/L-6T20-* | 25 | 10.5 |

## CAER/L

blades for external grooving & turning





Inserts:
DGS, SGS, DGM, SGM, DTX, DTE, DGG, DTR, SGN

Right hand (R) shown.

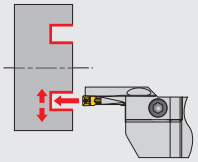
| Designation | Seat size | *ar* | *L*1 | *f* | Shank |
|---|---|---|---|---|---|
| CAER/L-3T16 | 3 | 16 | 45 | 10.4 | CHSR/L, CHRVL/R |
| CAER/L-4T16 | 4 | 16 | 45 | 10.5 | CHSR/L, CHRVL/R |
| CAER/L-5T20 | 5 | 20 | 49 | 10.5 | CHSR/L, CHRVL/R |
| CAER/L-6T20 | 6 | 20 | 49 | 10.5 | CHSR/L, CHRVL/R |

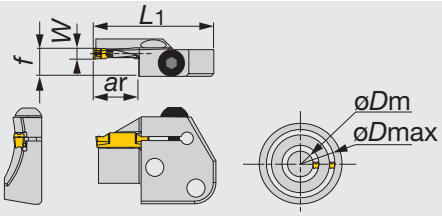
### SPARE PARTS

| Designation | Screw | Wrench |
|---|---|---|
| CAER/L | BHM6-20-A | P-4 |

## CAFR/L

blades for face grooving & turning








Inserts[5]
CAFR/L-3T12-040055: DTF
Shanks: CHFVR/L, CHSR/L

Right hand (R) shown.

| Designation | Seat size | *ø*Dm | *ø*Dmax | *ar* | *L*1 | *f* |
|---|---|---|---|---|---|---|
| CAFR/L-3T12-040055 | 3 | 40 | 55 | 12 | 45 | 10.4 |
| CAFR/L-3T12-055075 | 3 | 55 | 75 | 12 | 45 | 10.4 |
| CAFR/L-3T12-075100 | 3 | 75 | 100 | 12 | 45 | 10.4 |
| CAFR/L-3T12-100140 | 3 | 100 | 140 | 12 | 45 | 10.4 |
| CAFR/L-3T12-140200 | 3 | 140 | 200 | 12 | 45 | 10.4 |
| CAFR/L-4T16-050070 | 4 | 50 | 70 | 16 | 45 | 10.5 |
| CAFR/L-4T16-070100 | 4 | 70 | 100 | 16 | 45 | 10.5 |
| CAFR/L-4T16-100150 | 4 | 100 | 150 | 16 | 45 | 10.5 |
| CAFR/L-4T16-150250 | 4 | 150 | 250 | 16 | 45 | 10.5 |
| CAFR/L-5T20-055080 | 5 | 55 | 80 | 20 | 49 | 10.5 |
| CAFR/L-5T20-080120 | 5 | 80 | 120 | 20 | 49 | 10.5 |
| CAFR/L-5T20-120180 | 5 | 120 | 180 | 20 | 49 | 10.5 |
| CAFR/L-5T20-180300 | 5 | 180 | 300 | 20 | 49 | 10.5 |
| CAFR/L-5T20-300000 | 5 | 300 | ∞ | 20 | 49 | 10.5 |
| CAFR/L-6T25-060090 | 6 | 60 | 90 | 25[1] | 55 | 10.5 |
| CAFR/L-6T25-090150 | 6 | 90 | 150 | 25[1] | 55 | 10.5 |
| CAFR/L-6T25-150250 | 6 | 150 | 250 | 25[1] | 55 | 10.5 |
| CAFR/L-6T25-250400 | 6 | 250 | 400 | 25[1] | 55 | 10.5 |

(1) When groove depth is beyond the value of insert full length -1.5 mm, 1-conered insert is recommended.
(2) The value "*f*" is the dimension when the insert with groove width (W) in the above table is attached.
(3) Not applicable for CAFR/L-3T12-040055.
(4) Seat sizes of DTF are only 3 and 4.
(5) Min. diameter *ø*Dm of DTE, DGS and DGM insert.

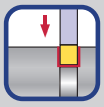
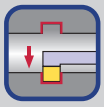
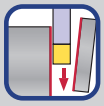
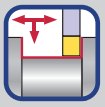
### SPARE PARTS

| Designation | Screw | Wrench |
|---|---|---|
| CAFR/L | BHM6-20-A | P-4 |

Tooling System

Inserts for CAER/L, CAFR/L → **C077 -**

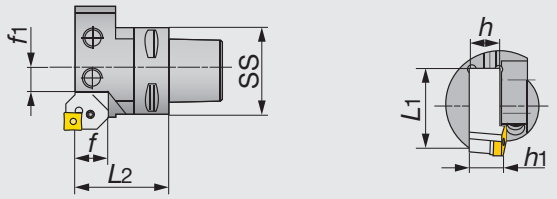
## INSERT APPLICATION

| Insert | Application | | | | | | |
|---|---|---|---|---|---|---|---|
| | Grooving | | | Parting | Turning | | |
| | External | Internal | Face | | External | Internal | Face |
| |  |  |  |  |  |  |  |
| DGM / SGM | ● | | ● | ● | | | |
| DGS / SGS | ● | | ● | ● | | | |
| DTE | ● | | ● | | ● | | ● |
| DGG | ● | | ● | | | | |
| DGE | ● | | | | | | |
| DTX | ● | ● | ● | ● | ● | ● | ● |
| DTI | | ● | | | | ● | |
| DGIM / DGIS | | ● | | | | | |
| DTF | | | ● | | | | ● |
| DTR | ● | | ● | | ● | | ● |
| DTIU | ● Undercutting | ● Undercutting | | | | | |
| DTA | | | | | ● Al wheel machining | ● Al wheel machining | |
| SGN | ● | | | | | | |

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## C-ADER/L

Adapter for square shank toolholders

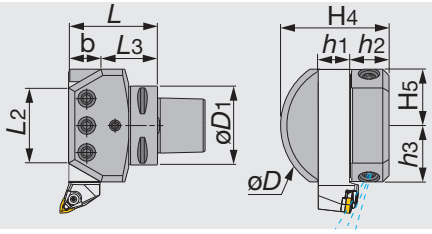



Left hand (L) shown.

| Designation | SS | $f_1$ | $L_2$ | $f$ | $h_1$ | $h$ | $L_1$ |
|---|---|---|---|---|---|---|---|
| C4ADE-20R/L | 40 | 8 | 49.2 | 20 | 20 | 20 | 57 |
| C5ADE-20R/L | 50 | 8 | 55.2 | 20 | 20 | 20 | 57 |

## C-ASHA

Adapters for square shank toolholders

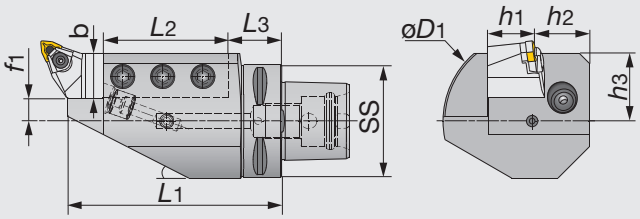



| Designation | $øD_1$ | $h_1$ | $b$ | $L$ | $L_2$ | $L_3$ | $h_3$ | $H_5$ | $h_2$ | $H_4$ | $øD$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C5ASHA20 | 50 | 20 | 20 | 58 | 46 | 38 | 38 | 38 | 31.5 | 76.5 | 90 |
| C6ASHA20 | 63 | 20 | 20 | 60 | 46 | 40 | 38 | 38 | 31.5 | 76.5 | 90 |
| C6ASHA25 | 63 | 25 | 25 | 71 | 61 | 46 | 45 | 45 | 31.6 | 86.5 | 110 |

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## C-ASHR/L

Adapter for square shank toolholders

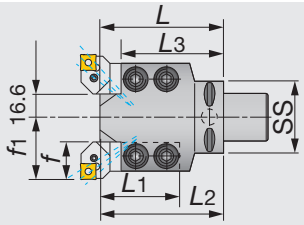


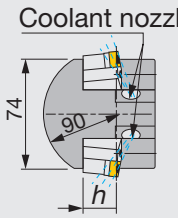

Left hand (L) shown.

| Designation | SS | $L_1$ | $L_2$ | $L_3$ | $f_1$ | $h_1$ | $b$ | $h_2$ | $h_3$ | $øD_1$ |
|---|---|---|---|---|---|---|---|---|---|---|
| C5ASHR/L201 | 50 | 98 | 63.5 | 24.5 | 10 | 20 | 20 | 33 | 30 | 90 |
| C6ASHR251-J | 63 | 120 | 82 | 38 | - | 25 | 25 | 31.5 | 29.5 | 90 |
| C6ASHL251 | 63 | 120 | 70 | 30 | 13 | 25 | 25 | 32 | 38 | 100 |
| C8ASHR/L32-1 | 80 | 140 | 95 | 35 | 8 | 32 | 32 | 32 | 40 | 110 |

## C-ADES

Adapters for square shank toolholders

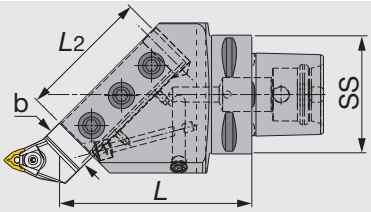


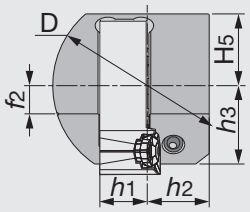




| Designation | SS | $f_1$ | $L_2$ | $L$ | $L_3$ | $h$ | $f$ | $L_1$ |
|---|---|---|---|---|---|---|---|---|
| C4ADES-20 | 40 | 41.6 | 98 | 85 | 71 | 20 | 25 | 67 |
| C5ADES-20 | 50 | 41.6 | 98 | 85 | 71 | 20 | 25 | 67 |

## C-ASHR/L-45

Adapters for square shank toolholder with 45° slanted




Left hand (L) shown.

| Designation | SS | $h_1$ | $b$ | $L_2$ | $L$ | $h_2$ | $h_3$ | $H_5$ | $f_2$ | D |
|---|---|---|---|---|---|---|---|---|---|---|
| C5ASHR/L20-45 | 50 | 20 | 20 | - | 127 | 26 | 36 | 31.5 | 15 | 72 |
| C6ASHR/L20-45 | 63 | 20 | 20 | 70 | 102 | 33 | 41.6 | 38 | 15 | 72 |
| C6ASHR/L25-45 | 63 | 25 | 25 | 70 | 102 | 33 | 41.6 | 38 | 15 | 100 |

## C-ABB

Adaptors for boring bars with sleeves

**Fig. 1**

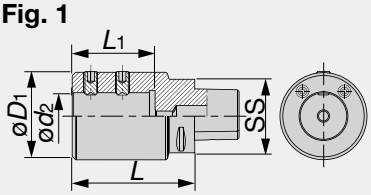



**Fig. 2**

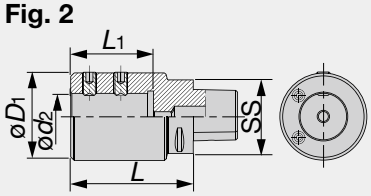
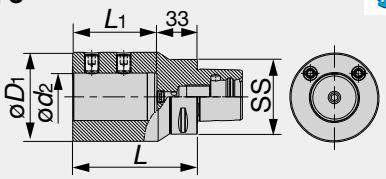



**Fig. 3**




| Designation | SS | ød2 | øD1 | L | L1 | Fig. |
|---|---|---|---|---|---|---|
| C5ABB-25-60 | 50 | 25 | 63 | 100 | 60 | 2 |
| C6ABB-25-60C* | 63 | 25 | 63 | 95 | 60 | 1 |
| C6ABB-40-70C* | 63 | 40 | 75 | 105 | 71 | 3 |
| C8ABB25-60 | 80 | 25 | 63 | 100 | 60 | 2 |
| C8ABB40-72 | 80 | 40 | 75 | 105 | 71 | 2 |

* Use the appropriate outlet screw according to the tool setup.
Applicable for 7 MPa pressure coolant

### SPARE PARTS

| Designation | Clamp screw | | Coolant outlet screw for internal supply | Coolant outlet screw for external supply |
|---|---|---|---|---|
| | Used on A-type sleeves | Used on B-type sleeves | | |
| C...ABB-25-60/C | SRM10X20DIN915 | SRM10X12DIN1835-B | SRM10X6DIN913 | SRM6X8DIN913 |
| C6ABB-40-70/C | SRM12X20DIN915 | SRM12X16DIN1835-B | SRM10X6DIN913 | SRM6X8DIN913 |
| C8ABB25-60 | SRM10X20DIN915 | SRM10X12DIN1835-B | SRM10X6DIN913 | - |
| C8ABB40-72 | SRM12X20DIN915 | SRM12X16DIN1835-B | SRM10X6DIN913 | - |

## SC

Sleeves for C-ABB adaptors

**Fig. A**

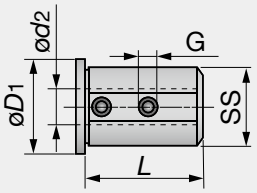
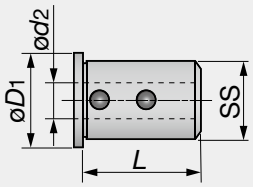



**Fig. B**

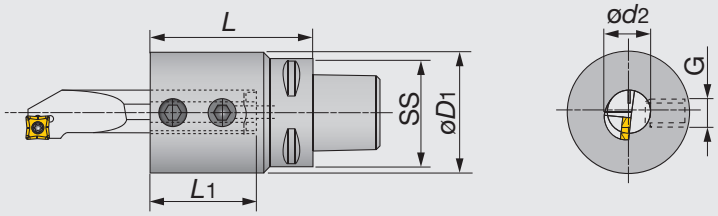



| Designation | SS | ød2 | øD1 | L | G | Fig. |
|---|---|---|---|---|---|---|
| SC25T6A | 25 | 6 | 31 | 56 | M6 | A |
| SC25T8A | 25 | 8 | 31 | 56 | M8 | A |
| SC25T10A | 25 | 10 | 31 | 56 | M8 | A |
| SC25T12A | 25 | 12 | 31 | 56 | M8 | A |
| SC25T16B | 25 | 16 | 31 | 56 | - | B |
| SC25T20B | 25 | 20 | 31 | 56 | - | B |
| SC40T6A | 40 | 6 | 46 | 58 | M6 | A |
| SC40T8A | 40 | 8 | 46 | 58 | M6 | A |
| SC40T10A | 40 | 10 | 46 | 58 | M8 | A |
| SC40T12A | 40 | 12 | 46 | 58 | M8 | A |
| SC40T16B | 40 | 16 | 46 | 58 | - | B |
| SC40T20B | 40 | 20 | 46 | 58 | - | B |
| SC40T25B | 40 | 25 | 46 | 58 | - | B |
| SC40T32B | 40 | 32 | 46 | 58 | - | B |

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## C-ADI

Adaptors for boring bars

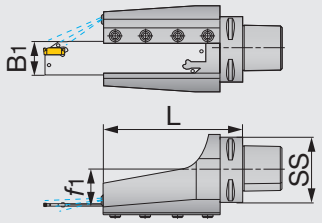



| Designation | SS | *L* | $L_1$ | $ød_2$ | $øD_1$ | G |
|---|---|---|---|---|---|---|
| C4ADI10 | 40 | 50 | 20 | 10 | 36 | M6 |
| C4ADI12 | 40 | 50 | 24 | 12 | 36 | M8 |
| C4ADI16 | 40 | 50 | 32 | 16 | 36 | M8 |
| C4ADI20 | 40 | 60 | 35 | 20 | 36 | M10 |
| C4ADI25 | 40 | 70 | 45 | 25 | 54 | M12 |
| C5ADI10 | 50 | 60 | 26 | 10 | 36 | M6 |
| C5ADI12 | 50 | 60 | 26 | 12 | 36 | M8 |
| C5ADI16 | 50 | 60 | 32 | 16 | 36 | M8 |
| C5ADI20 | 50 | 75 | 49 | 20 | 55 | M12 |
| C5ADI25 | 50 | 85 | 60 | 25 | 60 | M12 |
| C5ADI32 | 50 | 100 | 76 | 32 | 68 | M12 |
| C6ADI12 | 60 | 65 | 36 | 12 | 36 | M8 |
| C6ADI16 | 60 | 65 | 36 | 16 | 36 | M8 |
| C6ADI20 | 60 | 65 | 40 | 20 | 36 | M10 |
| C6ADI25 | 60 | 76 | 51 | 25 | 54 | M12 |
| C6ADI32 | 60 | 100 | 76 | 32 | 68 | M12 |
| C6ADI40 | 60 | 100 | 76 | 40 | 98 | M12 |
| C6ADI50 | 60 | 115 | 76 | 50 | 98 | M12 |
| C8ADI12 | 80 | 70 | 36 | 12 | 36 | M8 |
| C8ADI16 | 80 | 70 | 36 | 16 | 36 | M8 |
| C8ADI20 | 80 | 70 | 40 | 20 | 36 | M10 |
| C8ADI25 | 80 | 80 | 51 | 25 | 54 | M12 |
| C8ADI32 | 80 | 110 | 86 | 32 | 68 | M12 |
| C8ADI40 | 80 | 115 | 86 | 40 | 98 | M12 |
| C8ADI50 | 80 | 115 | 86 | 50 | 98 | M12 |

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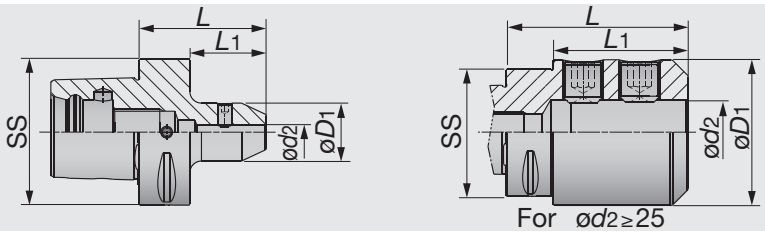
## C-TBK-R/L

Adaptors for parting and grooving blades



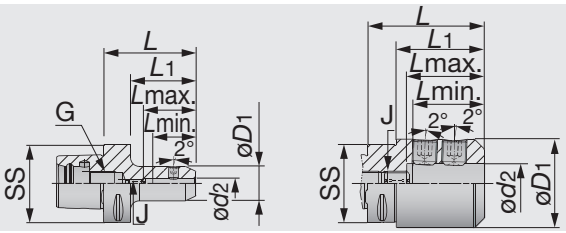

| Designation | SS | f1 | *L* | $B_1$ |
|---|---|---|---|---|
| C6TBK-32R/L | 63 | 32 | 138 | 32 |
| C8TBK-32R | 80 | 40.5 | 147 | 32 |
| C8TBK-52R | 80 | 40.5 | 161 | 52 |

## Weldon endmill holders (DIN1835 Form B)



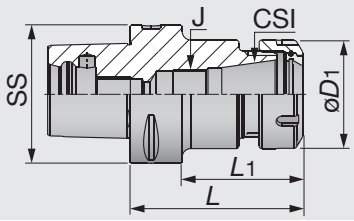

| Designation | SS | ød2 | øD1 | L | L1 |
|---|---|---|---|---|---|
| C4EM06X50 | 40 | 6 | 25 | 50 | 30 |
| C4EM08X50 | 40 | 8 | 28 | 50 | 30 |
| C4EM10X50 | 40 | 10 | 35 | 50 | 30 |
| C4EM12X55 | 40 | 12 | 42 | 55 | 35 |
| C4EM14X55 | 40 | 14 | 44 | 55 | 35 |
| C4EM16X60 | 40 | 16 | 48 | 60 | 40 |
| C5EM06X50 | 50 | 6 | 25 | 50 | 30 |
| C5EM08X50 | 50 | 8 | 28 | 50 | 30 |
| C5EM10X55 | 50 | 10 | 35 | 55 | 35 |
| C5EM12X60 | 50 | 12 | 42 | 60 | 40 |
| C5EM14X60 | 50 | 14 | 44 | 60 | 40 |
| C5EM16X60 | 50 | 16 | 48 | 60 | 40 |
| C5EM18X60 | 50 | 18 | 50 | 60 | 40 |
| C5EM20X60 | 50 | 20 | 52 | 60 | 40 |
| C5EM25X85 | 50 | 25 | 65 | 85 | 65 |
| C6EM6X55 | 63 | 6 | 25 | 55 | 33 |
| C6EM8X55 | 63 | 8 | 28 | 55 | 33 |
| C6EM10X60 | 63 | 10 | 35 | 60 | 38 |
| C6EM12X60 | 63 | 12 | 42 | 60 | 38 |
| C6EM14X60 | 63 | 14 | 44 | 60 | 38 |
| C6EM16X65 | 63 | 16 | 48 | 65 | 43 |
| C6EM18X65 | 63 | 18 | 50 | 65 | 43 |
| C6EM20X65 | 63 | 20 | 52 | 65 | 43 |
| C6EM25X80 | 63 | 25 | 65 | 80 | 58 |
| C6EM32X90 | 63 | 32 | 72 | 90 | 68 |
| C6EM40X100 | 63 | 40 | 90 | 100 | 78 |
| C8EM06X70 | 80 | 6 | 25 | 70 | 40 |
| C8EM08X70 | 80 | 8 | 28 | 70 | 40 |
| C8EM10X70 | 80 | 10 | 35 | 70 | 40 |
| C8EM12X70 | 80 | 12 | 42 | 70 | 40 |
| C8EM14X70 | 80 | 14 | 44 | 70 | 40 |
| C8EM16X70 | 80 | 16 | 48 | 70 | 40 |
| C8EM18X70 | 80 | 18 | 50 | 70 | 40 |
| C8EM20X70 | 80 | 20 | 52 | 70 | 40 |
| C8EM25X90 | 80 | 25 | 65 | 90 | 60 |
| C8EM32X95 | 80 | 32 | 72 | 95 | 65 |
| C8EM40X110 | 80 | 40 | 90 | 110 | 80 |
| C8EM50X120 | 80 | 50 | 98 | 120 | 90 |

## Drill holders (DIN1835 Form E - whistle notch)




| Designation | SS | ød2 | øD1 | L | Lmin | Lmax | L1 | J | G |
|---|---|---|---|---|---|---|---|---|---|
| C4EM06X70E | 40 | 6 | 25 | 70 | 30 | 35 | 50 | M5 | M14 |
| C4EM08X70E | 40 | 8 | 28 | 70 | 35 | 43 | 50 | M6 | M14 |
| C4EM10X70E | 40 | 10 | 35 | 70 | 39 | 45 | 50 | M8 | M14 |
| C4EM12X75E | 40 | 12 | 42 | 75 | 44 | 49 | 55 | M10 | M14 |
| C4EM14X75E | 40 | 14 | 44 | 75 | 44 | 49 | 55 | M10 | M14 |
| C5EM06X70E | 50 | 6 | 25 | 70 | 30 | 35 | 50 | M5 | M16 |
| C5EM08X70E | 50 | 8 | 28 | 70 | 35 | 43 | 50 | M6 | M16 |
| C5EM10X70E | 50 | 10 | 35 | 70 | 39 | 45 | 50 | M8 | M16 |
| C5EM12X75E | 50 | 12 | 42 | 75 | 44 | 49 | 55 | M10 | M16 |
| C5EM14X75E | 50 | 14 | 44 | 75 | 44 | 49 | 55 | M10 | M16 |
| C5EM16X80E | 50 | 16 | 48 | 80 | 47 | 52 | 60 | M12 | M16 |
| C5EM18X80E | 50 | 18 | 50 | 80 | 47 | 52 | 60 | M12 | M16 |
| C5EM20X85E | 50 | 20 | 52 | 85 | 49 | 55 | 65 | M16 | M16 |
| C6EM06X75E | 63 | 6 | 25 | 75 | 30 | 36 | 53 | M5 | M20 |
| C6EM08X75E | 63 | 8 | 28 | 75 | 35 | 43 | 53 | M6 | M20 |
| C6EM10X75E | 63 | 10 | 35 | 75 | 39 | 46 | 53 | M8 | M20 |
| C6EM12X80E | 63 | 12 | 42 | 80 | 44 | 49 | 58 | M10 | M20 |
| C6EM14X80E | 63 | 14 | 44 | 80 | 44 | 49 | 58 | M10 | M20 |
| C6EM16X85E | 63 | 16 | 48 | 85 | 47 | 52 | 63 | M12 | M20 |
| C6EM18X85E | 63 | 18 | 50 | 85 | 47 | 52 | 63 | M12 | M20 |
| C6EM20X85E | 63 | 20 | 52 | 85 | 49 | 55 | 63 | M16 | M20 |
| C6EM25X90E | 63 | 25 | 65 | 90 | 54 | 60 | 68 | M20 | M20 |
| C6EM32X95E | 63 | 32 | 72 | 95 | 58 | 63 | 73 | M20 | M20 |
| C8EM06X65E | 80 | 6 | 25 | 65 | 30 | 36 | 35 | M5 | M20 |
| C8EM08X65E | 80 | 8 | 28 | 65 | 35 | 43 | 35 | M6 | M20 |
| C8EM10X65E | 80 | 10 | 35 | 65 | 39 | 46 | 35 | M8 | M20 |
| C8EM12X70E | 80 | 12 | 42 | 70 | 44 | 49 | 40 | M10 | M20 |
| C8EM14X70E | 80 | 14 | 44 | 70 | 44 | 49 | 40 | M10 | M20 |
| C8EM16X75E | 80 | 16 | 48 | 75 | 47 | 52 | 45 | M12 | M20 |
| C8EM18X75E | 80 | 18 | 50 | 75 | 47 | 52 | 45 | M12 | M20 |
| C8EM20X80E | 80 | 20 | 52 | 80 | 49 | 57 | 50 | M16 | M20 |
| C8EM25X90E | 80 | 25 | 65 | 90 | 54 | 60 | 60 | M20 | M20 |
| C8EM32X95E | 80 | 32 | 72 | 95 | 58 | 64 | 65 | M20 | M20 |

## ER collet chucks holders (DIN 6499)




| Designation | Range | SS | CSI | øD1 | L | L1 | J |
|---|---|---|---|---|---|---|---|
| C4ER16X70 | 1-10 | 40 | ER16 | 28 | 70 | 50 | M10 |
| C4ER20X35* | 1-13 | 40 | ER20 | 34 | 35 | 27 | - |
| C4ER20X52 | 1-13 | 40 | ER20 | 34 | 52 | 32 | - |
| C4ER25X38* | 1-16 | 40 | ER25 | 42 | 38 | 30 | - |
| C4ER25X52 | 1-16 | 40 | ER25 | 42 | 52 | 32 | - |
| C4ER32X54 | 2-20 | 40 | ER32 | 50 | 54 | 34 | - |
| C5ER16X100 | 1-10 | 50 | ER16 | 28 | 100 | 80 | M10 |
| C5ER16X130 | 1-10 | 50 | ER16 | 28 | 130 | 120 | M10 |
| C5ER20X055 | 1-13 | 50 | ER20 | 34 | 55 | 35 | - |
| C5ER20X100 | 1-13 | 50 | ER20 | 34 | 100 | 80 | M12 |
| C5ER20X130 | 1-13 | 50 | ER20 | 34 | 130 | 120 | M12 |
| C5ER25X055 | 1-16 | 50 | ER25 | 42 | 55 | 35 | - |
| C5ER25X100 | 1-16 | 50 | ER25 | 42 | 100 | 80 | M16 |
| C5ER32X057 | 2-20 | 50 | ER32 | 50 | 57 | 36 | - |
| C5ER32X100 | 2-20 | 50 | ER32 | 50 | 100 | 80 | M22X1.5 |
| C6ER16X100 | 1-10 | 63 | ER16 | 28 | 100 | 78 | M10 |
| C6ER16X130 | 1-10 | 63 | ER16 | 28 | 130 | 108 | M10 |
| C6ER16X160 | 1-10 | 63 | ER16 | 28 | 160 | 138 | M10 |
| C6ER20X060 | 1-13 | 63 | ER20 | 34 | 60 | 38 | - |
| C6ER20X100 | 1-13 | 63 | ER20 | 34 | 100 | 78 | M12 |
| C6ER20X130 | 1-13 | 63 | ER20 | 34 | 130 | 108 | M12 |
| C6ER20X160 | 1-13 | 63 | ER20 | 34 | 160 | 138 | M12 |
| C6ER25X060 | 1-16 | 63 | ER25 | 42 | 60 | 38 | - |
| C6ER25X100 | 1-16 | 63 | ER25 | 42 | 100 | 78 | M16 |
| C6ER25X130 | 1-16 | 63 | ER25 | 42 | 130 | 108 | M16 |
| C6ER25X160 | 1-16 | 63 | ER25 | 42 | 160 | 138 | M16 |
| C6ER32X060 | 2-20 | 63 | ER32 | 50 | 60 | 36 | - |
| C6ER32X100 | 2-20 | 63 | ER32 | 50 | 100 | 78 | M22X1.5 |
| C6ER32X130 | 2-20 | 63 | ER32 | 50 | 130 | 108 | M22X1.5 |
| C6ER32X160 | 2-20 | 63 | ER32 | 50 | 160 | 138 | M22X1.5 |
| C6ER40X065 | 3-26 | 63 | ER40 | 63 | 65 | 37 | - |
| C6ER40X100 | 3-26 | 63 | ER40 | 63 | 100 | 78 | M28X1.5 |
| C6ER40X130 | 3-26 | 63 | ER40 | 63 | 130 | 108 | M28X1.5 |
| C8ER32X70 | 2-20 | 80 | ER32 | 50 | 70 | 40 | - |
| C8ER32X100 | 2-20 | 80 | ER32 | 50 | 100 | 70 | M22X1.5 |
| C8ER32X160 | 2-20 | 80 | ER32 | 50 | 160 | 130 | M22X1.5 |
| C8ER40X70 | 3-26 | 80 | ER40 | 63 | 70 | 40 | - |
| C8ER40X100 | 3-26 | 80 | ER40 | 63 | 100 | 70 | M28X1.5 |
| C8ER40X160 | 3-26 | 80 | ER40 | 63 | 160 | 130 | M28X1.5 |

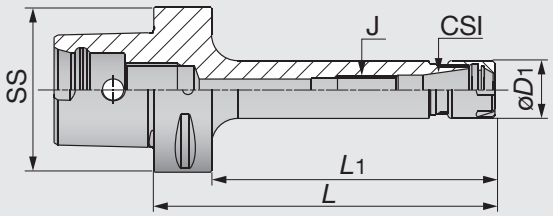
Wrench is not included.
*Without V grooves, for manual use only.

(Option:Wrench for ER collet)

TUNGCAP

## C-ER-M

Mini ER collet chucks holders (DIN 6499)



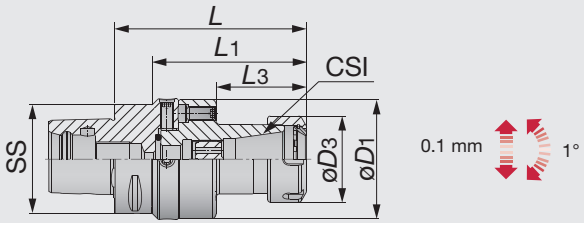

| Designation | Range | SS | CSI | øD1 | L | L1 | J |
|---|---|---|---|---|---|---|---|
| C4ER16X70M | 0.5-10 | 40 | ER16 | 22 | 70 | 50 | M10 |
| C5ER16X100M | 0.5-10 | 50 | ER16 | 22 | 100 | 80 | M10 |
| C5ER16X130M | 0.5-10 | 50 | ER16 | 22 | 130 | 120 | M10 |
| C6ER16X100M | 0.5-10 | 63 | ER16 | 22 | 100 | 78 | M10 |
| C6ER16X130M | 0.5-10 | 63 | ER16 | 22 | 130 | 108 | M10 |
| C6ER16X160M | 0.5-10 | 63 | ER16 | 22 | 160 | 138 | M10 |

(Option:Wrench for ER collet)

TUNGCAP

## ADJ C-ER

ER collet chucks with center alignment




| Designation | SS | CSI | Range | øD1 | øD3 | L | L1 | L3 |
|---|---|---|---|---|---|---|---|---|
| ADJC5ER32 | 50 | ER32 | 2-20 | 70 | 50 | 115 | 95 | 52.5 |
| ADJC6ER32 | 63 | ER32 | 2-20 | 70 | 50 | 111.5 | 89.5 | 52.5 |

(Option:Wrench for ER collet)

## WRENCH-ER / ER DIN 6499

**Fig. 1**

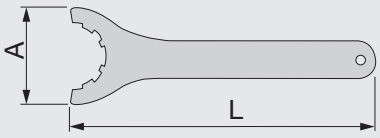



**Fig. 2**

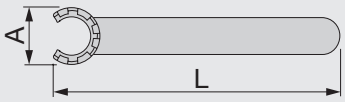
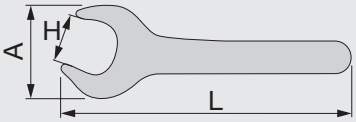



**Fig. 3**




| Designation | A | H | L | Fig. |
|---|---|---|---|---|
| WRENCHER11MINI | 16.8 | - | 95 | 2 |
| WRENCHER11 | 32 | 17 | 95 | 3 |
| WRENCHER16MINI | 22.5 | - | 117 | 2 |
| WRENCHER16 | 42.8 | 25 | 143 | 3 |
| WRENCHER20MINI | 28 | - | 128 | 2 |
| WRENCHER20 | 53.5 | 30 | 172 | 3 |
| WRENCHER25MINI | 29 | - | 120 | 2 |
| WRENCHER25 | 70 | - | 207 | 1 |
| WRENCHER32 | 78 | - | 255 | 1 |
| WRENCHER40 | 95 | - | 285 | 1 |
| WRENCHER50 | 110 | - | 350 | 1 |
| WRENCHER20SHORTRING22 | 48 | 22 | 260 | 3 |
| WRENCHER32SHORT | 75 | 36 | 303 | 3 |
| WRENCHER40SHORT | 94 | 46 | 378 | 3 |

## PRESET ER-JET (Preset screws)

**Fig. 1**

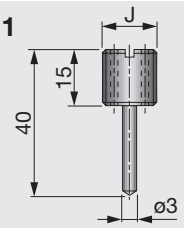
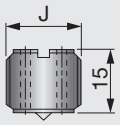
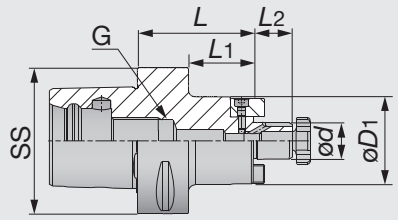



**Fig. 2**




| Designation | J | Fig. |
|---|---|---|
| PRESETER-JET8X1 | M8X1.0 | 2 |
| PRESETER-JET8X1.25 | M8X1.25 | 2 |
| PRESETER-JET10X1.5 | M10X1.5 | 2 |
| PRESETER-JET12X1 | M12X1.0 | 2 |
| PRESETER-JET12X1.75L | M12X1.75 | 1 |
| PRESETER-JET12X1.75 | M12X1.75 | 2 |
| PRESETER-JET14X1 | M14X1.0 | 2 |
| PRESETER-JET16X2 | M16X2 | 2 |
| PRESETER-JET16X2L | M16X2 | 1 |
| PRESETER-JET18X1 | M18X1.0 | 2 |
| PRESETER-JET18X1.5 | M18X1.5 | 2 |
| PRESETER-JET18X1.5L | M18X1.5 | 1 |
| PRESETER-JET22X1.5 | M22X1.5 | 2 |
| PRESETER-JET22X1.5L | M22X1.5 | 1 |
| PRESETER-JET28X1.5 | M28X1.5 | 2 |

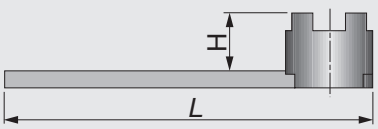
## Shell mill holders (with coolant nozzle)




| Designation | SS | ød | øD1 | L | L2 | L1 | G |
|---|---|---|---|---|---|---|---|
| C4SEM16X32C | 40 | 16 | 38 | 32 | 12 | 17 | M14 |
| C4SEM16X55C | 40 | 16 | 38 | 55 | 35 | 17 | M14 |
| C4SEM22X40C | 40 | 22 | 47 | 40 | 20 | 19 | M14 |
| C4SEM22X55C | 40 | 22 | 47 | 55 | 35 | 19 | M14 |
| C5SEM16X35C | 50 | 16 | 38 | 35 | 17 | 15 | M16 |
| C5SEM16X70C | 50 | 16 | 38 | 70 | 17 | 50 | M16 |
| C5SEM22X35C | 50 | 22 | 47 | 35 | 19 | 15 | M16 |
| C5SEM22X70C | 50 | 22 | 47 | 70 | 19 | 50 | M16 |
| C5SEM25.4X37C | 50 | 25.4 | 50 | 37 | 22 | - | M16 |
| C5SEM27X40C | 50 | 27 | 58 | 40 | 21 | 20 | M16 |
| C5SEM31.75X60C | 50 | 31.75 | 64 | 60 | 30 | - | M16 |
| C5SEM32X40C | 50 | 32 | 63 | 40 | 24 | 20 | M16 |
| C6SEM16X50C | 63 | 16 | 38 | 50 | 17 | 28 | M20 |
| C6SEM16X100C | 63 | 16 | 38 | 100 | 17 | 78 | M20 |
| C6SEM22X50C | 63 | 22 | 47 | 50 | 19 | 28 | M20 |
| C6SEM22X100C | 63 | 22 | 47 | 100 | 19 | 78 | M20 |
| C6SEM25.4X37C | 63 | 25.4 | 50 | 37 | 22 | - | M20 |
| C6SEM27X60C | 63 | 27 | 58 | 60 | 21 | 38 | M20 |
| C6SEM27X100C | 63 | 27 | 58 | 100 | 21 | 78 | M20 |
| C6SEM31.75X60C | 63 | 31.75 | 64 | 60 | 30 | - | M20 |
| C6SEM32X60C | 63 | 32 | 66 | 60 | 24 | 38 | M20 |
| C6SEM38.1X60C | 63 | 38.1 | 80 | 60 | 34 | - | M20 |
| C6SEM40X60C | 63 | 40 | 82 | 60 | 27 | 38 | M20 |
| C8SEM16X50C | 80 | 16 | 38 | 50 | 20 | 17 | M20 |
| C8SEM16X100C | 80 | 16 | 38 | 100 | 70 | 17 | M20 |
| C8SEM22X50C | 80 | 22 | 47 | 50 | 20 | 19 | M20 |
| C8SEM22X100C | 80 | 22 | 47 | 100 | 70 | 19 | M20 |
| C8SEM25.4X50C | 80 | 25.4 | 50 | 50 | 22 | 20 | M20 |
| C8SEM27X50C | 80 | 27 | 58 | 50 | 20 | 21 | M20 |
| C8SEM27X100C | 80 | 27 | 58 | 100 | 70 | 21 | M20 |
| C8SEM31.75X50C | 80 | 31.75 | 64 | 50 | 30 | 20 | M20 |
| C8SEM32X50C | 80 | 32 | 66 | 50 | 20 | 24 | M20 |
| C8SEM32X100C | 80 | 32 | 66 | 100 | 70 | 24 | M20 |
| C8SEM38.1X50C | 80 | 38.1 | 80 | 50 | 34 | - | M20 |
| C8SEM40X60C | 80 | 40 | 82 | 60 | 30 | 27 | M20 |

(Option:Wrench for lock Screw)

## WRENCH SEM / DIN6368

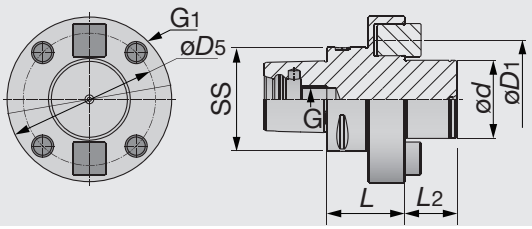



| Designation | Inner diameter of cutter body ø | Screw size | H | L |
|---|---|---|---|---|
| WRENCHM8SEMC16 | 16 | M8 | 20 | 180 |
| WRENCHM10SEMC22 | 22 | M10 | 25 | 200 |
| WRENCHM12SEMC27 | 25.4 / 27 | M12 | 32 | 225 |
| WRENCHM16SEMC32 | 31.75 / 32 | M16 | 36 | 250 |
| WRENCHM20SEMC40 | 38.1 / 40 | M20 | 40 | 280 |
| WRENCHM24SEMC50 | 50 | M24 | 50 | 315 |

# TUNGCAP

## C-FM

Face mill holders

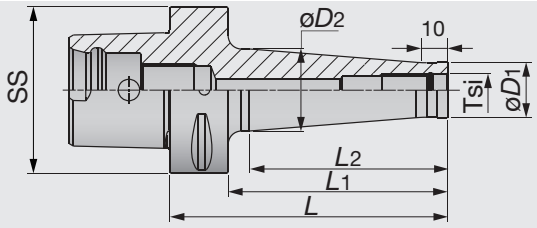



| Designation | SS | ød | L2 | L | øD1 | øD5 | G1 | G |
|---|---|---|---|---|---|---|---|---|
| C8FM60X60 | 80 | 60 | 20 | 40 | 128 | 101.6 | M16 | M20 |

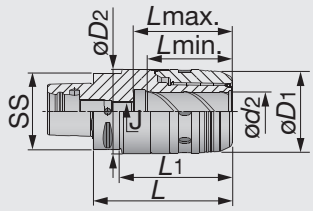
# TUNGFLEX

## C-ODP

TungFlex modular tooling system (Screw clamping head holder)




| Designation | Tsi | SS | øD1 | øD2 | L | L1 | L3 |
|---|---|---|---|---|---|---|---|
| C4ODP10X53 | M10 | 40 | 18 | 23 | 53 | 33 | 23 |
| C4ODP12X53 | M12 | 40 | 21 | 26 | 53 | 33 | 23 |
| C4ODP16X53 | M16 | 40 | 29 | 34 | 53 | 33 | 23 |
| C5ODP10X53 | M10 | 50 | 18 | 19.5 | 53 | 33 | 25 |
| C5ODP10X103 | M10 | 50 | 18 | 28 | 103 | 83 | 75 |
| C5ODP12X53 | M12 | 50 | 21 | 23.5 | 53 | 33 | 25 |
| C5ODP12X103 | M12 | 50 | 21 | 31 | 103 | 83 | 75 |
| C5ODP16X53 | M16 | 50 | 29 | 34 | 53 | 33 | 25 |
| C5ODP16X103 | M16 | 50 | 29 | 36 | 103 | 83 | 75 |
| C6ODP10X55 | M10 | 63 | 18 | 19.5 | 55 | 33 | 25 |
| C6ODP10X105 | M10 | 63 | 18 | 28 | 105 | 83 | 75 |
| C6ODP10X130 | M10 | 63 | 18 | 32 | 130 | 108 | 100 |
| C6ODP12X55 | M12 | 63 | 21 | 23.5 | 55 | 33 | 25 |
| C6ODP12X105 | M12 | 63 | 21 | 31 | 105 | 83 | 75 |
| C6ODP12X130 | M12 | 63 | 21 | 36 | 130 | 108 | 100 |
| C6ODP16X55 | M16 | 63 | 29 | 34 | 55 | 33 | 25 |
| C6ODP16X105 | M16 | 63 | 29 | 34 | 105 | 83 | 75 |
| C6ODP16X130 | M16 | 63 | 29 | 41 | 130 | 108 | 100 |

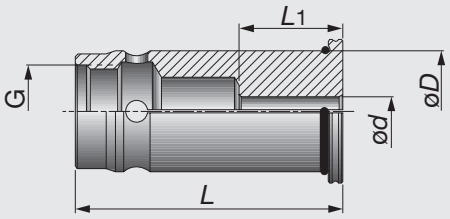



| Designation | SS | Range | ød2 | øD1 | øD2 | L | L1 | Lmin | Lmax | J |
|---|---|---|---|---|---|---|---|---|---|---|
| C5MAXIN20X100 | 50 | 6-20 | 20 | 51 | 53 | 100 | 75 | 55 | 67 | M16 |
| C6MAXIN20X95 | 63 | 6-20 | 20 | 51 | 53 | 95 | 73 | 55 | 67 | M16 |
| C6MAXIN32X115 | 63 | 6-32 | 32 | 69 | 70 | 115 | 93 | 70 | 82 | M16 |
| C8MAXIN20X95 | 80 | 6-20 | 20 | 51 | 53 | 95 | 65 | 55 | 67 | M16 |
| C8MAXIN32X115 | 80 | 6-32 | 32 | 69 | 70 | 115 | 85 | 70 | 82 | M16 |

(Option : Wrench for TungMax collet)

## SC-SEAL

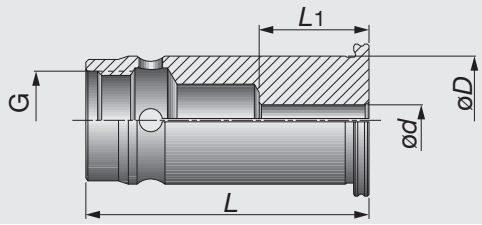
SC sealed straight collets - metric




| Designation | ød | øD | L | L1 | G |
|---|---|---|---|---|---|
| SC20SEAL6 | 6 | 20 | 60 | 28 | M16 |
| SC20SEAL8 | 8 | 20 | 60 | 28 | M16 |
| SC20SEAL10 | 10 | 20 | 60 | 35 | M16 |
| SC20SEAL12 | 12 | 20 | 60 | 40 | M16 |
| SC20SEAL14 | 14 | 20 | 60 | 40 | M16 |
| SC20SEAL15 | 15 | 20 | 60 | 40 | M16 |
| SC20SEAL16 | 16 | 20 | 60 | 39 | M16 |
| SC32SEAL6 | 6 | 32 | 72 | 28 | M24x1.5 |
| SC32SEAL8 | 8 | 32 | 72 | 28 | M24x1.5 |
| SC32SEAL10 | 10 | 32 | 72 | 35 | M24x1.5 |
| SC32SEAL12 | 12 | 32 | 72 | 40 | M24x1.5 |
| SC32SEAL14 | 14 | 32 | 72 | 40 | M24x1.5 |
| SC32SEAL15 | 15 | 32 | 72 | 40 | M24x1.5 |
| SC32SEAL16 | 16 | 32 | 72 | 44 | M24x1.5 |
| SC32SEAL18 | 18 | 32 | 72 | 44 | M24x1.5 |
| SC32SEAL19 | 19 | 32 | 72 | 44 | M24x1.5 |
| SC32SEAL20 | 20 | 32 | 72 | 46 | M24x1.5 |
| SC32SEAL24 | 24 | 32 | 72 | 46 | M24x1.5 |
| SC32SEAL25 | 25 | 32 | 72 | 51 | M24x1.5 |

## SC-SPR

SC straight collets - metric




| Designation | ød | øD | L | L1 | G |
|---|---|---|---|---|---|
| SC20SPR6 | 6 | 20 | 60 | 28 | M16 |
| SC20SPR8 | 8 | 20 | 60 | 28 | M16 |
| SC20SPR10 | 10 | 20 | 60 | 35 | M16 |
| SC20SPR12 | 12 | 20 | 60 | 40 | M16 |
| SC20SPR14 | 14 | 20 | 60 | 40 | M16 |
| SC20SPR15 | 15 | 20 | 60 | 40 | M16 |
| SC20SPR16 | 16 | 20 | 60 | 39 | M16 |
| SC32SPR6 | 6 | 32 | 72 | 28 | M24x1.5 |
| SC32SPR8 | 8 | 32 | 72 | 28 | M24x1.5 |
| SC32SPR10 | 10 | 32 | 72 | 35 | M24x1.5 |
| SC32SPR12 | 12 | 32 | 72 | 40 | M24x1.5 |
| SC32SPR14 | 14 | 32 | 72 | 40 | M24x1.5 |
| SC32SPR15 | 15 | 32 | 72 | 40 | M24x1.5 |
| SC32SPR16 | 16 | 32 | 72 | 44 | M24x1.5 |
| SC32SPR18 | 18 | 32 | 72 | 44 | M24x1.5 |
| SC32SPR19 | 19 | 32 | 72 | 44 | M24x1.5 |
| SC32SPR20 | 20 | 32 | 72 | 46 | M24x1.5 |
| SC32SPR24 | 84 | 32 | 72 | 45 | M24x1.5 |
| SC32SPR25 | 25 | 32 | 72 | 51 | M24x1.5 |

## PRESET SC CAP

Preset screw for SC collets

**Fig. 1**

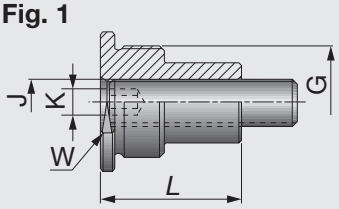
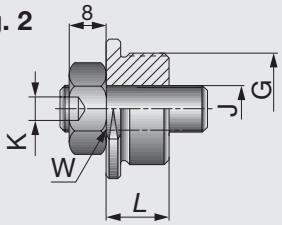
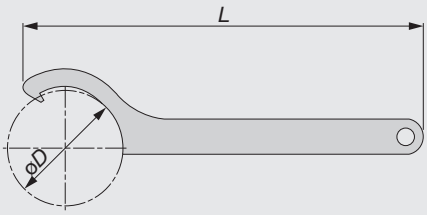



**Fig. 2**



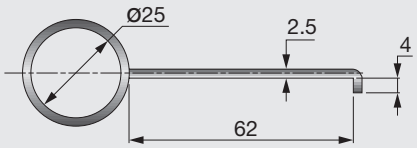

| Designation | L | W | J | G | Fig | Range | key | CSI |
|---|---|---|---|---|---|---|---|---|
| PRESETSCCAP8x1.25L | 28 | 16 | M8X25 | M16 | 1 | 6-8 | 4 | SC20 |
| PRESETSCCAP8x1.25 | 15 | 16 | M8X25 | M16 | 2 | 10-16 | 4 | SC20 |
| PRESETSCCAP10x1.5L | 30 | 27 | M10X30 | M24X1.5 | 1 | 6-14 | 5 | SC32 |
| PRESETSCCAP10x1.5 | 13.5 | 27 | M10X30 | M24X1.5 | 2 | 16-25 | 5 | SC32 |

## Wrench



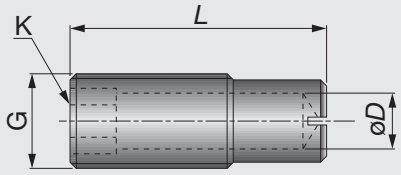

| Designation | øD | L |
|---|---|---|
| WRENCHMAXIN20HOOK | 26 | 16 |
| WRENCHMAXIN32HOOK | 68 | 16 |

## SC collet extracting hook




| Designation |
|---|
| EXTRACTORSCCOLLETS |

## Preset screws

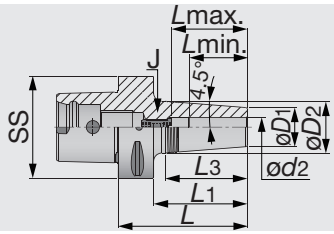



| Designation | G | L | øD | K |
|---|---|---|---|---|
| PRESETMAXIN16X30 | M16 | 30 | 8 | 8 |
| PRESETMAXIN16X44 | M16 | 44 | 8 | 8 |
| PRESETMAXIN20X55 | M20 | 55 | 12 | 12 |

TUNGSHRINK

## C-SRKIN

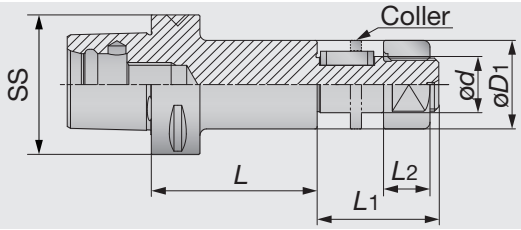
Thermal shrinking holders




| Designation | SS | ød2 | øD1 | øD2 | L | L1 | L3 | Lmin | Lmax | J |
|---|---|---|---|---|---|---|---|---|---|---|
| C4SRKIN6X75 | 40 | 6 | 21 | 27 | 75 | 55 | 38.1 | 25 | 36 | M5 |
| C4SRKIN8X75 | 40 | 8 | 21 | 27 | 75 | 55 | 38.1 | 25 | 36 | M6 |
| C4SRKIN10X75 | 40 | 10 | 24 | 32 | 75 | 55 | 50.8 | 31 | 42 | M8 |
| C4SRKIN12X75 | 40 | 12 | 24 | 32 | 75 | 55 | 50.8 | 36 | 47 | M10 |
| C4SRKIN14X80 | 40 | 14 | 27 | 34 | 80 | 60 | 44.5 | 36 | 47 | M10 |
| C4SRKIN16X80 | 40 | 16 | 27 | 34 | 80 | 60 | 44.5 | 39 | 50 | M12 |
| C4SRKIN18X80 | 40 | 18 | 33 | 42 | 80 | 60 | 57.2 | 39 | 50 | M12 |
| C4SRKIN20X85 | 40 | 20 | 33 | 42 | 85 | 65 | 57.2 | 41 | 52 | M16 |
| C5SRKIN6X75 | 50 | 6 | 21 | 27 | 75 | 55 | 38.1 | 25 | 36 | M5 |
| C5SRKIN8X75 | 50 | 8 | 21 | 27 | 75 | 55 | 38.1 | 25 | 36 | M6 |
| C5SRKIN10X75 | 50 | 10 | 24 | 32 | 75 | 55 | 51.3 | 31 | 42 | M8 |
| C5SRKIN12X75 | 50 | 12 | 24 | 32 | 75 | 55 | 51.3 | 36 | 47 | M10 |
| C5SRKIN14X80 | 50 | 14 | 27 | 34 | 80 | 60 | 44.5 | 36 | 47 | M10 |
| C5SRKIN16X80 | 50 | 16 | 27 | 34 | 80 | 60 | 44.5 | 39 | 50 | M12 |
| C5SRKIN18X80 | 50 | 18 | 33 | 42 | 80 | 60 | 57.2 | 39 | 50 | M12 |
| C5SRKIN20X85 | 50 | 20 | 33 | 42 | 85 | 65 | 57.2 | 41 | 52 | M16 |
| C5SRKIN25X90 | 50 | 25 | 44 | 53 | 90 | 70 | 57.2 | 47 | 58 | M16 |
| C6SRKIN6X80 | 63 | 6 | 21 | 27 | 80 | 58 | 38.1 | 25 | 36 | M5 |
| C6SRKIN8X80 | 63 | 8 | 21 | 27 | 80 | 58 | 38.1 | 25 | 36 | M6 |
| C6SRKIN10X80 | 63 | 10 | 24 | 32 | 80 | 58 | 50.8 | 31 | 42 | M8 |
| C6SRKIN12X80 | 63 | 12 | 24 | 32 | 80 | 58 | 50.8 | 36 | 47 | M10 |
| C6SRKIN14X85 | 63 | 14 | 27 | 34 | 85 | 63 | 44.5 | 36 | 47 | M10 |
| C6SRKIN16X85 | 63 | 16 | 27 | 34 | 85 | 63 | 44.5 | 39 | 50 | M12 |
| C6SRKIN18X85 | 63 | 18 | 33 | 42 | 85 | 63 | 57.2 | 39 | 50 | M12 |
| C6SRKIN20X85 | 63 | 20 | 33 | 42 | 85 | 63 | 57.2 | 41 | 52 | M16 |
| C6SRKIN25X90 | 63 | 25 | 44 | 53 | 90 | 68 | 57.2 | 47 | 58 | M16 |
| C6SRKIN32X95 | 63 | 32 | 44 | 53 | 95 | 73 | 57.2 | 47 | 58 | M16 |

## C-SCA

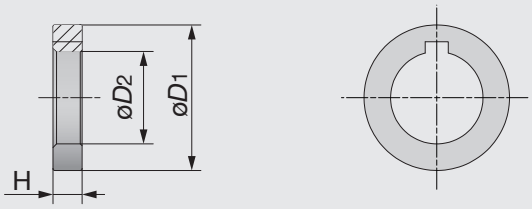
Slot milling holders




| Designation | SS | ød | L | øD1 | L1 | L2 |
|---|---|---|---|---|---|---|
| C6SCA25.4-075 | 63 | 25.4 | 75 | 40 | 55 | 21 |
| C6SCA31.75-075 | 63 | 31.75 | 75 | 46 | 60 | 26 |
| C8SCA25.4-090 | 80 | 25.4 | 90 | 40 | 55 | 21 |
| C8SCA31.75-090 | 80 | 31.75 | 90 | 46 | 60 | 26 |

## SCA

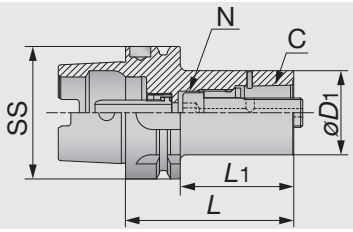
Coller for slot milling holder




| Designation | øD1 | øD2 | H |
|---|---|---|---|
| SCA25.4-02 | 40 | 25.4 | 3,5,7,8,10,12,14 |
| SCA31.75-02 | 46 | 31.75 | 3,5,7,8,10,12,14 |

## HSK-A-C/-T

Basic holders HSK shank

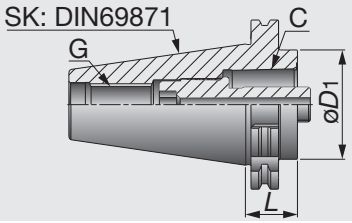



| Designation | SS | C | øD1 | L | L1 | N* |
|---|---|---|---|---|---|---|
| HSK63A-C4-080T | 63 | C4 | 40 | 80 | 54 | 55 |
| HSK63A-C5-090T | 63 | C5 | 50 | 90 | 64 | 95 |
| HSK63A-C6-110T | 63 | C6 | 63 | 110 | 74 | 170 |
| HSK100A-C6-110 | 100 | C6 | 63 | 110 | 81 | 170 |
| HSK100A-C8-120 | 100 | C8 | 80 | 120 | 91 | 170 |

*Recommended torque (N·m) for clamping

## C-ADSKA

Basic holders for DIN 69871 form AD / ADB tapered shanks

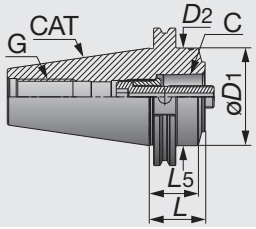



| Designation | C | SK | øD1 | L | G | N* |
|---|---|---|---|---|---|---|
| C4ADSKA40X30 | C4 | 40 | 40 | 30 | M16 | 55 |
| C5ADSKA40X30 | C5 | 40 | 50 | 30 | M16 | 95 |
| C5ADSKA50X30ADB | C5 | 50 | 50 | 30 | M24 | 95 |
| C6ADSKA50X30 | C6 | 50 | 63 | 30 | M24 | 170 |
| C8ADSKA50X70ADB | C8 | 50 | 80 | 70 | M24 | 170 |

*Recommended torque (N·m) for clamping

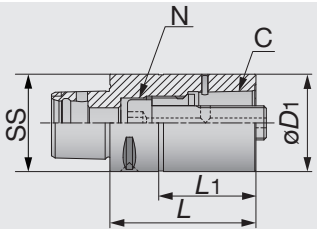
## C-ADCAT

Basic holders for caterpillar AD / ADB tapered shanks




| Designation | C | CAT | øD1 | D2 | L | L5 | G | N* |
|---|---|---|---|---|---|---|---|---|
| C4ADCATI40X40ADB | C4 | 40 | 40 | 44.5 | 40 | 35 | 5/8X11 | 55 |
| C5ADCATI40X90ADB | C5 | 40 | 50 | 45.2 | 90 | 35 | 5/8X11 | 95 |
| C5ADCATI50X40ADB | C5 | 50 | 50 | 69.9 | 40 | 35 | 1-8 | 95 |
| C6ADCATI50X50 | C6 | 50 | 63 | 69.85 | 50 | 37 | 1-8 | 170 |
| C8ADCATI50X100ADB | C8 | 50 | 80 | 70.1 | 100 | 35 | 1-8 | 170 |

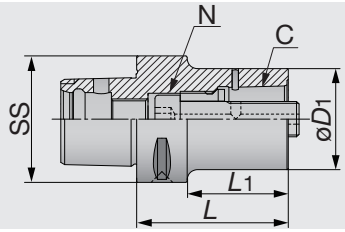
*Recommended torque (N·m) for clamping




| Designation | C | SS | øD1 | L | L1 | N* |
|---|---|---|---|---|---|---|
| C4EX-060 | C4 | 40 | 40 | 60 | 80 | 65 |
| C4EX-080 | C4 | 40 | 40 | 80 | 60 | 65 |
| C5EX-080 | C5 | 50 | 50 | 80 | 60 | 95 |
| C5EX-100 | C5 | 50 | 50 | 100 | 80 | 95 |
| C6EX-100 | C6 | 63 | 63 | 100 | 78 | 170 |
| C6EX-140 | C6 | 63 | 63 | 140 | 118 | 170 |
| C8EX-100 | C8 | 80 | 80 | 100 | 70 | 170 |
| C8EX-160 | C8 | 80 | 80 | 160 | 130 | 170 |

*Recommended torque (N·m) for clamping

## Reduction adapters

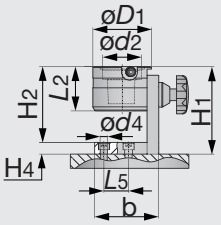



| Designation | C | SS | øD1 | L | L1 | N* |
|---|---|---|---|---|---|---|
| C5-C4RE-060 | C4 | 50 | 40 | 60 | 40 | 55 |
| C5-C4RE-080 | C4 | 50 | 40 | 80 | 60 | 55 |
| C6-C4RE-080 | C4 | 63 | 40 | 80 | 58 | 55 |
| C6-C5RE-080 | C5 | 63 | 50 | 80 | 58 | 95 |
| C6-C5RE-120 | C5 | 63 | 50 | 120 | 98 | 95 |
| C8-C4RE-070 | C4 | 80 | 40 | 70 | 40 | 55 |
| C8-C5RE-080 | C5 | 80 | 50 | 80 | 50 | 95 |
| C8-C6RE-080 | C6 | 80 | 63 | 80 | 50 | 170 |
| C8-C6RE-120 | C6 | 80 | 63 | 120 | 90 | 170 |

*Recommended torque (N·m) for clamping

## MULTI CLAMP (TungCap)

Multi-clamp fixture for TungCap




| Designation | CSI | ød2 | øD1 | L2 | H1 | H2 | H4 | b | L5 | ød4 |
|---|---|---|---|---|---|---|---|---|---|---|
| MULTICLAMPC4 | 40 | 40.4 | 78 | 67 | 137.5 | 118.5 | 19 | 104 | 40 | 12.5 |
| MULTICLAMPC5 | 50 | 50 | 85 | 72 | 142 | 123 | 19 | 104 | 40 | 12.5 |
| MULTICLAMPC6 | 60 | 63 | 95 | 72 | 142 | 123 | 19 | 104 | 40 | 12.5 |
| MULTICLAMPC8 | 80 | 80 | 130 | 90 | 178 | 159 | 19 | 144 | 85 | 12.5 |

MEMO

# **Designation** for clamping units

Fixed-type clamping unit

| | For external (Tool setting direction cross X) | For internal (Tool setting direction straight Z) |
|---|---|---|
| **Turning Unit** | C□-DTO-□C-****-R/L | C□-DTI-□C-****-R/L |
| |  |  |
| **Driving Unit** | C□-DDC-□C-**** | C□-DDS-□C-**** |
| |  |  |

## Description of clamping unit for turning

**C3 - D T I - IC - ***** - R**

| ❶ PSC size | ❷ Device | ❸ Turning |
|---|---|---|
| C* | D | T |

| ❹ Application | |
|---|---|
| O | External |
| I | Internal |

| ❺ Coolant | |
|---|---|
| IC | Internal |
| OC | External |
| WC | Double |

| ❻ Unit number |
|---|
| ***** |

| ❼ Hand | |
|---|---|
| R | Right |
| L | Left |

## Description of clamping unit for driving

**C6 - D D C - OC - *****

| ❶ PSC size | ❷ Device | ❸ Drive |
|---|---|---|
| C* | D | D |

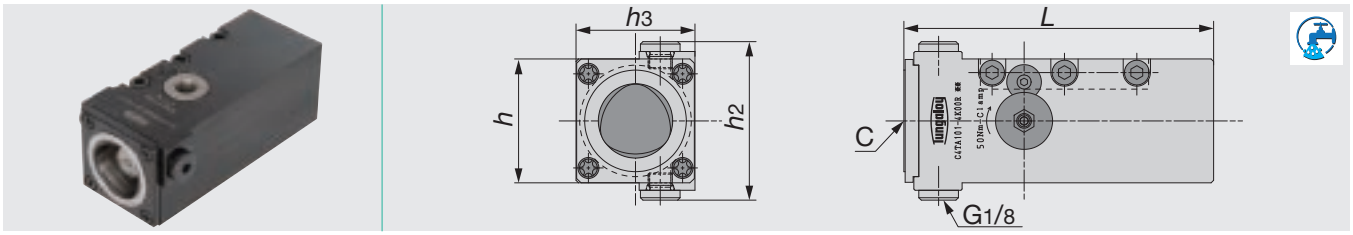
| ❹ Tool setting direction | |
|---|---|
| S | Straight: Z |
| C | Cross: X |
| X | Other |

| ❺ Coolant | |
|---|---|
| IC | Internal |
| OC | External |
| WC | Double |

| ❻ Unit number |
|---|
| ***** |

## C-DTOSR/L

Manual clamping unit; Square shank



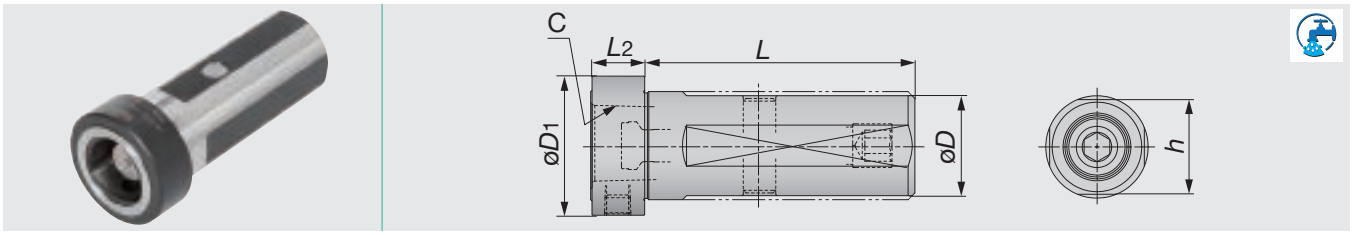

| Designation | C | Turret size h | h3 | h2 | L | N*(N·m) |
|---|---|---|---|---|---|---|
| C3-DTOS4038R/L | C3 | 40 | 38 | 62 | 95 | 35 |
| C4-DTOS5048R/L | C4 | 50 | 48 | 64 | 125 | 50 |
| C5-DTOS6464R/L | C5 | 60 | 64 | 68 | 145 | 70 |

Items for special order.

* Recommend clamping torque.

## C-DTIR

Manual clamping unit; Round shank



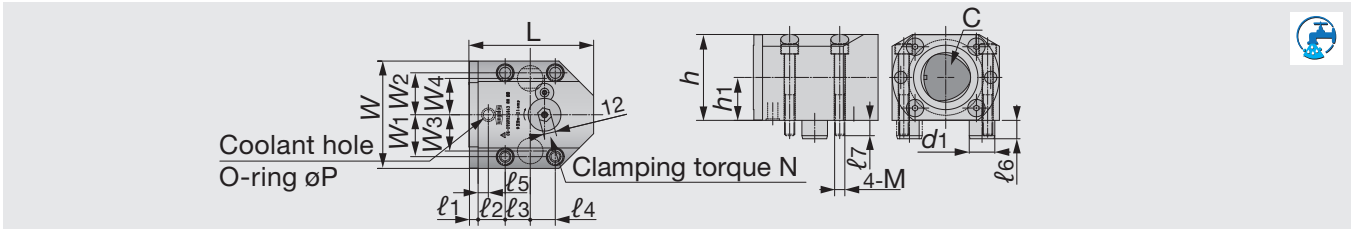

| Designation | C | øD | øD1 | h | L | L2 | N*(N·m) |
|---|---|---|---|---|---|---|---|
| C3-DTIR-08018-D32 | C3 | 32 | 46 | 30 | 80 | 18 | 35 |
| C4-DTIR-10020-D40 | C4 | 40 | 52 | 38 | 100 | 20 | 50 |
| C4-DTIR-12020-D50 | C4 | 50 | 52 | 48 | 120 | 20 | 50 |
| C5-DTIR-12024-D50 | C5 | 50 | 62 | 48 | 120 | 24 | 70 |

Items for special order.

* Recommend clamping torque.

## C-DTOFR/L

Manual clamping unit; Fixed type




| Designation | C | h | h1 | L | W | W1 W2 | W3 W4 | ℓ1 | ℓ2 | ℓ3 ℓ4 | ℓ5 | ℓ6 | ℓ7 | d1(f6*) | P | M | N*(N·m) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C5-DTOFR/L32048 | C5 | 64 | 32 | 100 | 92 | 35 | 31 | 8 | 19 | 21 | 7 | 11 | 15 | 20 | P8 | M10 | 70 |
| C6-DTOFR/L42060 | C6 | 84 | 42 | 122 | 105 | 41 | 35.5 | 9 | 26.5 | 24.5 | 10 | 18 | 15 | 25 | P10 | M10 | 90 |
| C8-DTOFR/L50088 | C8 | 100 | 50 | 146 | 133 | 55 | 46 | 12 | 33 | 43 | 13 | 19 | 20 | 32 | P11 | M12 | 130 |

Items for special order.

* f6 tolerance: d20 & 25 = -0.022 / -0.033, d32 = 0.025 / -0.041.

* Recommend clamping torque.

Selection for External turning

Fig. 1

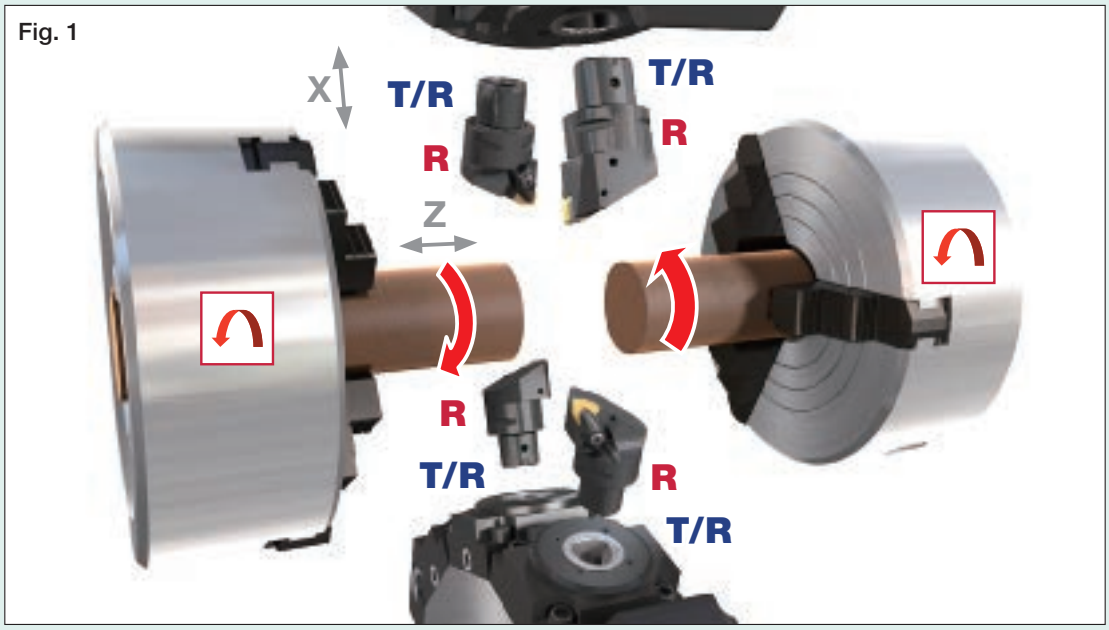
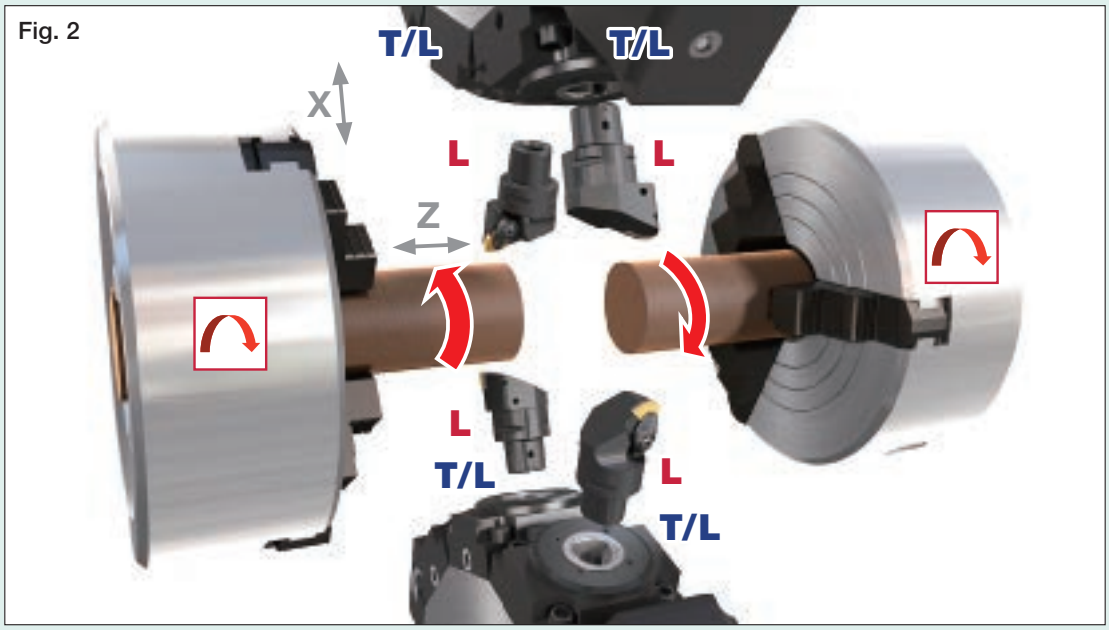



Fig. 2






**R:** Rigth hand cutting tool, **L:** Left hand cutting tool
**T/R:** Right hand clamping unit, **T/L:** Left hand clamping unit

■ Spindle rotation

: Clockwise : Counterclockwise

| Spindle | Rotation | Hand | | Fig. |
|---|---|---|---|---|
| | | Clamping Unit | Cutting Head | |
| Left side | Counterclockwise | L | L | 1 |
| Right side | Counterclockwise | L | L | 1 |
| Left side | Clockwise | R | R | 2 |
| Right side | Clockwise | R | R | 2 |

# **Clamping** units & tools for CNC lathes

Selection for Internal turning

Fig. 1

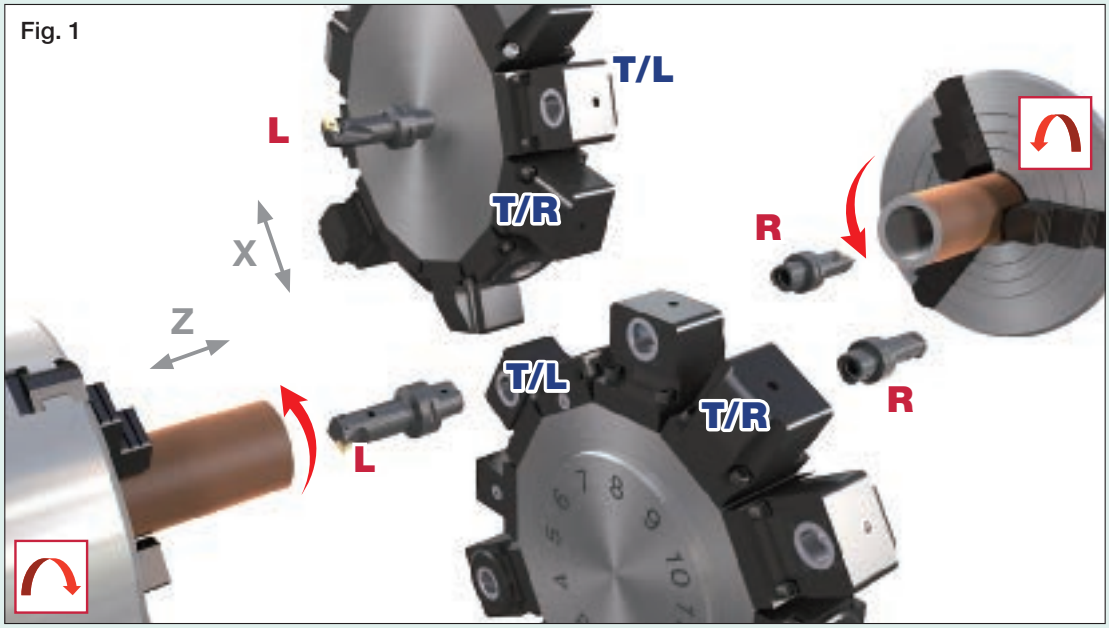
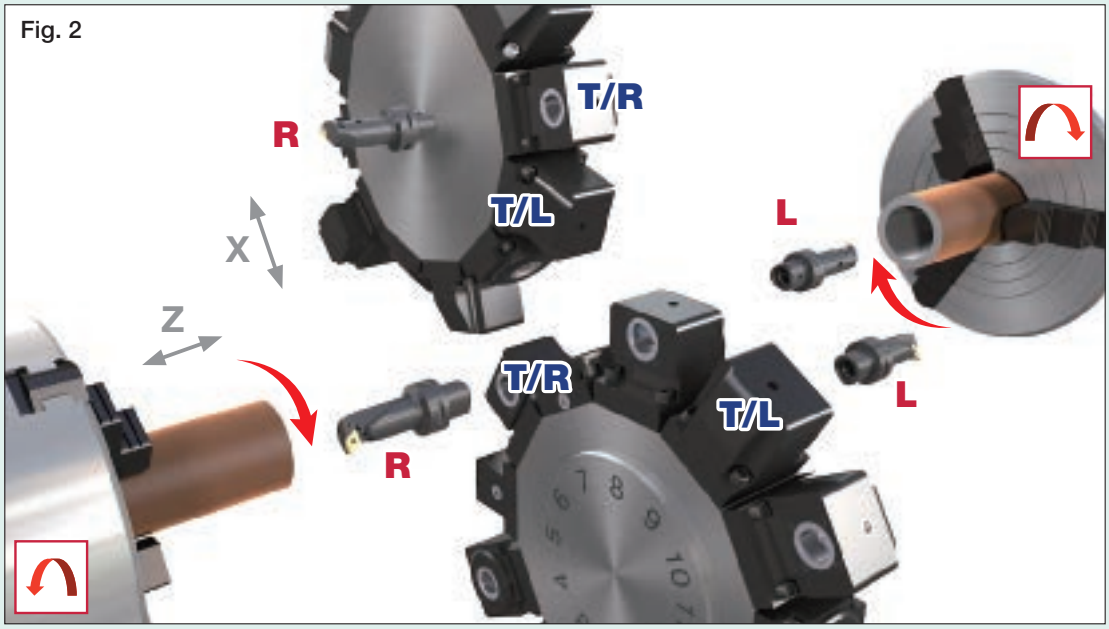



Fig. 2




**R:** Rigth hand cutting tool, **L:** Left hand cutting tool
**T/R:** Right hand clamping unit, **T/L:** Left hand clamping unit

■ Spindle rotation

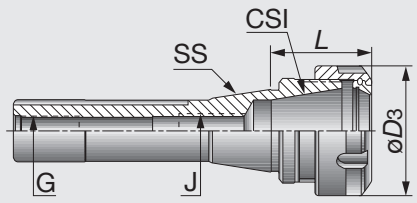
: Clockwise : Counterclockwise

| Spindle | Rotation | Hand | | Fig. |
|---|---|---|---|---|
| | | Clamping unit | Cutting head | |
| Left side | Clockwise | L | L | 1 |
| Right side | Counterclockwise | R | R | 1 |
| Left side | Counterclockwise | R | R | 2 |
| Right side | Clockwise | L | L | 2 |

TUNGHOLD

## R-8 ER (Collet chuck)

ER collet chucks with R-8 Bridgeport shank



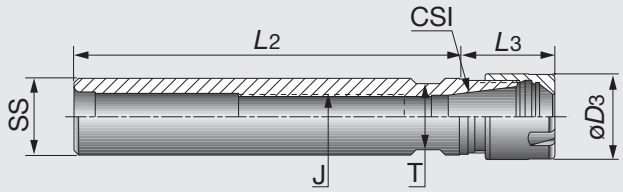

| Designation | SS | CSI | Range | *L* | *øD3* | J | G |
|---|---|---|---|---|---|---|---|
| R-8ER16X38 | R-8 | ER16 | 0.5-10 | 38 | 28 | M10 | 7/16-20 |
| R-8ER32X40 | R-8 | ER32 | 2-20 | 40 | 50 | M12 | 7/16-20 |
| R-8ER40X72 | R-8 | ER40 | 3-26 | 72 | 63 | M12 | 7/16-20 |

(Option:Wrench for ER collet)

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## ST-ER-M (Mini collet)

ER Mini-collet chucks with Straight shank



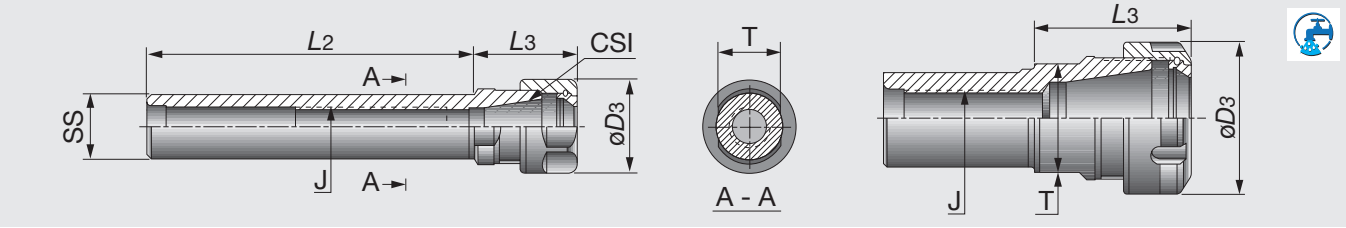

| Designation | SS | CSI | Range | *L2* | *L3* | J | *øD3* | T |
|---|---|---|---|---|---|---|---|---|
| ST12X80ER11M | 12 | ER11 | 0.5-7 | 80 | 26.5 | - | 16 | 11 |
| ST16X50ER11MF | 16 | ER11 | 0.5-7 | 50 | 18.5 | M8 | 16 | 13 |
| ST16X100ER11M | 16 | ER11 | 0.5-7 | 100 | 18.5 | M8 | 16 | 13 |
| ST16X150ER11M | 16 | ER11 | 0.5-7 | 150 | 18.5 | M8 | 16 | 13 |
| ST12X80ER16M | 12 | ER16 | 0.5-10 | 80 | 36.5 | - | 22 | 17 |
| ST20X100ER16M | 20 | ER16 | 0.5-10 | 100 | 25 | M12 | 22 | 17 |
| ST20X150ER16M | 20 | ER16 | 0.5-10 | 150 | 25 | M12 | 22 | 17 |
| ST20X100ER20M | 20 | ER20 | 1-13 | 100 | 40 | M12 | 28 | 21 |
| ST20X150ER20M | 20 | ER20 | 1-13 | 150 | 40 | M12 | 28 | 21 |

• F indicates a flat on the shank.

(Option:Wrench for ER collet)

## ST-ER (Collet chuck)

ER collet chucks with Straight shank




| Designation | SS | CSI | Range | *L2* | *L3* | J | *øD3* | T |
|---|---|---|---|---|---|---|---|---|
| ST16X50ER11F | 16 | ER11 | 0.5-7 | 50 | 18.5 | M8 | 19 | 13 |
| ST20X50ER11F | 20 | ER11 | 0.5-7 | 50 | 18.5 | M10 | 19 | 17 |
| ST20X100ER11 | 20 | ER11 | 0.5-7 | 100 | 18.5 | M10 | 19 | 17 |
| ST20X150ER11 | 20 | ER11 | 0.5-7 | 150 | 18.5 | M10 | 19 | 17 |
| ST20X50ER16F | 20 | ER16 | 0.5-10 | 50 | 32.3 | M12 | 28 | 19 |
| ST20X100ER16 | 20 | ER16 | 0.5-10 | 100 | 30 | M12 | 28 | 19 |
| ST20X150ER16 | 20 | ER16 | 0.5-10 | 150 | 30 | M12 | 28 | 19 |
| ST20X50ER20F | 20 | ER20 | 1-13 | 50 | 42.5 | M12 | 34 | 22 |
| ST25X100ER20 | 25 | ER20 | 1-13 | 100 | 36 | M16 | 34 | 22 |
| ST25X150ER20 | 25 | ER20 | 1-13 | 150 | 36 | M16 | 34 | 22 |
| ST20X50ER25F | 20 | ER25 | 1-16 | 50 | 46 | M12 | 42 | 28 |
| ST20X100ER25 | 20 | ER25 | 1-16 | 100 | 46 | M12 | 42 | 28 |
| ST20X50ER32F | 20 | ER32 | 2-20 | 50 | 54 | M12 | 50 | 36 |
| ST20X100ER32 | 20 | ER32 | 2-20 | 100 | 54 | M12 | 50 | 36 |
| ST25X50ER25F | 25 | ER25 | 1-16 | 50 | 46 | M16 | 42 | 28 |
| ST25X100ER25 | 25 | ER25 | 1-16 | 100 | 46 | M16 | 42 | 28 |
| ST25X50ER32F | 25 | ER32 | 2-20 | 50 | 52 | M16x2 | 50 | 36 |
| ST25X50ER40F | 25 | ER40 | 3-26 | 50 | 60 | M16x2 | 63 | 45 |
| ST30X50ER32F | 30 | ER32 | 2-20 | 50 | 52 | M18x1.5 | 50 | 36 |
| ST30X50ER40F | 30 | ER40 | 3-26 | 50 | 60 | M18x1.5 | 63 | 45 |
| ST32X50ER32F | 32 | ER32 | 2-20 | 50 | 52 | M18x1.5 | 50 | 36 |
| ST32X150ER32 | 32 | ER32 | 2-20 | 150 | 52 | M18x1.5 | 50 | 36 |
| ST32X50ER40F | 32 | ER40 | 3-26 | 50 | 60 | M18x1.5 | 63 | 45 |
| ST40X75ER32F | 40 | ER32 | 2-20 | 75 | 46 | M22x1.5 | 50 | 44 |
| ST40X75ER40F | 40 | ER40 | 3-26 | 75 | 55 | M22x1.5 | 63 | 45 |
| ST50X80ER40F | 50 | ER40 | 3-26 | 80 | 60 | M28x1.5 | 63 | 54 |
| ST50X80ER50F | 50 | ER50 | 10-34 | 80 | 77 | M36x1.5 | 78 | 58 |

• F indicates a flat on the shank.

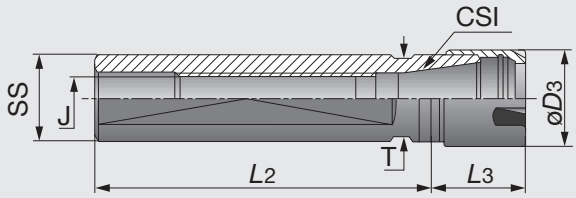
(Option:Wrench for ER collet)

Tooling System

# TUNGHOLD

## ST-ER-MF

ER Mini-collet chucks with flat cotter for SWISS type machines



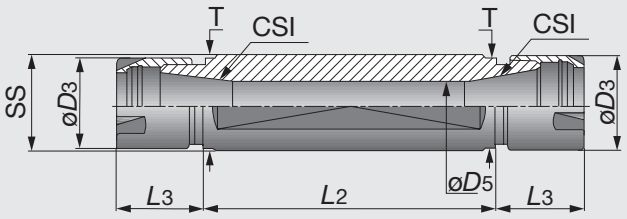

| Designation | SS | CSI | Range | *L2* | *L3* | J | *øD3* | T | Machine |
|---|---|---|---|---|---|---|---|---|---|
| ST16X35ER16MF | 16 | ER16 | 0.5-10 | 35 | 36 | M8X1 | 22 | 17 | Star |
| ST16X38ER11MF | 16 | ER11 | 0.5-7 | 38 | 18.5 | M8X1 | 16 | 14 | Star |
| ST16X140ER11MF | 16 | ER11 | 0.5-7 | 140 | 18.5 | M8X1 | 16 | 14 | - |
| ST20X70ER16MF | 20 | ER16 | 0.5-10 | 70 | 26 | M12X1 | 22 | 17 | Citizen |
| ST20X120ER16MF | 20 | ER16 | 0.5-10 | 120 | 26 | M12X1 | 22 | 17 | Citizen |
| ST20X140ER16MF | 20 | ER16 | 0.5-10 | 140 | 26 | M12X1 | 22 | 17 | Citizen |
| ST22X38ER16MF | 22 | ER16 | 0.5-10 | 38 | 26 | M12X1 | 22 | 19 | Citizen |
| ST22X70ER16MF | 22 | ER16 | 0.5-10 | 70 | 26 | M12X1 | 22 | 19 | Star |
| ST22X70ER25MF | 22 | ER25 | 1-16 | 70 | 47 | M12X1 | 35 | 27 | Star |
| ST22X80ER20MF | 22 | ER20 | 1-13 | 80 | 39 | M12X1 | 28 | 21 | Star |
| ST22X100ER16MF | 22 | ER16 | 0.5-10 | 100 | 28 | M12X1 | 22 | 19 | Star |
| ST25X65ER16MF | 25 | ER16 | 0.5-10 | 65 | 28 | M12X1 | 22 | 22 | - |
| ST25X75ER25MF | 25 | ER25 | 1-16 | 75 | 48 | M14X1 | 35 | 27 | Manurhin |
| ST25X100ER20MF | 25 | ER20 | 1-13 | 100 | 28 | M14X1 | 28 | 22 | Tornos |
| ST25X145ER25MF | 25 | ER25 | 1-16 | 145 | 36 | M14X1 | 35 | 27 | Tornos |
| ST25X154ER20MF | 25 | ER20 | 1-13 | 154 | 28 | M14X1 | 28 | 22 | Tornos |
| ST32X70ER25MF | 32 | ER25 | 1-16 | 70 | 30 | M18X1 | 35 | 27 | Schuette |

(Option = Wrench for ER collet)

# TUNGHOLD

## ST-ER-MF-D

Double ended Mini-collet chucks with flat cotter



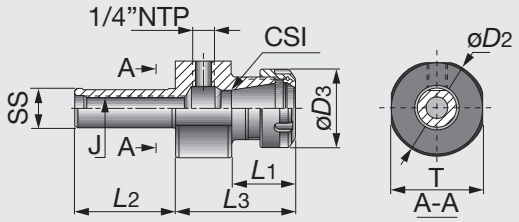

| Designation | SS | CSI | Range | *L2* | *L3* | *øD3* | *ød5* | T | Machine |
|---|---|---|---|---|---|---|---|---|---|
| ST16X50ER11MFD | 16 | ER11 | 0.5-7 | 50 | 18.5 | 16 | 7.5 | 14 | - |
| ST20X30ER11MFD | 20 | ER11 | 0.5-7 | 30 | 18.5 | 16 | 7.5 | 17 | Citizen |
| ST20X50ER11MFD | 20 | ER11 | 0.5-7 | 50 | 18.5 | 16 | 7.5 | 17 | Citizen |
| ST20X55ER16MFD | 20 | ER16 | 0.5-10 | 55 | 25 | 22 | 10.5 | 17 | Citizen |
| ST22X55ER16MFD | 22 | ER16 | 0.5-10 | 55 | 28 | 22 | 10.5 | 19 | Star |
| ST22X75ER16MFD | 22 | ER16 | 0.5-10 | 75 | 28 | 22 | 10.5 | 19 | Star |
| ST25X62ER16MFD | 25 | ER16 | 0.5-10 | 62 | 28 | 22 | 10.5 | 22 | - |
| ST32X55ER20MFD | 32 | ER20 | 1-13 | 55 | 28 | 28 | 13.5 | 27 | Star |
| ST32X75ER20MFD | 32 | ER20 | 1-13 | 75 | 28 | 28 | 13.5 | 27 | Star |

(Option = Wrench for ER collet)

# TUNGHOLD

## ST-ER-S

ER collet chucks with internal coolant



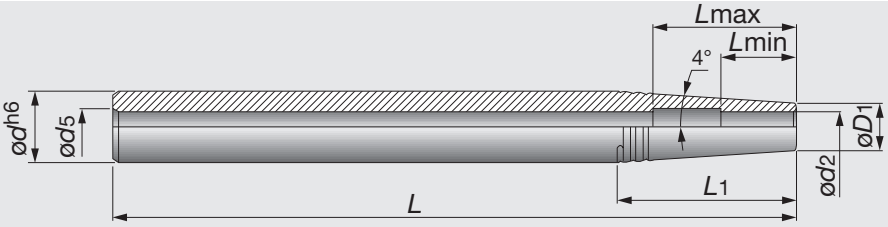

| Designation | SS | CSI | Range | $L_2$ | $L_3$ | $L_1$ | J | $øD_3$ | $øD_2$ | T |
|---|---|---|---|---|---|---|---|---|---|---|
| ST20X65ER16S | 20 | ER16 | 0.5-10 | 65 | 54 | 29.6 | M12 | 28 | 40 | 34 |
| ST20X65ER20S | 20 | ER20 | 1-13 | 65 | 63 | 31 | M12 | 34 | 40 | 34 |
| ST20X65ER25S | 20 | ER25 | 1-16 | 65 | 72 | 32 | M12 | 42 | 54 | 51 |
| ST20X65ER32S | 20 | ER32 | 2-20 | 65 | 77 | 41 | M12 | 50 | 63 | 59 |
| ST25X65ER25S | 25 | ER25 | 1-16 | 65 | 72 | 32 | M12 | 42 | 54 | 50 |
| ST25X65ER32S | 25 | ER32 | 2-20 | 65 | 77 | 41 | M16 | 50 | 63 | 59 |
| ST32X65ER32S | 32 | ER32 | 2-20 | 65 | 77 | 41 | M18x1.5 | 50 | 63 | 59 |
| ST40X75ER32S | 40 | ER32 | 2-20 | 75 | 77 | 41 | M22x1.5 | 50 | 63 | 59 |

(Option = Wrench for ER collet)

# TUNGSHRINK

## ST-SRK

TungShrink thermal shrinking holder for carbide shank with Straight shank



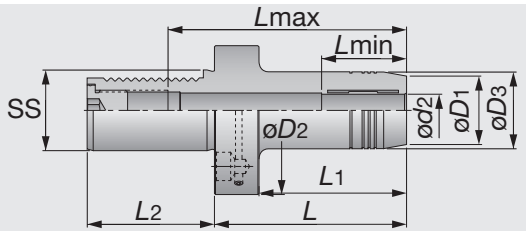

| Designation | ød | ød2 | øD1 | ød5 | L | L1 | Lmin | Lmax |
|---|---|---|---|---|---|---|---|---|
| ST12X160SRK3 | 12 | 3 | 10 | 4 | 160 | 14.3 | 10 | - |
| ST12X160SRK4 | 12 | 4 | 10 | 4 | 160 | 14.3 | 12 | 27 |
| ST16X160SRK3 | 16 | 3 | 10 | 6 | 160 | 43 | 10 | - |
| ST16X160SRK4 | 16 | 4 | 10 | 6 | 160 | 43 | 12 | - |
| ST16X160SRK5 | 16 | 5 | 10 | 6 | 160 | 43 | 15 | - |
| ST16X160SRK6 | 16 | 6 | 11 | 6 | 160 | 35.5 | 18 | 35 |
| ST20X200SRK5 | 20 | 5 | 10 | 6 | 200 | 71.5 | 15 | - |
| ST20X200SRK6 | 20 | 6 | 11 | 6 | 200 | 64.5 | 18 | 40 |
| ST20X200SRK8 | 20 | 8 | 14 | 6 | 200 | 43 | 25 | 40 |
| ST25X200SRK6 | 25 | 6 | 11 | 8 | 200 | 100 | 18 | 35 |
| ST25X200SRK8 | 25 | 8 | 14 | 8 | 200 | 78.6 | 25 | 40 |
| ST25X200SRK10 | 25 | 10 | 16 | 8 | 200 | 64.3 | 30 | 50 |
| ST25X200SRK12 | 25 | 12 | 20 | 8 | 200 | 35.7 | 32 | 52 |

(Option = Wrench for ER collet)

# TUNGHYDRO

## DIN69880-HYDRO

Hydraulic chuck hodlers with DIN698880 shank




(Unit: mm)

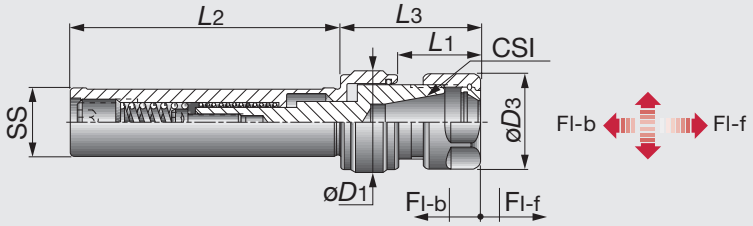
| Designation | ød | øD1 | øD3 | øD2 | ød2 | L2 | L | L1 | Lmin | Lmax |
|---|---|---|---|---|---|---|---|---|---|---|
| DIN69880 30 HYDRO 20X89 | 20 | 38 | 42 | 68 | 30 | 55 | 89 | 73 | 48 | 85 |
| DIN69880 30 HYDRO 25X100 | 25 | 46 | 50 | 68 | 30 | 55 | 100 | 78 | 54 | 85 |
| DIN69880 30 HYDRO 32X100 | 32 | 56 | 60 | 68 | 30 | 55 | 100 | 78 | 58 | 90 |
| DIN69880 40 HYDRO 20X95 | 20 | 38 | 42 | 83 | 40 | 63 | 95 | 73 | 48 | 130 |
| DIN69880 40 HYDRO 25X95 | 25 | 46 | 50 | 83 | 40 | 63 | 95 | 73 | 54 | 130 |
| DIN69880 40 HYDRO 32X95 | 32 | 56 | 60 | 83 | 40 | 63 | 95 | 78 | 58 | 90 |

Clamping wrench (wrench HYDRO HEX 4) should be ordered separately.
**Note**: Available are reduction sleeves for 12, 20, 25 and 32 mm bore diameters. Chucking forces will significantly reduce if reduction sleeves are used (ordered separately).

# TUNGGTI

## GTI-ER-ST

TungGTI tapping attachment with straight shank



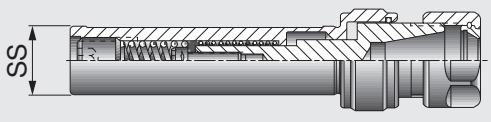

| Designation | SS | CSI | Tap min | Tap max | Range | øD3 | øD1 | L1 | L3 | L2 | Fl-f | Fl-b |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GTIER11ST16X150M | 16 | ER11 | M2 | M7 | 0.5-7 | 16 | - | 19 | - | 150 | 6 | 3 |
| GTIER16ST20X80 | 20 | ER16 | M3 | M10 | 0.5-10 | 28 | 29.5 | 24.6 | 41.6 | 80 | 8 | 3 |
| GTIER20ST20X80 | 20 | ER20 | M4 | M14 | 1-13 | 34 | 33.5 | 28 | 49 | 80 | 8 | 3 |
| GTIER25ST25X80 | 25 | ER25 | M5 | M16 | 1-16 | 42 | 40.5 | 32 | 53 | 80 | 9 | 4 |
| GTIER32ST25X80 | 25 | ER32 | M6 | M20 | 1-16 | 50 | 56.5 | 32 | 77.2 | 80 | 9 | 4 |
| GTIER40ST32X80 | 32 | ER40 | M6 | M27 | 2-20 | 63 | 56.5 | 51 | 95.2 | 80 | 9 | 4 |

• Wrench is not included.

(Option = Wrench for ER collet)

## KIT GTI-ER-ST

The Kit contains a DIN 6499 ER tapping attachment with straight shank and a set of spring collets in various bore sizes



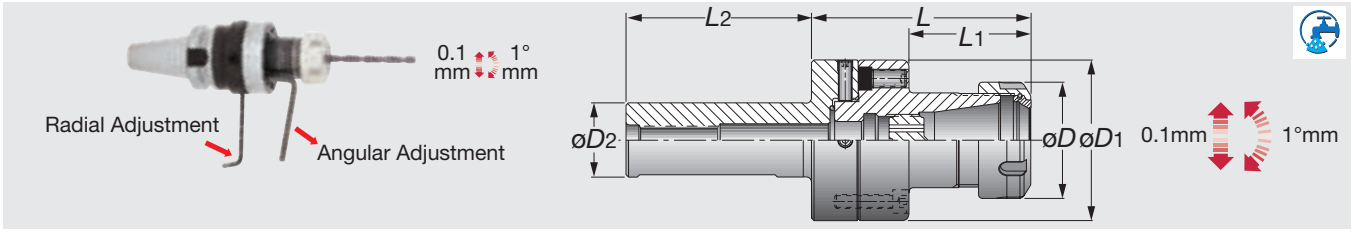



| Designation | SS | Qty | Range |
|---|---|---|---|
| KITGTIER11ST16X1504M | ER11 | 4 | 3,4,5,6 |
| KITGTIER16ST20X804 | ER16 | 4 | 4,5,6,7 |
| KITGTIER20ST20X804 | ER20 | 4 | 5,6,7,8 |
| KITGTIER25ST25X805 | ER25 | 5 | 6,7,9,11,12 |
| KITGTIER32ST25X806 | ER32 | 6 | 6,7,9,11,12,16 |
| KITGTIER40ST32X806 | ER40 | 6 | 9,11,14,16,18,20 |

• Includes GTI, collets & wrench

# TUNGHOLD
## ADJ ST-ER

ER collet chuck with center alignment

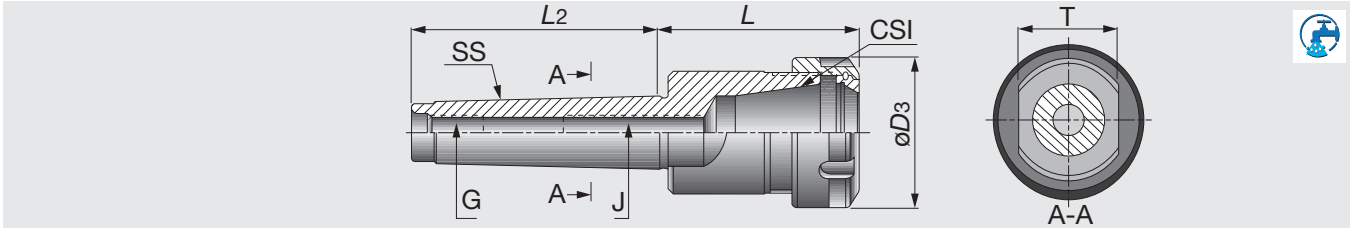



| Designation | Range | L | L1 | L2 | øD | øD1 | øD2 |
|---|---|---|---|---|---|---|---|
| ADJST25D70ER32 | 2-20 | 94.5 | 52.5 | 80 | 50 | 70 | 25 |
| ADJST32D70ER32 | 2-20 | 94.5 | 52.5 | 80 | 50 | 70 | 32 |

(Option = Wrench for ER collet)

# TUNGHOLD
## MT-ER

ER collet chucks with morse taper

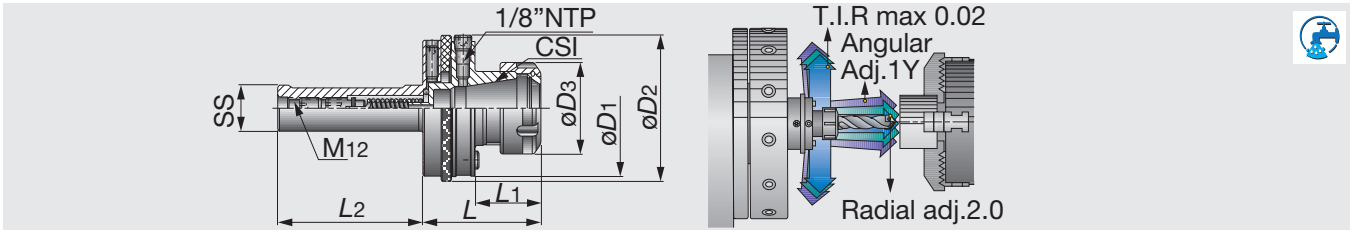



| Designation | SS | CSI | Range | L | L2 | øD3 | J | G | T |
|---|---|---|---|---|---|---|---|---|---|
| MT2ER20X48.5 | MT 2 | ER20 | 1-13 | 48.5 | 64 | 34 | M10 | M10 | 22 |
| MT2ER25X52 | MT 2 | ER25 | 1-16 | 52 | 64 | 42 | M10 | M10 | 28 |
| MT3ER32X69 | MT 3 | ER32 | 2-20 | 69 | 81 | 50 | M12 | M12 | 24 |
| MT3ER40X79 | MT 3 | ER40 | 3-26 | 79 | 81 | 63 | M12 | M12 | 24 |
| MT4ER32X61 | MT 4 | ER32 | 2-20 | 60.5 | 102.5 | 50 | M16 | M16 | 32 |
| MT4ER40X82 | MT 4 | ER40 | 3-26 | 81.5 | 102.5 | 63 | M16 | M16 | 32 |
| MT4ER50X108 | MT 4 | ER50 | 10-34 | 107.5 | 102.5 | 78 | M16 | M16 | 32 |
| MT5ER40X82 | MT 5 | ER40 | 3-26 | 82 | 129.5 | 63 | M28x1.5 | M20 | 45 |
| MT5ER50X85 | MT 5 | ER50 | 10-34 | 85 | 129.5 | 78 | M28x1.5 | M20 | 45 |

(Option = Wrench for ER collet)

# TUNGGYRO
## GYRO ST-ER

Center alignment collet chuck holder for lathe



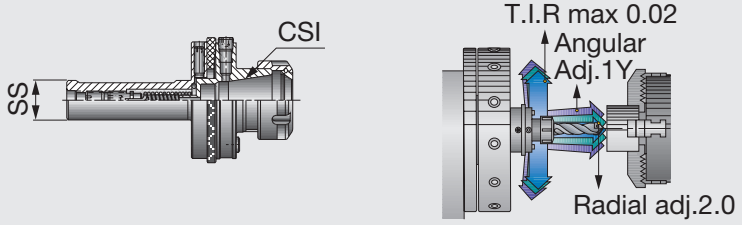

| Designation | SS | CSI | Range | L | L1 | L2 | øD3 | øD1 | øD2 |
|---|---|---|---|---|---|---|---|---|---|
| GYROST20ER20 | 20 | ER20 | 1-13 | 58.8 | 28.5 | 80 | 34 | 57 | 63 |
| GYROST20ER25 | 20 | ER25 | 1-16 | 58.8 | 28.5 | 80 | 34 | 57 | 63 |
| GYROST25ER25 | 25 | ER25 | 1-16 | 65.65 | 35.5 | 80 | 42 | 74 | 79 |
| GYROST25ER32 | 25 | ER32 | 2-20 | 66.65 | 36.5 | 80 | 50 | 74 | 79 |
| GYROST32ER32 | 32 | ER32 | 2-20 | 66.65 | 36.5 | 80 | 50 | 74 | 79 |
| GYROST40ER32 | 40 | ER32 | 2-20 | 66.65 | 36.5 | 80 | 50 | 74 | 79 |

• First-time users should buy a GYRO kit which includes a test bar and a bushing for performing the alignment procedure.

(Option = Wrench for ER collet)

## KIT GYRO-ST-ER

The Kit contains 1 center alignment collet chuck and a centering bushing




| Designation | SS | CSI | Range |
|---|---|---|---|
| KITGYROST20ER20 | 20 | ER20 | 1-13 |
| KITGYROST20ER25 | 20 | ER25 | 1-16 |
| KITGYROST25ER25 | 25 | ER25 | 1-16 |
| KITGYROST25ER32 | 25 | ER32 | 2-20 |
| KITGYROST32ER32 | 32 | ER32 | 2-20 |
| KITGYROST40ER32 | 40 | ER32 | 2-20 |

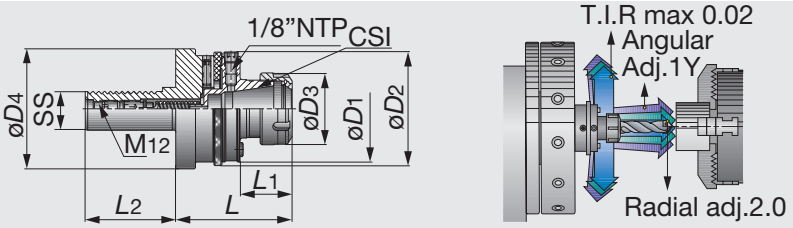
• Kit includes: GYRO, test bar and bushing.

(Option = Wrench for ER collet)

TUNGGYRO

## GYRO DIN69880-ER

Center alignment collet chuck holder for lathe



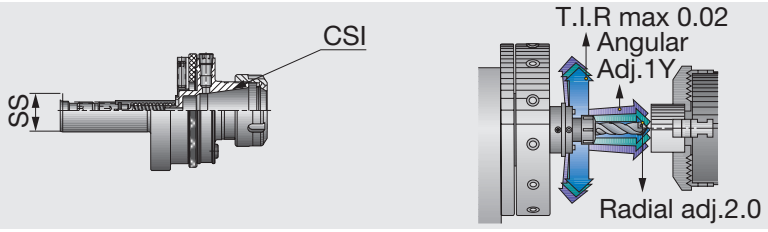

| Designation | SS | CSI | Range | *L* | *L*1 | *L*2 | ø*D*3 | ø*D*1 | ø*D*2 | ø*D*4 |
|---|---|---|---|---|---|---|---|---|---|---|
| GYRODIN6988030ER25 | 30 | ER25 | 1-16 | 80.65 | 35.5 | 55 | 42 | 74 | 79 | 68 |
| GYRODIN6988030ER32 | 30 | ER32 | 2-20 | 81.65 | 36.5 | 55 | 50 | 74 | 79 | 68 |
| GYRODIN6988040ER32 | 40 | ER32 | 2-20 | 81.65 | 36.5 | 63 | 50 | 74 | 79 | 83.2 |
| GYRODIN6988050ER32 | 50 | ER32 | 2-20 | 81.65 | 36.5 | 78 | 50 | 74 | 79 | 98 |

• First-time users should buy a GYRO kit which includes a test bar and a bushing for performing the alignment procedure.

(Option = Wrench for ER collet)

## KIT GYRO-DIN69880-ER

The Kit contains 1 center alignment ER collet chuck with VDI DIN69880 shank and a centering bushing




| Designation | SS | CSI | Range |
|---|---|---|---|
| KITGYRO30D69880ER25 | 30 | ER25 | 1-16 |
| KITGYRO30D69880ER32 | 30 | ER32 | 2-20 |
| KITGYRO40D69880ER32 | 40 | ER32 | 2-20 |
| KITGYRO50D69880ER32 | 50 | ER32 | 2-20 |

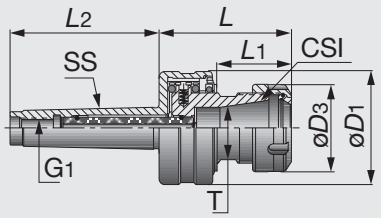
• Kit includes: GYRO, test bar and bushing.

(Option = Wrench for ER collet)

TUNGGFI

## GFI-MT-ER

Floating reamer collet chuck




| Designation | SS | CSI | Range | L2 | L | L1 | øD3 | øD1 | Radial Float | T | G1 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| GFIMT2ER20 | MT 2 | ER20 | 1-13 | 64 | 60.5 | 34.5 | 34 | 50 | 1 | 22 | M10 |
| GFIMT3ER32 | MT 3 | ER32 | 2-20 | 81 | 81.9 | 45.9 | 50 | 65 | 1.6 | 36 | M12 |

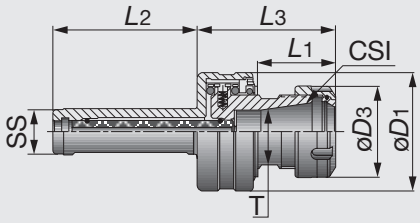
• Maximum 2000 min$^{-1}$.

Option (Wrench for ER collet)

TUNGGFI

## GFI-ST-ER

Floating reamer collet chuck




| Designation | SS | CSI | Range | L2 | L3 | L1 | øD3 | øD1 | Radial Floa | T |
|---|---|---|---|---|---|---|---|---|---|---|
| GFIST20ER20 | 20 | ER20 | 1-13 | 65 | 55.5 | 34.5 | 34 | 50 | 1 | 22 |
| GFIST25ER32 | 25 | ER32 | 2-20 | 80 | 76.9 | 45.9 | 50 | 65 | 1.6 | 36 |

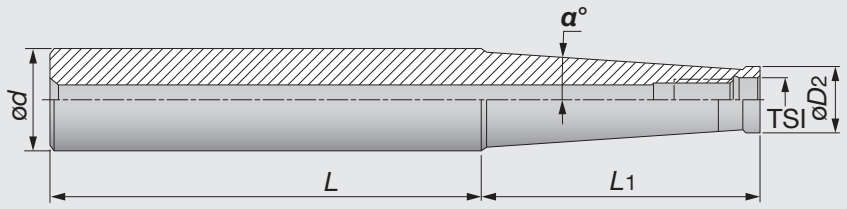
• Maximum 2000 min$^{-1}$.

Option (Wrench for ER collet)

# TUNGFLEX

## S M TungFlex-straight shank

TungFlex modular tooling system with straight shank (Screw clamp holder for modular cutting heads)



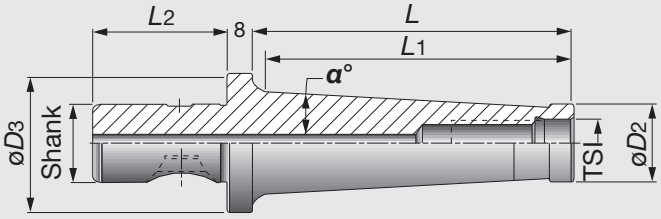

| Designation | ød | øD2 | L | L1 | α° | TSI |
|---|---|---|---|---|---|---|
| SM06-L60C10 | 10 | 9.7 | 60 | 20 | 0 | M6 |
| SM06-L105-C12 | 12 | 9.7 | 105 | 60 | 1.2 | M6 |
| SM06-L125-C16 | 16 | 9.7 | 125 | 60 | 3.3 | M6 |
| SM08-L73C16 | 16 | 13 | 73 | 25 | 0 | M8 |
| SM08-L128-C16 | 16 | 13 | 128 | 80 | 0.9 | M8 |
| SM08-L170-C20 | 20 | 13 | 170 | 66.8 | 3.3 | M8 |
| SM10-L80C20 | 20 | 18 | 80 | 30 | 0 | M10 |
| SM10-L130-C20 | 20 | 18 | 130 | 80 | 0.6 | M10 |
| SM10-L200-C25 | 25 | 19 | 200 | 57.2 | 3.3 | M10 |
| SM12-L86-C25 | 25 | 21 | 86 | 30 | 5.1 | M12 |
| SM12-L200-C32 | 32 | 21 | 200 | 78 | 4.4 | M12 |
| SM16-L95-C32 | 32 | 29 | 95 | 35 | 1.7 | M16 |
| SM16-L230-C32 | 32 | 29 | 230 | 50 | 1.8 | M16 |

• All of the shanks have a coolant holes.

# TUNGFIT TUNGFLEX

## S M-CF4 TungFit adaptor

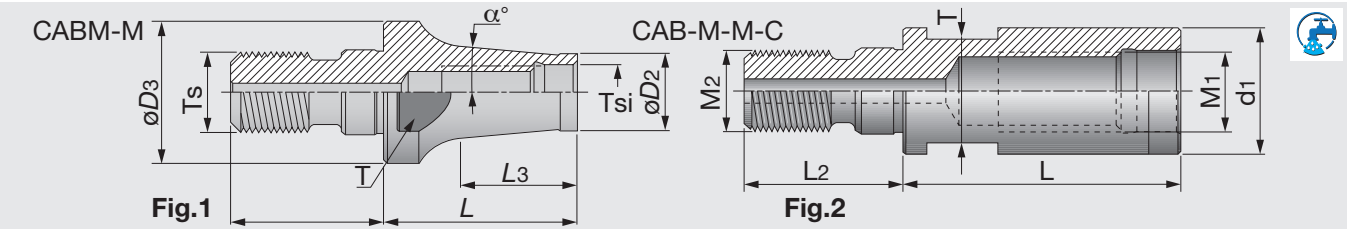
TungFlex cobversion adaptor with TungFit




| Designation | øD2 | L | L1 | α° | shank | øD3 | L2 | TSI |
|---|---|---|---|---|---|---|---|---|
| SM12-L85/3.30-CF4 | 21 | 93 | 81.3 | 4.4 | CF4 | 44 | 42 | M12 |
| SM16-L130/5.11-CF4 | 29 | 138 | 126.8 | 2.6 | CF4 | 44 | 42 | M16 |
| SM12-L140/5.50-CF4 | 21 | 148 | 139.1 | 4.4 | CF4 | 44 | 42 | M12 |
| SM16-L170/6.70-CF4 | 29 | 178 | 168.6 | 2 | CF4 | 44 | 42 | M16 |

# TUNGFLEX
## CAB M-M extension

TungFlex reducer and extensions

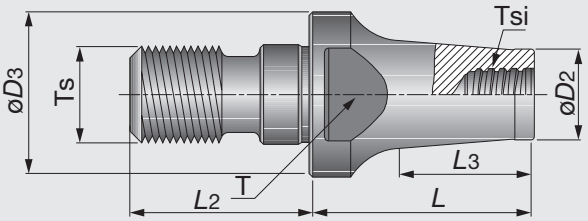



| Designation | Ts | α° | øD2 | L | L3 | øD3 | L2 | T | Tsi |
|---|---|---|---|---|---|---|---|---|---|
| CABM06M08 | M8 | 5.7 | 9.7 | 30 | 24.8 | 13 | 17.5 | 9.5 | M6 |
| CABM08M08-C (1) | M8 | 0 | 13 | 30 | - | - | 17.5 | 9.6 | M8 |
| CABM08M10 | M10 | 5.2 | 13 | 40 | 33.4 | 18 | 20 | 15 | M8 |
| CABM10M10-C (1) | M10 | 0 | 18 | 35 | - | - | 20 | 15 | M10 |
| CABM10M12 | M12 | 2.5 | 18 | 45 | 36.4 | 21 | 22 | 17 | M10 |
| CABM12M12-C (1) | M12 | 0 | 21 | 40 | - | - | 22 | 17 | M12 |
| CABM12M16 | M16 | 6.3 | 21 | 50 | 42.5 | 29 | 25 | 25 | M12 |
| CABM16M16-C (1) | M16 | 0 | 29 | 40 | - | - | 25 | 25 | M16 |

(1) With coolant holes

# TUNGFLEX
## VAD-M

TungFlex cobversion adaptor with TungMeister



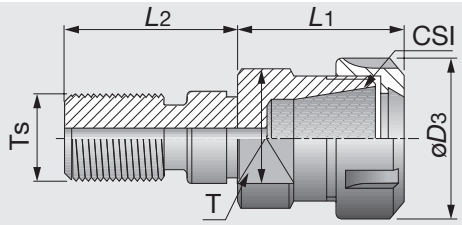

S = Connection screw size

| Designation | øD2 | øD3 | L | L2 | L3 | Tsi | Ts | T |
|---|---|---|---|---|---|---|---|---|
| VAD130L016S08-S-M8 | 11.7 | 13 | 16 | 17.5 | 6 | S08 | M8 | 11 |
| VAD130L025S08-S-M8 | 11.7 | 13 | 25 | 17.5 | 20 | S08 | M8 | 11 |
| VAD180L020S08-S-M10 | 11.7 | 18 | 20 | 20 | 12 | S08 | M10 | 13 |
| VAD180L025S08-S-M10 | 11.7 | 18 | 25 | 20 | 15 | S08 | M10 | 11 |
| VAD210L020S08-S-M12 | 11.7 | 21 | 20 | 20 | 10 | S08 | M12 | 12.75 |
| VAD210L025S08-S-M12 | 11.7 | 21 | 25 | 20 | 13 | S08 | M12 | 12.75 |

• Wrench size, used on flats for tightening (not supplied). • Do not apply lubricant to the threaded connection.

# TUNGFLEX
## CDP-ER-M

TungFlex adaptor with ER collet chucks

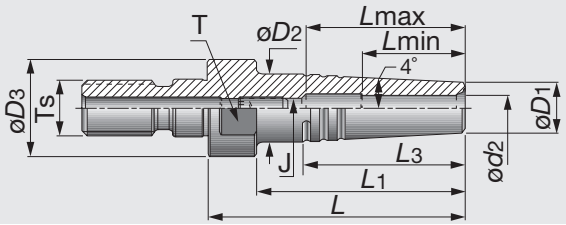



| Designation | Ts | CSI | Range | $L_1$ | $L_2$ | $øD_3$ | T |
|---|---|---|---|---|---|---|---|
| CDPER11M10M | M10 | ER11 | 0.5-7 | 27 | 20 | 16 | 15 |
| CDPER16M10M | M10 | ER16 | 0.5-10 | 38.1 | 20 | 22 | 17 |
| CDPER11M12M | M12 | ER11 | 0.5-7 | 27 | 22 | 16 | 17 |
| CDPER16M12M | M12 | ER16 | 0.5-10 | 37.1 | 22 | 22 | 17 |
| CDPER16M16 | M16 | ER16 | 0.5-10 | 36.6 | 25 | 28 | 25 |
| CDPER20M16 | M16 | ER20 | 1-13 | 45.5 | 25 | 34 | 25 |
| CDPER25M16 | M16 | ER25 | 1-16 | 44.5 | 25 | 42 | 28 |

Option (Wrench for ER collet)

# TUNGFLEX
## CDP-M-SRK

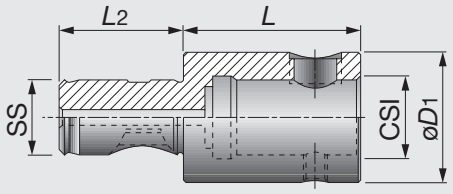
TungFlex adaptor with shrinking holder for carbide shank




| Designation | Ts | $øD_3$ | $ød_2$ | $øD_1$ | $øD_2$ | L | $L_1$ | $L_3$ | Lmin | Lmax | J | T | key |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CDPM10SRK3X40 | M10 | 18 | 3 | 10 | 14 | 40 | 31.5 | 28.4 | 10 | 16 | M4 | 15 | 2 |
| CDPM10SRK4X40 | M10 | 18 | 4 | 10 | 14 | 40 | 31.5 | 28.4 | 12 | 19 | M4 | 15 | 2 |
| CDPM10SRK5X40 | M10 | 18 | 5 | 10 | 14 | 40 | 31.5 | 28.4 | 15 | 25 | M4 | 15 | 2 |
| CDPM12SRK3X45 | M12 | 21 | 3 | 10 | 14 | 45 | 36.5 | 28.8 | 10 | 16 | M5 | 18 | 2.5 |
| CDPM12SRK4X45 | M12 | 21 | 4 | 10 | 14 | 45 | 36.5 | 28.8 | 12 | 18 | M5 | 18 | 2.5 |
| CDPM12SRK5X45 | M12 | 21 | 5 | 10 | 14 | 45 | 36.5 | 28.8 | 15 | 25 | M5 | 18 | 2.5 |
| CDPM12SRK6X45 | M12 | 21 | 6 | 11 | 15 | 45 | 36.5 | 28.4 | 18 | 28 | M5 | 18 | 2.5 |
| CDPM12SRK8X45 | M12 | 21 | 8 | 14 | 18 | 45 | 36.5 | 28.8 | 25 | 35 | M5 | 18 | 2.5 |
| CDPM12SRK10X45 | M12 | 21 | 10 | 16 | 21 | 45 | - | 35.6 | 30 | 40 | M5 | 18 | 2.5 |
| CDPM12SRK12X45 | M12 | 21 | 12 | 20 | 25 | 45 | - | 36.0 | 32 | 42 | M5 | 18 | 2.5 |

## TUNGFIT
### EX-CF extension

TungFit extension adaptor

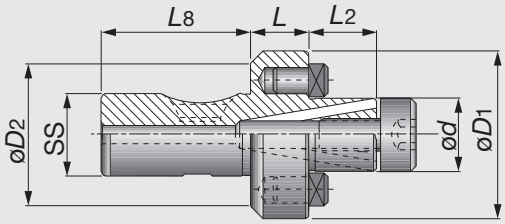



| Designation | SS | L2 | L | CSI | øD1 |
|---|---|---|---|---|---|
| EXCF4-S | CF4 | 42 | 60 | CF4 | 44 |
| EXCF4-L | CF4 | 42 | 100 | CF4 | 44 |

• Tightening torque: 58.8 N·m.

## TUNGFIT
### SEM-CF

TungFit shell mill adaptor



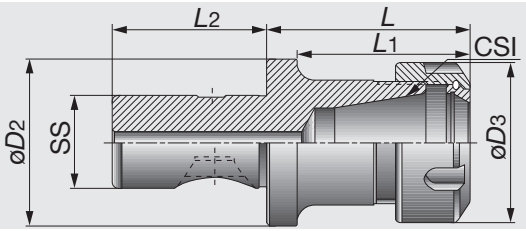

| Designation | SS | ød | øD2 | øD1 | L | L2 | L8 |
|---|---|---|---|---|---|---|---|
| SEM22CF4C | CF4 | 22 | 44 | 47 | 16 | 19 | 42 |

• Tightening torque: 58.8 N·m.

(Option Wrench for Lock Screw)

## TUNGFIT
### ER-CF

TungFit collet chuck adaptor




| Designation | SS | CSI | Range | L | L1 | L2 | øD3 | øD2 |
|---|---|---|---|---|---|---|---|---|
| ER11CF4-S | CF4 | ER11 | 0.5-7 | 55 | 47 | 42 | 19 | 44 |
| ER16CF4-L | CF4 | ER16 | 0.5-10 | 100 | 92 | 42 | 28 | 44 |
| ER16CF4-S | CF4 | ER16 | 0.5-10 | 55 | 47 | 42 | 28 | 44 |
| ER20CF4-S | CF4 | ER20 | 1-13 | 55 | 92 | 42 | 34 | 44 |
| ER25CF4-S | CF4 | ER25 | 1-16 | 55 | 47 | 42 | 42 | 44 |
| ER32CF4-L | CF4 | ER32 | 2-20 | 100 | 92 | 42 | 50 | 44 |
| ER32CF4-S | CF4 | ER32 | 2-20 | 55 | 47 | 42 | 50 | 44 |

• Tightening torque: 58.8 N·m.

(Option Wrench for ER collet)

## Shanks

**DIN69871**



**ST Straight Shank**



**MT Morse Taper**



## Collet Options

**ER-SPR (ER Spring Collet)**



**ER-SEAL**
**(ER SEAL Collet for Internal coolant)**



**ER-SEAL JET2**
**(ER SEAL Collet for External coolant)**



**ER-SRK**
**(ER Collet with SHRINK Holder)**

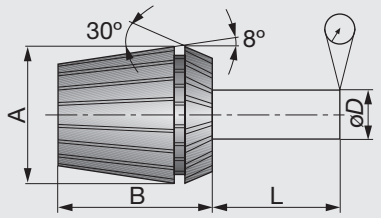


**ER32 GTIN**
**(ER Collet with Tapping Holder)**



**ER32 ODP**
**(ER Collet with Indexable Modular System)**






| Designation | A | B | L | øD | T.I.R Precision Standard type | T.I.R Precision "AA" Ultra Precision type |
|---|---|---|---|---|---|---|
| ER-11 | 11.5 | 18 | 6 | 1-1.6 | 0.01 | 0.005 |
| ER-16 | 17 | 27 | 10 | 1.6-3 | 0.01 | 0.005 |
| ER-20 | 21 | 31 | 16 | 3-6 | 0.01 | 0.005 |
| ER-25 | 26 | 35 | 25 | 6-10 | 0.01 | 0.005 |
| ER-32 | 33 | 40 | 40 | 10-18 | 0.01 | 0.005 |
| ER-40 | 41 | 46 | 50 | 18-26 | 0.01 | 0.005 |
| ER-50 | 52 | 60 | 60 | 26-34 | 0.01 | - |

ER 50 DIN6499

## ER - Coolit Sealed Collet



### Sealed Collet Jet

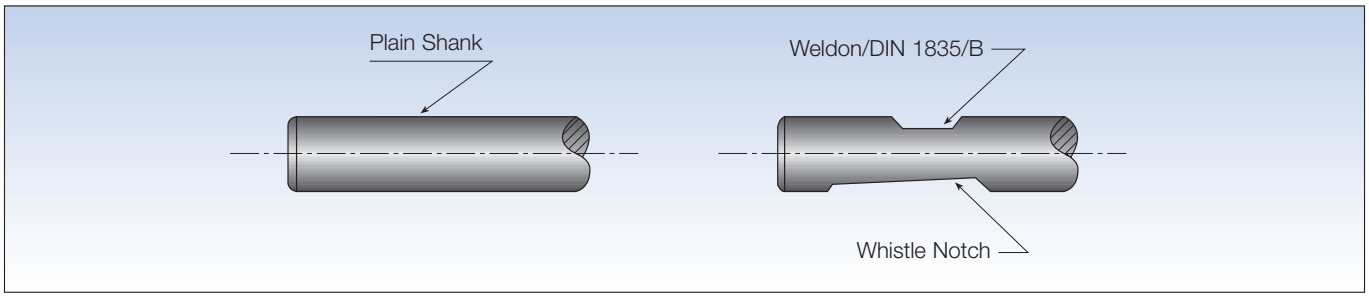
For straight shank cutting tools with internal coolant supply.



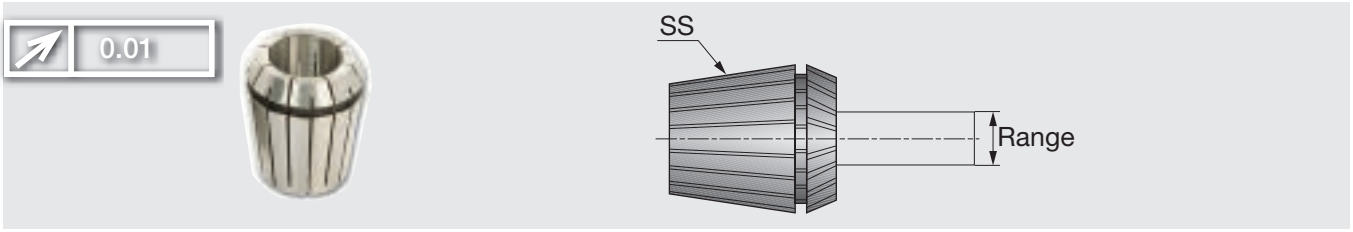
### Sealed Collet JET2

With angular double nozzles. Coolant flow is direct to the cutting edge - for use with standard straight shank cutting tools (without coolant hole).

## Standard Shank which can be used in Sealed Collets




Note: The front end of the sealed collet should be located beyond weldon or the whistle notch.

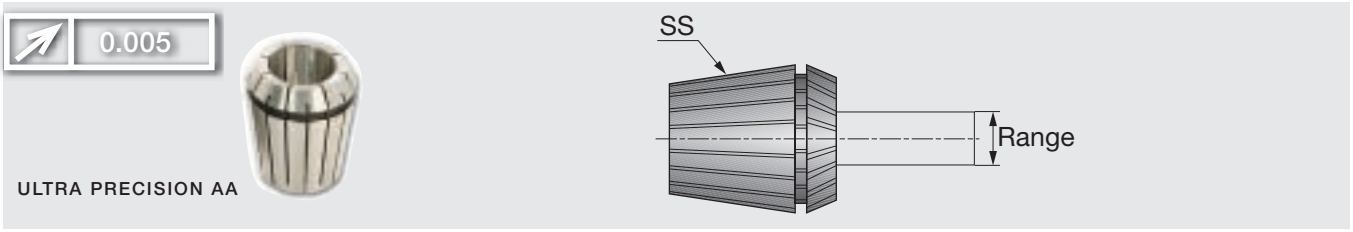



| Designation | SS | Range |
|---|---|---|
| ER11SPR0.5-1 | ER11 | 0.5-1 |
| ER11SPR1-2 | ER11 | 1-2 |
| ER11SPR2-3 | ER11 | 2-3 |
| ER11SPR3-4 | ER11 | 3-4 |
| ER11SPR4-5 | ER11 | 4-5 |
| ER11SPR5-6 | ER11 | 5-6 |
| ER11SPR6-7 | ER11 | 6-7 |
| ER16SPR0.5-1 | ER16 | 0.5-1 |
| ER16SPR1-2 | ER16 | 1-2 |
| ER16SPR2-3 | ER16 | 2-3 |
| ER16SPR3-4 | ER16 | 3 |
| ER16SPR4-5 | ER16 | 4-5 |
| ER16SPR5-6 | ER16 | 5-6 |
| ER16SPR6-7 | ER16 | 6-7 |
| ER16SPR7-8 | ER16 | 7-8 |
| ER16SPR8-9 | ER16 | 8-9 |
| ER16SPR9-10 | ER16 | 9-10 |
| ER20SPR1-2 | ER20 | 1-2 |
| ER20SPR2-3 | ER20 | 2-3 |
| ER20SPR3-4 | ER20 | 3-4 |
| ER20SPR4-5 | ER20 | 4-5 |
| ER20SPR5-6 | ER20 | 5-6 |
| ER20SPR6-7 | ER20 | 6-7 |
| ER20SPR7-8 | ER20 | 7-8 |
| ER20SPR8-9 | ER20 | 8-9 |
| ER20SPR9-10 | ER20 | 9-10 |
| ER20SPR10-11 | ER20 | 10-11 |
| ER20SPR11-12 | ER20 | 11-12 |
| ER20SPR12-13 | ER20 | 12-13 |
| ER25SPR1-2 | ER25 | 1-2 |
| ER25SPR2-3 | ER25 | 2-3 |
| ER25SPR3-4 | ER25 | 3-4 |
| ER25SPR4-5 | ER25 | 4-5 |
| ER25SPR5-6 | ER25 | 5-6 |
| ER25SPR6-7 | ER25 | 6-7 |
| ER25SPR7-8 | ER25 | 7-8 |
| ER25SPR8-9 | ER25 | 8-9 |
| ER25SPR9-10 | ER25 | 9-10 |
| ER25SPR10-11 | ER25 | 10-11 |
| ER25SPR11-12 | ER25 | 11-12 |
| ER25SPR12-13 | ER25 | 12-13 |
| ER25SPR13-14 | ER25 | 13-14 |
| ER25SPR14-15 | ER25 | 14-15 |
| ER25SPR15-16 | ER25 | 15-16 |
| ER32SPR2-3 | ER32 | 2-3 |
| ER32SPR3-4 | ER32 | 3-4 |
| ER32SPR4-5 | ER32 | 4-5 |
| ER32SPR5-6 | ER32 | 5-6 |
| ER32SPR6-7 | ER32 | 6-7 |
| ER32SPR7-8 | ER32 | 7-8 |
| ER32SPR8-9 | ER32 | 8-9 |
| ER32SPR9-10 | ER32 | 9-10 |
| ER32SPR10-11 | ER32 | 10-11 |

| Designation | SS | Range |
|---|---|---|
| ER32SPR11-12 | ER32 | 11-12 |
| ER32SPR12-13 | ER32 | 12-13 |
| ER32SPR13-14 | ER32 | 13-14 |
| ER32SPR14-15 | ER32 | 14-15 |
| ER32SPR15-16 | ER32 | 15-16 |
| ER32SPR16-17 | ER32 | 16-17 |
| ER32SPR17-18 | ER32 | 17-18 |
| ER32SPR18-19 | ER32 | 18-19 |
| ER32SPR19-20 | ER32 | 19-20 |
| ER40SPR3-4 | ER40 | 3-4 |
| ER40SPR4-5 | ER40 | 4-5 |
| ER40SPR5-6 | ER40 | 5-6 |
| ER40SPR6-7 | ER40 | 6-7 |
| ER40SPR7-8 | ER40 | 7-8 |
| ER40SPR8-9 | ER40 | 8-9 |
| ER40SPR9-10 | ER40 | 9-10 |
| ER40SPR10-11 | ER40 | 10-11 |
| ER40SPR11-12 | ER40 | 11-12 |
| ER40SPR12-13 | ER40 | 12-13 |
| ER40SPR13-14 | ER40 | 13-14 |
| ER40SPR14-15 | ER40 | 14-15 |
| ER40SPR15-16 | ER40 | 15-16 |
| ER40SPR16-17 | ER40 | 16-17 |
| ER40SPR17-18 | ER40 | 17-18 |
| ER40SPR18-19 | ER40 | 18-19 |
| ER40SPR19-20 | ER40 | 19-20 |
| ER40SPR20-21 | ER40 | 20-21 |
| ER40SPR21-22 | ER40 | 21-22 |
| ER40SPR22-23 | ER40 | 22-23 |
| ER40SPR23-24 | ER40 | 23-24 |
| ER40SPR24-25 | ER40 | 24-25 |
| ER40SPR25-26 | ER40 | 25-26 |
| ER50SPR10-12 | ER50 | 10-12 |
| ER50SPR12-14 | ER50 | 12-14 |
| ER50SPR14-16 | ER50 | 14-16 |
| ER50SPR16-18 | ER50 | 16-18 |
| ER50SPR18-20 | ER50 | 18-20 |
| ER50SPR20-22 | ER50 | 20-22 |
| ER50SPR22-24 | ER50 | 22-24 |
| ER50SPR24-26 | ER50 | 24-26 |
| ER50SPR26-28 | ER50 | 26-28 |
| ER50SPR28-30 | ER50 | 28-30 |
| ER50SPR30-32 | ER50 | 30-32 |
| ER50SPR32-34 | ER50 | 32-34 |

# ER-SPR-AA

## DIN 6499 'AA' Ultra Precise ER Spring Collets

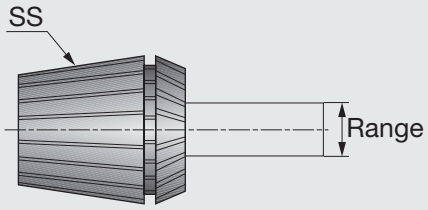



| Designation | SS | Range |
|---|---|---|
| ER11SPR0.5-1AA | ER11 | 0.5-1 |
| ER11SPR1-2AA | ER11 | 1-2 |
| ER11SPR2-3AA | ER11 | 2-3 |
| ER11SPR3-4AA | ER11 | 3-4 |
| ER11SPR4-5AA | ER11 | 4-5 |
| ER11SPR5-6AA | ER11 | 5-6 |
| ER11SPR6-7AA | ER11 | 6-7 |
| ER16SPR0.5-1AA | ER16 | 0.5-1 |
| ER16SPR1-2AA | ER16 | 1-2 |
| ER16SPR2-3AA | ER16 | 2-3 |
| ER16SPR3-4AA | ER16 | 3-4 |
| ER16SPR4-5AA | ER16 | 4-5 |
| ER16SPR5-6AA | ER16 | 5-6 |
| ER16SPR6-7AA | ER16 | 6-7 |
| ER16SPR7-8AA | ER16 | 7-8 |
| ER16SPR8-9AA | ER16 | 8-9 |
| ER16SPR9-10AA | ER16 | 9-10 |
| ER20SPR12-13AA | ER20 | 12-13 |
| ER20SPR2-3AA | ER20 | 2-3 |
| ER20SPR3-4AA | ER20 | 3-4 |
| ER20SPR4-5AA | ER20 | 4-5 |
| ER20SPR5-6AA | ER20 | 5-6 |
| ER20SPR6-7AA | ER20 | 6-7 |
| ER20SPR7-8AA | ER20 | 7-8 |
| ER20SPR8-9AA | ER20 | 8-9 |
| ER20SPR9-10AA | ER20 | 9-10 |
| ER20SPR1-2AA | ER20 | 1-2 |
| ER20SPR10-11AA | ER20 | 10-11 |
| ER20SPR11-12AA | ER20 | 11-12 |
| ER25SPR12-13AA | ER25 | 12-13 |
| ER25SPR2-3AA | ER25 | 2-3 |
| ER25SPR3-4AA | ER25 | 3-4 |
| ER25SPR4-5AA | ER25 | 4-5 |
| ER25SPR5-6AA | ER25 | 5-6 |
| ER25SPR6-7AA | ER25 | 6-7 |
| ER25SPR7-8AA | ER25 | 7-8 |
| ER25SPR8-9AA | ER25 | 8-9 |
| ER25SPR9-10AA | ER25 | 9-10 |
| ER25SPR1-2AA | ER25 | 1-2 |
| ER25SPR10-11AA | ER25 | 10-11 |
| ER25SPR11-12AA | ER25 | 11-12 |
| ER25SPR13-14AA | ER25 | 13-14 |
| ER25SPR14-15AA | ER25 | 14-15 |
| ER25SPR15-16AA | ER25 | 15-16 |
| ER32SPR2-3AA | ER32 | 2-3 |
| ER32SPR3-4AA | ER32 | 3-4 |
| ER32SPR4-5AA | ER32 | 4-5 |
| ER32SPR5-6AA | ER32 | 5-6 |
| ER32SPR6-7AA | ER32 | 6-7 |
| ER32SPR7-8AA | ER32 | 7-8 |
| ER32SPR8-9AA | ER32 | 8-9 |
| ER32SPR9-10AA | ER32 | 9-10 |
| ER32SPR10-11AA | ER32 | 10-11 |

| Designation | SS | Range |
|---|---|---|
| ER32SPR11-12AA | ER32 | 11-12 |
| ER32SPR12-13AA | ER32 | 12-13 |
| ER32SPR13-14AA | ER32 | 13-14 |
| ER32SPR14-15AA | ER32 | 14-15 |
| ER32SPR15-16AA | ER32 | 15-16 |
| ER32SPR16-17AA | ER32 | 16-17 |
| ER32SPR17-18AA | ER32 | 17-18 |
| ER32SPR18-19AA | ER32 | 18-19 |
| ER32SPR19-20AA | ER32 | 19-20 |
| ER40SPR3-4AA | ER40 | 3-4 |
| ER40SPR4-5AA | ER40 | 4-5 |
| ER40SPR5-6AA | ER40 | 5-6 |
| ER40SPR6-7AA | ER40 | 6-7 |
| ER40SPR7-8AA | ER40 | 7-8 |
| ER40SPR8-9AA | ER40 | 8-9 |
| ER40SPR9-10AA | ER40 | 9-10 |
| ER40SPR10-11AA | ER40 | 10-11 |
| ER40SPR11-12AA | ER40 | 11-12 |
| ER40SPR12-13AA | ER40 | 12-13 |
| ER40SPR13-14AA | ER40 | 13-14 |
| ER40SPR14-15AA | ER40 | 14-15 |
| ER40SPR15-16AA | ER40 | 15-16 |
| ER40SPR16-17AA | ER40 | 16-17 |
| ER40SPR17-18AA | ER40 | 17-18 |
| ER40SPR18-19AA | ER40 | 18-19 |
| ER40SPR19-20AA | ER40 | 19-20 |
| ER40SPR20-21AA | ER40 | 20-21 |
| ER40SPR21-22AA | ER40 | 21-22 |
| ER40SPR22-23AA | ER40 | 22-23 |
| ER40SPR23-24AA | ER40 | 23-24 |
| ER40SPR24-25AA | ER40 | 24-25 |
| ER40SPR25-26AA | ER40 | 25-26 |

## DIN 6499 ER COOLIT, Sealed Spring Collets



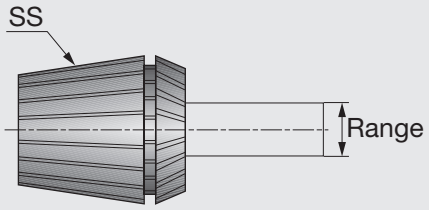



| Designation | SS | Range |
|---|---|---|
| ER16SEAL3-4 | ER16 | 3-4 |
| ER16SEAL4-5 | ER16 | 4-5 |
| ER16SEAL5-6 | ER16 | 5-6 |
| ER16SEAL6-7 | ER16 | 6-7 |
| ER16SEAL7-8 | ER16 | 7-8 |
| ER16SEAL8-9 | ER16 | 8-9 |
| ER16SEAL9-10 | ER16 | 9-10 |
| ER20SEAL3-4 | ER20 | 3-4 |
| ER20SEAL4-5 | ER20 | 4-5 |
| ER20SEAL5-6 | ER20 | 5-6 |
| ER20SEAL6-7 | ER20 | 6-7 |
| ER20SEAL7-8 | ER20 | 7-8 |
| ER20SEAL8-9 | ER20 | 8-9 |
| ER20SEAL9-10 | ER20 | 9-10 |
| ER20SEAL10-11 | ER20 | 10-11 |
| ER20SEAL11-12 | ER20 | 11-12 |
| ER20SEAL12-13 | ER20 | 12-13 |
| ER25SEAL3-4 | ER25 | 3-4 |
| ER25SEAL4-5 | ER25 | 4-5 |
| ER25SEAL5-6 | ER25 | 5-6 |
| ER25SEAL6-7 | ER25 | 6-7 |
| ER25SEAL7-8 | ER25 | 7-8 |
| ER25SEAL8-9 | ER25 | 8-9 |
| ER25SEAL9-10 | ER25 | 9-10 |
| ER25SEAL10-11 | ER25 | 10-11 |
| ER25SEAL11-12 | ER25 | 11-12 |
| ER25SEAL12-13 | ER25 | 12-13 |
| ER25SEAL13-14 | ER25 | 13-14 |
| ER25SEAL14-15 | ER25 | 14-15 |
| ER25SEAL15-16 | ER25 | 15-16 |
| ER32SEAL3-4 | ER32 | 3-4 |
| ER32SEAL4-5 | ER32 | 4-5 |
| ER32SEAL5-6 | ER32 | 5-6 |
| ER32SEAL6-7 | ER32 | 6-7 |
| ER32SEAL7-8 | ER32 | 7-8 |
| ER32SEAL8-9 | ER32 | 8-9 |
| ER32SEAL9-10 | ER32 | 9-10 |
| ER32SEAL10-11 | ER32 | 10-11 |
| ER32SEAL11-12 | ER32 | 11-12 |
| ER32SEAL12-13 | ER32 | 12-13 |
| ER32SEAL13-14 | ER32 | 13-14 |
| ER32SEAL14-15 | ER32 | 14-15 |
| ER32SEAL15-16 | ER32 | 15-16 |
| ER32SEAL16-17 | ER32 | 16-17 |
| ER32SEAL17-18 | ER32 | 17-18 |
| ER32SEAL18-19 | ER32 | 18-19 |
| ER32SEAL19-20 | ER32 | 19-20 |
| ER40SEAL3-4 | ER40 | 3-4 |
| ER40SEAL4-5 | ER40 | 4-5 |
| ER40SEAL5-6 | ER40 | 5-6 |
| ER40SEAL6-7 | ER40 | 6-7 |
| ER40SEAL7-8 | ER40 | 7-8 |
| ER40SEAL8-9 | ER40 | 8-9 |

| Designation | SS | Range |
|---|---|---|
| ER40SEAL9-10 | ER40 | 9-10 |
| ER40SEAL10-11 | ER40 | 10-11 |
| ER40SEAL11-12 | ER40 | 11-12 |
| ER40SEAL12-13 | ER40 | 12-13 |
| ER40SEAL13-14 | ER40 | 13-14 |
| ER40SEAL14-15 | ER40 | 14-15 |
| ER40SEAL15-16 | ER40 | 15-16 |
| ER40SEAL16-17 | ER40 | 16-17 |
| ER40SEAL17-18 | ER40 | 17-18 |
| ER40SEAL18-19 | ER40 | 18-19 |
| ER40SEAL19-20 | ER40 | 19-20 |
| ER40SEAL20-21 | ER40 | 20-21 |
| ER40SEAL21-22 | ER40 | 21-22 |
| ER40SEAL22-23 | ER40 | 22-23 |
| ER40SEAL23-24 | ER40 | 23-24 |
| ER40SEAL24-25 | ER40 | 24-25 |
| ER40SEAL25-26 | ER40 | 25-26 |

DIN 6499 ER COOLIT, Sealed Collets with Cooling Jets






| Designation | SS | Range |
|---|---|---|
| ER16SEAL3-4JET2 | ER16 | 3-4 |
| ER16SEAL4-5JET2 | ER16 | 4-5 |
| ER16SEAL5-6JET2 | ER16 | 5-6 |
| ER16SEAL6-7JET2 | ER16 | 6-7 |
| ER16SEAL7-8JET2 | ER16 | 7-8 |
| ER16SEAL8-9JET2 | ER16 | 8-9 |
| ER16SEAL9-10JET2 | ER16 | 9-10 |
| ER20SEAL3-4JET2 | ER20 | 3-4 |
| ER20SEAL4-5JET2 | ER20 | 4-5 |
| ER20SEAL5-6JET2 | ER20 | 5-6 |
| ER20SEAL6-7JET2 | ER20 | 6-7 |
| ER20SEAL7-8JET2 | ER20 | 7-8 |
| ER20SEAL8-9JET2 | ER20 | 8-9 |
| ER20SEAL9-10JET2 | ER20 | 9-10 |
| ER20SEAL10-11JET2 | ER20 | 10-11 |
| ER20SEAL11-12JET2 | ER20 | 11-12 |
| ER20SEAL12-13JET2 | ER20 | 12-13 |
| ER25SEAL3-4JET2 | ER25 | 3-4 |
| ER25SEAL4-5JET2 | ER25 | 4-5 |
| ER25SEAL5-6JET2 | ER25 | 5-6 |
| ER25SEAL6-7JET2 | ER25 | 6-7 |
| ER25SEAL7-8JET2 | ER25 | 7-8 |
| ER25SEAL8-9JET2 | ER25 | 8-9 |
| ER25SEAL9-10JET2 | ER25 | 9-10 |
| ER25SEAL10-11JET2 | ER25 | 10-11 |
| ER25SEAL11-12JET2 | ER25 | 11-12 |
| ER25SEAL12-13JET2 | ER25 | 12-13 |
| ER25SEAL13-14JET2 | ER25 | 13-14 |
| ER25SEAL14-15JET2 | ER25 | 14-15 |
| ER25SEAL15-16JET2 | ER25 | 15-16 |
| ER32SEAL3-4JET2 | ER32 | 3-4 |
| ER32SEAL4-5JET2 | ER32 | 4-5 |
| ER32SEAL5-6JET2 | ER32 | 5-6 |
| ER32SEAL6-7JET2 | ER32 | 6-7 |
| ER32SEAL7-8JET2 | ER32 | 7-8 |
| ER32SEAL8-9JET2 | ER32 | 8-9 |
| ER32SEAL9-10JET2 | ER32 | 9-10 |
| ER32SEAL10-11JET2 | ER32 | 10-11 |
| ER32SEAL11-12JET2 | ER32 | 11-12 |
| ER32SEAL12-13JET2 | ER32 | 12-13 |
| ER32SEAL13-14JET2 | ER32 | 13-14 |
| ER32SEAL14-15JET2 | ER32 | 14-15 |
| ER32SEAL15-16JET2 | ER32 | 15-16 |
| ER32SEAL16-17JET2 | ER32 | 16-17 |
| ER32SEAL17-18JET2 | ER32 | 17-18 |
| ER32SEAL18-19JET2 | ER32 | 18-19 |
| ER32SEAL19-20JET2 | ER32 | 19-20 |
| ER40SEAL3-4JET2 | ER40 | 3-4 |
| ER40SEAL4-5JET2 | ER40 | 4-5 |
| ER40SEAL5-6JET2 | ER40 | 5-6 |
| ER40SEAL6-7JET2 | ER40 | 6-7 |
| ER40SEAL7-8JET2 | ER40 | 7-8 |
| ER40SEAL8-9JET2 | ER40 | 8-9 |

| Designation | SS | Range |
|---|---|---|
| ER40SEAL9-10JET2 | ER40 | 9-10 |
| ER40SEAL10-11JET2 | ER40 | 10-11 |
| ER40SEAL11-12JET2 | ER40 | 11-12 |
| ER40SEAL12-13JET2 | ER40 | 12-13 |
| ER40SEAL13-14JET2 | ER40 | 13-14 |
| ER40SEAL14-15JET2 | ER40 | 14-15 |
| ER40SEAL15-16JET2 | ER40 | 15-16 |
| ER40SEAL16-17JET2 | ER40 | 16-17 |
| ER40SEAL17-18JET2 | ER40 | 17-18 |
| ER40SEAL18-19JET2 | ER40 | 18-19 |
| ER40SEAL19-20JET2 | ER40 | 19-20 |
| ER40SEAL20-21JET2 | ER40 | 20-21 |
| ER40SEAL21-22JET2 | ER40 | 21-22 |
| ER40SEAL22-23JET2 | ER40 | 22-23 |
| ER40SEAL23-24JET2 | ER40 | 23-24 |
| ER40SEAL24-25JET2 | ER40 | 24-25 |
| ER40SEAL25-26JET2 | ER40 | 25-26 |

## TUNGHOLD
### SET ER-SPR

Sets of DIN 6499 ER spring collets with hard touch coating



| Designation | SS | Qty | Range |
|---|---|---|---|
| SETER11SPR7 | ER11 | 7 | 0.5-7 |
| SETER16SPR10 | ER16 | 10 | 0.5-10 |
| SETER20SPR12 | ER20 | 12 | 1-13 |
| SETER25SPR15 | ER25 | 15 | 1-16 |
| SETER32SPR18 | ER32 | 18 | 2-20 |
| SETER40SPR23 | ER40 | 23 | 3-26 |
| SETER50SPR12 | ER50 | 12 | 10-34 |

## TUNGHOLD
### SET ER-SPR-AA

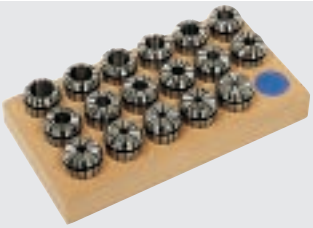
Sets of DIN 6499 ER 'AA' ultra precise spring collets with hard touch coating



| Designation | SS | Qty | Range |
|---|---|---|---|
| SETER11SPR7AA | ER11 | 7 | 0.5-7 |
| SETER16SPR10AA | ER16 | 10 | 0.5-10 |
| SETER20SPR12AA | ER20 | 12 | 1-13 |
| SETER25SPR15AA | ER25 | 15 | 1-16 |
| SETER32SPR18AA | ER32 | 18 | 2-20 |
| SETER40SPR23AA | ER40 | 23 | 3-26 |

## TUNGHOLD
### SET ER-SEAL

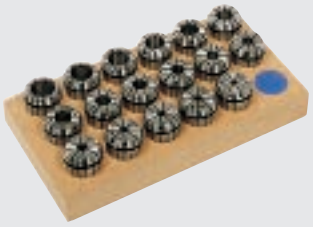
Sets of DIN 6499 ER coolit collets with hard touch coating, sealed for 100 bar



| Designation | SS | Qty | Range |
|---|---|---|---|
| SETER16SEAL7 | ER16 | 7 | 3-10 |
| SETER20SEAL10 | ER20 | 10 | 3-13 |
| SETER25SEAL13 | ER25 | 13 | 3-16 |
| SETER32SEAL17 | ER32 | 17 | 3-20 |
| SETER40SEAL23 | ER40 | 23 | 3-26 |

## TUNGHOLD
### SET ER-SEAL-JET2

Sets of ER collet, sealed for 1450 PSI collets with hard touch coating. sealed for 100 bar



| Designation | SS | Qty | Range |
|---|---|---|---|
| SETER16SEAL7JET2 | ER16 | 7 | 3-13 |
| SETER25SEAL13JET2 | ER25 | 13 | 3-20 |
| SETER32SEAL17JET2 | ER32 | 17 | 3-26 |
| SETER40SEAL23JET2 | ER40 | 23 | 3-26 |

## TUNGHOLD
### SET ER SPR-EM(1)

Sets of ER spring collets DIN 6499 with hard touch coating



| Designation | SS | Qty | Range |
|---|---|---|---|
| SETER16SPR8EM | ER16 | 8 | 3,4,5,6,7,8,9,10 |
| SETER20SPR5EM | ER20 | 5 | 4,6,8,10,12 |
| SETER25SPR6EM | ER25 | 6 | 4,6,8,10,12,16 |
| SETER32SPR6EM | ER32 | 6 | 6,8,10,12,16,20 |
| SETER40SPR7EM | ER40 | 7 | 6,8,10,12,16,20,25 |

(1) Contains popular endmill sizes only.

## TUNGHOLD
### SET-ER SEAL-EM(1)

A Set of ER collet, JET collets, sealed for up to 100 bap.the hard touch coating, sealed for 100 bar

| Designation | SS | Qty | Range |
|---|---|---|---|
| SETER16SEAL5EM | ER16 | 5 | 4,5,6,8,10 |
| SETER20SEAL5EM | ER20 | 5 | 4,6,8,10,12 |
| SETER25SEAL6EM | ER25 | 6 | 4,6,8,10,12,16 |
| SETER32SEAL6EM | ER32 | 6 | 6,8,10,12,16,20 |
| SETER40SEAL7EM | ER40 | 7 | 6,8,10,12,16,20,25 |

(1) Contains popular endmill sizes only.

## TUNGHOLD
### SET ER-SEAL-EM JET2(1)

A set of ER collet, JET2 collets, sealed for up to 100 bar

| Designation | SS | Qty | Range |
|---|---|---|---|
| SETER25SEAL6EMJET2 | ER25 | 6 | 4,6,8,10,12,16 |
| SETER32SEAL6EMJET2 | ER32 | 6 | 6,8,10,12,16,20 |
| SETER40SEAL7EMJET2 | ER40 | 7 | 6,8,10,12,16,20,25 |

(1) Contains popular endmill sizes only.

## TUNGHOLD
### KIT R-8-ER

The Kit contains ER collet chuck with a bridgeport shank and a set of collets in various bore sizes



| Designation | SS | Qty | Range |
|---|---|---|---|
| KITR-810ER16 | ER16 | 10 | 0.5-10 |
| KITR-818ER32 | ER32 | 18 | 2-20 |

• Each kit contains one collet chuck, a full set of ER collets and a Wrench.

## TUNGHOLD
### KIT DIN2080-ER

The Kit contains 1 DIN 2080 taper shank with ER collet chuck and a set of ER spring collets



| Designation | SS | Qty | Range |
|---|---|---|---|
| KITDIN20803018ER32 | ER32 | 18 | 2-20 |
| KITDIN20804018ER32 | ER32 | 18 | 2-20 |
| KITDIN20804023ER40 | ER40 | 23 | 3-26 |
| KITDIN20805023ER40 | ER40 | 23 | 3-26 |

• Each kit contains one collet chuck, a full set of ER collets and a Wrench.

TUNGHOLD

## KIT MT-ER

The Kit contains ER collet chuck with a morse taper shank and a set of collets in various bore sizes



| Designation | SS | Qty | Range |
|---|---|---|---|
| KITMT318ER32 | ER32 | 18 | 2-20 |
| KITMT423ER40 | ER40 | 23 | 3-26 |

• Each kit contains one collet chuck, a full set of ER collets and a Wrench.

TUNGHOLD

## KIT ST-ER-Mini

The Kits contains ER Mini collet chuck with a cylindrical shank and a set of collets in various bore sizes



| Designation | SS | Qty | Range |
|---|---|---|---|
| KITST12X807ER11M | ER11 | 7 | 0.5-7 |
| KITST12X8010ER16M | ER16 | 10 | 0.5-10 |
| KITST16X507ER11MF | ER11 | 7 | 0.5-7 |
| KITST16X1007ER11M | ER11 | 7 | 0.5-7 |
| KITST16X1507ER11M | ER11 | 7 | 0.5-7 |
| KITST20X10010ER16M | ER16 | 10 | 0.5-10 |
| KITST20X15010ER16M | ER16 | 10 | 0.5-10 |
| KITST20X10012ER20M | ER20 | 12 | 1-12 |
| KITST20X15012ER20M | ER20 | 12 | 1-12 |

• Each kit contains one collet chuck, a full set of ER collets and a Wrench. • F indicates a flat on the shank.

# TUNGHOLD

## KIT ST-ER

Contains 1 ER collet chuck with a cylindrical shank and a set of collets in various bore sizes



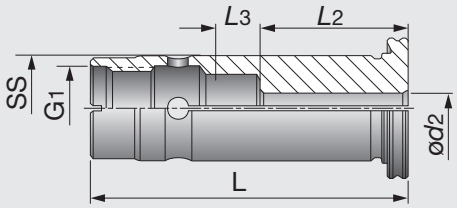
| Designation | SS | Qty | Range |
|---|---|---|---|
| KITST16X507ER11F | ER11 | 7 | 0.5-7 |
| KITST20X1007ER11 | ER11 | 7 | 0.5-7 |
| KITST20X1507ER11 | ER11 | 7 | 0.5-7 |
| KITST20X5010ER16F | ER16 | 10 | 0.5-10 |
| KITST20X10010ER16 | ER16 | 10 | 0.5-10 |
| KITST20X15010ER16 | ER16 | 10 | 0.5-10 |
| KITST20X5012ER20F | ER20 | 12 | 1-12 |
| KITST25X10012ER20 | ER20 | 12 | 1-12 |

• Each kit contains one collet chuck, a full set of ER collets and a Wrench. • F indicates a flat on the shank.

# TUNGMAX

## SC-SPR

SC straight collets for tungMax power chucks

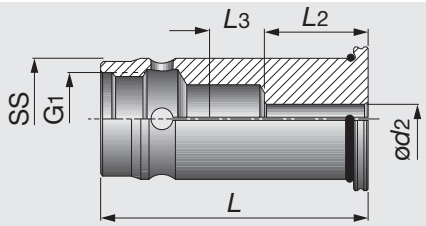



| Designation | ød2 | SS | L | L2 | L3 | G1 |
|---|---|---|---|---|---|---|
| SC20SPR6 | 6 | 20 | 60 | 28 | 7 | M16 |
| SC20SPR8 | 8 | 20 | 60 | 28 | 7 | M16 |
| SC20SPR10 | 10 | 20 | 60 | 35 | 13 | M16 |
| SC20SPR12 | 12 | 20 | 60 | 40 | 8 | M16 |
| SC20SPR14 | 14 | 20 | 60 | 40 | 8 | M16 |
| SC20SPR15 | 15 | 20 | 60 | 40 | 8 | M16 |
| SC20SPR16 | 16 | 20 | 60 | 39 | 9 | M16 |
| SC32SPR6 | 6 | 32 | 72 | 28 | 17 | M24X1.5 |
| SC32SPR8 | 8 | 32 | 72 | 28 | 17 | M24X1.5 |
| SC32SPR10 | 10 | 32 | 72 | 35 | 13 | M24X1.5 |
| SC32SPR12 | 12 | 32 | 72 | 40 | 5 | M24X1.5 |
| SC32SPR14 | 14 | 32 | 72 | 40 | 5 | M24X1.5 |
| SC32SPR15 | 15 | 32 | 72 | 40 | 19.5 | M24X1.5 |
| SC32SPR16 | 16 | 32 | 72 | 44 | 17.5 | M24X1.5 |
| SC32SPR18 | 18 | 32 | 72 | 44 | 17.5 | M24X1.5 |
| SC32SPR19 | 19 | 32 | 72 | 44 | 17.5 | M24X1.5 |
| SC32SPR20 | 20 | 32 | 72 | 46 | 15.5 | M24X1.5 |
| SC32SPR24 | 24 | 32 | 72 | 45 | 10.5 | M24X1.5 |
| SC32SPR25 | 25 | 32 | 72 | 51 | 10.5 | M24X1.5 |

TUNGMAX

## SC-SEAL

Sealed collets for TungMax power chucks

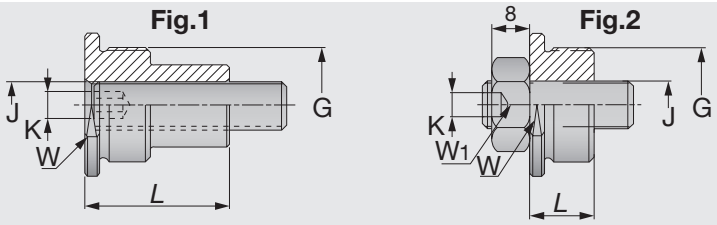



| Designation | ød2 | SS | L | L2 | L3 | G1 |
|---|---|---|---|---|---|---|
| SC20SEAL6 | 6 | 20 | 60 | 28 | 7 | M16 |
| SC20SEAL8 | 8 | 20 | 60 | 28 | 7 | M16 |
| SC20SEAL10 | 10 | 20 | 60 | 35 | 13 | M16 |
| SC20SEAL12 | 12 | 20 | 60 | 40 | 8 | M16 |
| SC20SEAL14 | 14 | 20 | 60 | 40 | 8 | M16 |
| SC20SEAL15 | 15 | 20 | 60 | 40 | 8 | M16 |
| SC20SEAL16 | 16 | 20 | 60 | 39 | 9 | M16 |
| SC32SEAL6 | 6 | 32 | 72 | 28 | 17 | M24X1.5 |
| SC32SEAL8 | 8 | 32 | 72 | 28 | 17 | M24X1.5 |
| SC32SEAL10 | 10 | 32 | 72 | 35 | 13 | M24X1.5 |
| SC32SEAL12 | 12 | 32 | 72 | 40 | 5 | M24X1.5 |
| SC32SEAL14 | 14 | 32 | 72 | 40 | 5 | M24X1.5 |
| SC32SEAL15 | 15 | 32 | 72 | 40 | 5 | M24X1.5 |
| SC32SEAL16 | 16 | 32 | 72 | 44 | 17.5 | M24X1.5 |
| SC32SEAL18 | 18 | 32 | 72 | 44 | 17.5 | M24X1.5 |
| SC32SEAL19 | 19 | 32 | 72 | 44 | 17.5 | M24X1.5 |
| SC32SEAL20 | 20 | 32 | 72 | 46 | 15.5 | M24X1.5 |
| SC32SEAL24 | 24 | 32 | 72 | 46 | 15.5 | M24X1.5 |
| SC32SEAL25 | 25 | 32 | 72 | 51 | 10.5 | M24X1.5 |

TUNGMAX

## PRESET SC-CAP

Preset screw housing for SC-SPR TungMax collets




| Designation | L | W | J | G | Fig | Range | key | CSI |
|---|---|---|---|---|---|---|---|---|
| PRESETSCCAP8x1.25L | 28 | 16 | M8X25 | M16 | 1 | 6-8 | 4 | SC20 |
| PRESETSCCAP8x1.25 | 15 | 16 | M8X25 | M16 | 2 | 10-16 | 4 | SC20 |
| PRESETSCCAP10x1.5L | 30 | 27 | M10X30 | M24X1.5 | 1 | 6-14 | 5 | SC32 |
| PRESETSCCAP10x1.5 | 13.5 | 27 | M10X30 | M24X1.5 | 2 | 16-25 | 5 | SC32 |

## TUNGHYDRO
### KIT BT-HYDRO

Hydraulic chuck kits with MAS-BT Form A/B Shanks



| Designation | SS | ød2 | Qty | Range |
|---|---|---|---|---|
| KITBT40HYDRO20X73 | 40 | 20 | 5 | 8,10,12,14,16 |
| KITBT40HYDRO32X110 | 40 | 32 | 7 | 6,8,10,12,16,20,25 |

• Each kit contains one HYDROFIT chuck, a set of SC...HYDRO sealed reducers and a clamping wrench.

## TUNGHYDRO
### KIT DIN69871-HYDRO

Contains a hydraulic chuck with a DIN69781 tapered shank and a set of collets in various bore sizes



| Designation | SS | ød2 | Qty | Range |
|---|---|---|---|---|
| KITDIN6987140HYDRO20X65 | 40 | 20 | 5 | 8,10,12,14,16 |
| KITDIN6987140HYDRO32X117 | 40 | 32 | 7 | 6,8,10,12,16,20,25 |

• Each kit contains one HYDROFIT chuck, a set of SC...HYDRO sealed reducers and a clamping wrench.

## TUNGHYDRO
### KIT HSK A-HYDRO

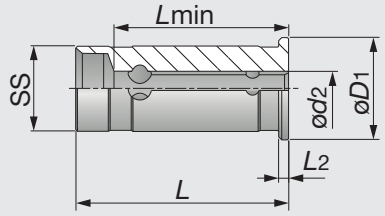
Contains a hydraulic chuck with HSK tapered shank and a set of collets in various bore sizes



| Designation | SS | ød2 | Qty | Range |
|---|---|---|---|---|
| KITHSKA63HYDRO20X100 | 63 | 20 | 5 | 8,10,12,14,16 |
| KITHSKA63HYDRO32X125 | 63 | 32 | 7 | 6,8,10,12,16,20,25 |

• Each kit contains one HYDROFIT chuck, a set of SC...HYDRO sealed reducers and a clamping wrench.

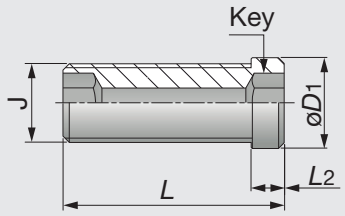
## Sealed reduction sleeves for hydraulic chucks




| Designation | SS | ød2 | Lmin | L | øD1 | L2 |
|---|---|---|---|---|---|---|
| SC12SHYDRO3 | 12 | 3 | 19 | 46.5 | 16 | 2 |
| SC12SHYDRO4 | 12 | 4 | 24 | 46.5 | 16 | 2 |
| SC12SHYDRO5 | 12 | 5 | 28 | 46.5 | 16 | 2 |
| SC12SHYDRO6 | 12 | 6 | 33 | 46.5 | 16 | 2 |
| SC12SHYDRO8 | 12 | 8 | 39 | 46.5 | 16 | 2 |
| SC20SHYDRO3 | 20 | 3 | 20 | 53 | 24 | 2 |
| SC20SHYDRO4 | 20 | 4 | 25 | 53 | 24 | 2 |
| SC20SHYDRO5 | 20 | 5 | 27 | 53 | 24 | 2 |
| SC20SHYDRO6 | 20 | 6 | 34 | 53 | 24 | 2 |
| SC20SHYDRO8 | 20 | 8 | 39 | 53 | 24 | 2 |
| SC20SHYDRO10 | 20 | 10 | 40 | 53 | 24 | 2 |
| SC20SHYDRO12 | 20 | 12 | 41 | 53 | 24 | 2 |
| SC20SHYDRO14 | 20 | 14 | 44 | 53 | 24 | 2 |
| SC20SHYDRO16 | 20 | 16 | 44 | 53 | 24 | 2 |
| SC25SHYDRO6 | 25 | 6 | 37 | 60 | 30 | 4 |
| SC25SHYDRO8 | 25 | 8 | 37 | 60 | 30 | 4 |
| SC25SHYDRO10 | 25 | 10 | 40 | 60 | 30 | 4 |
| SC25SHYDRO12 | 25 | 12 | 44 | 60 | 30 | 4 |
| SC25SHYDRO14 | 25 | 14 | 46 | 60 | 30 | 4 |
| SC25SHYDRO16 | 25 | 16 | 48 | 60 | 30 | 4 |
| SC25SHYDRO18 | 25 | 18 | 50 | 60 | 30 | 4 |
| SC25SHYDRO20 | 25 | 20 | 50 | 60 | 30 | 4 |
| SC32SHYDRO6 | 32 | 6 | 33 | 66 | 40 | 4 |
| SC32SHYDRO8 | 32 | 8 | 38 | 66 | 40 | 4 |
| SC32SHYDRO10 | 32 | 10 | 39 | 66 | 40 | 4 |
| SC32SHYDRO12 | 32 | 12 | 42 | 66 | 40 | 4 |
| SC32SHYDRO14 | 32 | 14 | 44 | 66 | 40 | 4 |
| SC32SHYDRO16 | 32 | 16 | 44 | 66 | 40 | 4 |
| SC32SHYDRO18 | 32 | 18 | 44 | 66 | 40 | 4 |
| SC32SHYDRO20 | 32 | 20 | 49 | 66 | 40 | 4 |
| SC32SHYDRO25 | 32 | 25 | 66 | 66 | 40 | 4 |

# TUNGHYDRO
## PRESET SCREW HYDRO

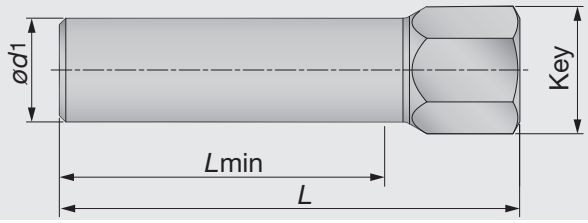
Tool stopper preset screws for the HYDRO collet chucks




| Designation | SS | øD1 | J | L | L2 | key |
|---|---|---|---|---|---|---|
| PRESETSCREWHYDROM5 | 6 | 5 | M5 | 14 | 1 | 2.5 |
| PRESETSCREWHYDROM6 | 8 | 6 | M6 | 14 | 1.5 | 3 |
| PRESETSCREWHYDROM8 | 10 | 8 | M8X1 | 14 | 2 | 4 |
| PRESETSCREWHYDROM10 | 12,14 | 10 | M10X1 | 17 | 2 | 5 |
| PRESETSCREWHYDROM16 | 20,25,32 | 14 | M16X1 | 20 | 2 | 8 |

# TUNGHYDRO
## TEST BAR HYDRO

Torque test bars for hydraulic chucks




| Designation | ød | L | key | Lmin(1) | Torque* |
|---|---|---|---|---|---|
| TESTBARHYDRO6 | 6 | 53 | 10 | 27 | 15 |
| TESTBARHYDRO8 | 8 | 53 | 10 | 27 | 25 |
| TESTBARHYDRO10 | 10 | 56 | 10 | 32 | 50 |
| TESTBARHYDRO12 | 12 | 62 | 10 | 37 | 110 |
| TESTBARHYDRO14 | 14 | 62 | 10 | 37 | 120 |
| TESTBARHYDRO16 | 16 | 71 | 17 | 37 | 180 |
| TESTBARHYDRO18 | 18 | 71 | 17 | 42 | 230 |
| TESTBARHYDRO20 | 20 | 71 | 17 | 42 | 250 |
| TESTBARHYDRO25 | 25 | 79 | 17 | 48 | 310 |
| TESTBARHYDRO32 | 32 | 87 | 17 | 52 | 450 |

*Torque: Recommended torque (Nm) for clamping. (1) Minimum holding length.

# TUNGMAX
## KIT SK-TUNGMAX

Contains a DIN 69871 holder with TUNGMAX power chuck and a set of collets with various bore sizes



| Designation | SS | ød2 | Qty | Range |
|---|---|---|---|---|
| KITSK40MAXIN20X956 | 40 | 20 | 6 | 6,8,10,12,14,16 |
| KITSK40MAXIN32X1067 | 40 | 32 | 7 | 6,8,10,12,16,20,25 |
| KITSK50MAXIN32X1007 | 50 | 32 | 7 | 6,8,10,12,16,20,25 |

• Each kit contains one power chuck, a set of SC-SPR collets, extraction hookand wrench.

## KIT HSK A-TUNGMAX

Contains a power chuck with an HSK taper shank and a set of collets in various bore sizes



| Designation | SS | ød2 | Qty | Range |
|---|---|---|---|---|
| KITHSKA100MAXIN20X1156 | 40 | 20 | 6 | 6,8,10,12,14,16 |
| KITHSKA63MAXIN20X956 | 50 | 20 | 6 | 6,8,10,12,14,16 |
| KITHSKA63MAXIN32X1137 | 50 | 32 | 7 | 6,8,10,12,16,20,25 |

• Each kit contains one power chuck, a set of SC-SPR collets, extraction hookand wrench.

## KIT BT-TUNGMAX

Contains a power chuck with a BT tapered shank and a set of collets in various bore sizes



| Designation | SS | ød2 | Qty | Range |
|---|---|---|---|---|
| KITBT40MAXIN20X856 | 40 | 20 | 6 | 6,8,10,12,14,16 |
| KITBT40MAXIN32X1087 | 40 | 32 | 7 | 6,8,10,12,16,20,25 |
| KITBT50MAXIN20X1056 | 50 | 20 | 6 | 6,8,10,12,14,16 |
| KITBT50MAXIN32X1067 | 50 | 32 | 7 | 6,8,10,12,16,20,25 |

• Each kit contains one power chuck, a set of SC-SPR collets, extraction hookand wrench.

## SET SC-SPR

Sets of SC straight collets for TUNGMAX power chucks



| Designation | SS | Qty | Range |
|---|---|---|---|
| SETSC20SPR6 | 20 | 6 | 6,8,10,12,14,16 |
| SETSC32SPR9 | 32 | 9 | 6,8,10,12,14,16,18,20,25 |

# TUNGMAX
## SET SC-SEAL

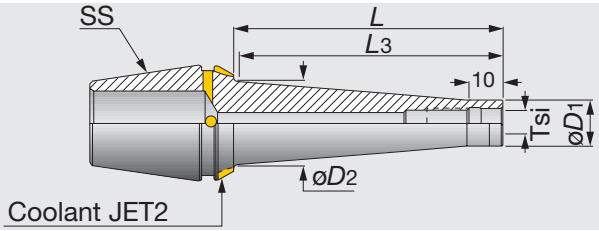
Sets of SC straight collets with coolant holes for TUNGMAX power chuck



| Designation | SS | Qty | Range |
|---|---|---|---|
| SETSC20SEAL6 | 20 | 6 | 6,8,10,12,14,16 |
| SETSC32SEAL9 | 32 | 9 | 6,8,10,12,14,16,18,20,25 |

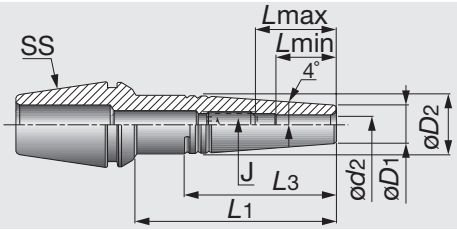
# TUNGFLEX
## ER-ODP

TungFlex threaded adaptation with integral ER collet for ER collet chucks




| Designation | Tsi | SS | øD1 | øD2 | L | L3 |
|---|---|---|---|---|---|---|
| ER32ODPM6X25 | M6 | ER32 | 9.8 | 14 | 25 | 22 |
| ER32ODPM6X50 | M6 | ER32 | 9.8 | 20 | 50 | 48 |
| ER32ODPM6X75 | M6 | ER32 | 9.8 | 23 | 75 | 74 |
| ER32ODPM8X25 | M8 | ER32 | 13.1 | 15 | 25 | 22 |
| ER32ODPM8X50 | M8 | ER32 | 13.1 | 23 | 50 | 49 |
| ER32ODPM8X75 | M8 | ER32 | 13.1 | 23 | 75 | 74 |
| ER32ODPM10X25 | M10 | ER32 | 18 | 20 | 25 | 23 |
| ER32ODPM10X50 | M10 | ER32 | 18 | 24 | 50 | 49 |
| ER32ODPM12X25 | M12 | ER32 | 21 | 24 | 25 | 24 |
| ER32ODPM12X50 | M12 | ER32 | 21 | 24 | 50 | 49 |

# TUNGSHRINK
## ER-SRK
TungShrink ER collet type



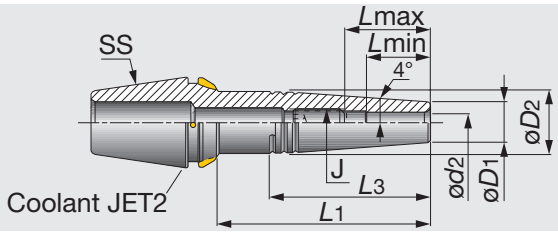

| Designation | SS | ød2 | øD1 | øD2 | L1 | L3 | Lmin | Lmax | J | key |
|---|---|---|---|---|---|---|---|---|---|---|
| ER11SRK3X10 (1) | ER11 | 3 | 7.6 | 8.5 | 10 | - | 9.5 | - | - | - |
| ER11SRK3X25 (1) | ER11 | 3 | 7.6 | 8.5 | 25 | - | 11.5 | - | - | - |
| ER11SRK4X10 (1) | ER11 | 4 | 7.6 | 8.5 | 10 | - | 9.5 | - | - | - |
| ER11SRK4X25 (1) | ER11 | 4 | 7.6 | 8.5 | 25 | - | 11.5 | - | - | - |
| ER20SRK3X35 | ER20 | 3 | 10 | 13.5 | 35 | 24 | 10 | 16 | M6 | 3 |
| ER20SRK3X60 | ER20 | 3 | 10 | 13.5 | 60 | 24 | 10 | 16 | M6 | 3 |
| ER20SRK4X35 | ER20 | 4 | 10 | 13.5 | 35 | 24 | 12 | 18 | M6 | 3 |
| ER20SRK4X60 | ER20 | 4 | 10 | 13.5 | 60 | 24 | 12 | 18 | M6 | 3 |
| ER20SRK5X35 | ER20 | 5 | 10 | 13.5 | 35 | 24 | 15 | 21 | M6 | 3 |
| ER20SRK5X60 | ER20 | 5 | 10 | 13.5 | 60 | 24 | 15 | 21 | M6 | 3 |
| ER20SRK6X35 | ER20 | 6 | 11 | 14.7 | 35 | 25 | 18 | 24 | M8 | 4 |
| ER20SRK6X60 | ER20 | 6 | 11 | 15.2 | 60 | 29 | 18 | 24 | M8 | 4 |
| ER25SRK3X35 | ER25 | 3 | 10 | 13.5 | 35 | 24 | 10 | 16 | M6 | 3 |
| ER25SRK3X60 | ER25 | 3 | 10 | 16.3 | 60 | 44 | 10 | 16 | M6 | 3 |
| ER25SRK4X35 | ER25 | 4 | 10 | 13.5 | 35 | 24 | 12 | 18 | M6 | 3 |
| ER25SRK4X60 | ER25 | 4 | 10 | 16.3 | 60 | 44 | 12 | 18 | M6 | 3 |
| ER25SRK5X35 | ER25 | 5 | 10 | 13.5 | 35 | 24 | 15 | 21 | M6 | 3 |
| ER25SRK5X60 | ER25 | 5 | 10 | 16.3 | 60 | 44 | 15 | 21 | M6 | 3 |
| ER25SRK6X35 | ER25 | 6 | 11 | 14.7 | 35 | 26 | 18 | 24 | M8 | 4 |
| ER25SRK6X60 | ER25 | 6 | 11 | 17.3 | 60 | 44 | 18 | 24 | M8 | 4 |
| ER25SRK8X35 | ER25 | 8 | 14 | 17.8 | 35 | 26 | 25 | 30 | M10 | 5 |
| ER25SRK8X60 | ER25 | 8 | 14 | 19.7 | 60 | 39 | 25 | 31 | M10 | 5 |
| ER32SRK3X35 | ER32 | 3 | 10 | 13.2 | 35 | 22 | 10 | 16 | M6 | 3 |
| ER32SRK3X60 | ER32 | 3 | 10 | 16.3 | 60 | 44 | 10 | 16 | M6 | 3 |
| ER32SRK3X85 | ER32 | 3 | 10 | 19.8 | 85 | 70 | 10 | 16 | M6 | 3 |
| ER32SRK4X35 | ER32 | 4 | 10 | 13.4 | 35 | 23 | 12 | 18 | M6 | 3 |
| ER32SRK4X60 | ER32 | 4 | 10 | 16.3 | 60 | 44 | 12 | 18 | M6 | 3 |
| ER32SRK4X85 | ER32 | 4 | 10 | 19.8 | 85 | 70 | 12 | 18 | M6 | 3 |
| ER32SRK5X35 | ER32 | 5 | 10 | 13.5 | 35 | 24 | 15 | 21 | M6 | 3 |
| ER32SRK5X60 | ER32 | 5 | 10 | 16.3 | 60 | 44 | 15 | 21 | M6 | 3 |
| ER32SRK5X85 | ER32 | 5 | 10 | 19.8 | 85 | 70 | 15 | 21 | M6 | 3 |
| ER32SRK6X35 | ER32 | 6 | 11 | 14.7 | 35 | 25 | 18 | 24 | M8 | 4 |
| ER32SRK6X60 | ER32 | 6 | 11 | 17.3 | 60 | 45 | 18 | 24 | M8 | 4 |
| ER32SRK6X85 | ER32 | 6 | 11 | 20.8 | 85 | 69 | 18 | 26 | M8 | 4 |
| ER32SRK8X35 | ER32 | 8 | 14 | 18.8 | 35 | 33 | 25 | 31 | M10 | 5 |
| ER32SRK8X60 | ER32 | 8 | 14 | 20.4 | 60 | 45 | 25 | 31 | M10 | 5 |
| ER32SRK8X85 | ER32 | 8 | 14 | 23.2 | 85 | 65 | 25 | 31 | M10 | 5 |
| ER32SRK10X35 | ER32 | 10 | 16 | 20.8 | 35 | 34 | 30 | 35 | M12 | 6 |
| ER32SRK10X60 | ER32 | 10 | 16 | 22.4 | 60 | 44 | 30 | 36 | M12 | 6 |
| ER32SRK10X85 | ER32 | 10 | 16 | 23 | 85 | 49 | 30 | 36 | M12 | 6 |
| ER32SRK12X35 | ER32 | 12 | 20 | 24 | 35 | 28 | 32 | - | - | - |
| ER32SRK12X60 | ER32 | 12 | 20 | 24 | 60 | 28 | 32 | 38 | M14 | 6 |
| ER32SRK12X85 | ER32 | 12 | 20 | 24 | 85 | 28 | 32 | 38 | M14 | 6 |

(1) To be used only for SpinJet spindles

# TUNGSHRINK

## ER-SRK JET2

TungShrink ER collet type with JET2 external coolant supply system

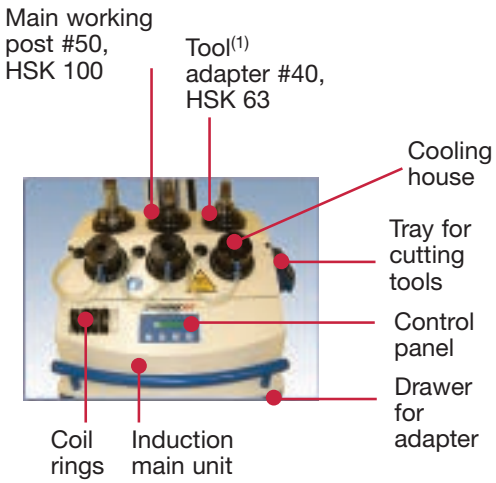



| Designation | SS | ød2 | øD1 | øD2 | L1 | L3 | Lmin | Lmax | J | key |
|---|---|---|---|---|---|---|---|---|---|---|
| ER20SRK3X35JET2 | ER20 | 3 | 10 | 13.5 | 35 | 24.5 | 10 | 16 | M6 | 3 |
| ER20SRK5X35JET2 | ER20 | 5 | 10 | 13.5 | 35 | 24.5 | 15 | 21 | M6 | 3 |
| ER20SRK6X35JET2 | ER20 | 6 | 11 | 14.7 | 35 | 25.5 | 18 | 24 | M8 | 4 |
| ER20SRK6X60JET2 | ER20 | 6 | 11 | 15.2 | 60 | 29.5 | 18 | 24 | M8 | 4 |
| ER25SRK3X35JET2 | ER25 | 3 | 10 | 13.5 | 35 | 24.5 | 10 | 16 | M6 | 3 |
| ER25SRK3X60JET2 | ER25 | 3 | 10 | 16.3 | 60 | 44.5 | 10 | 16 | M6 | 3 |
| ER25SRK4X35JET2 | ER25 | 4 | 10 | 13.5 | 35 | 24.5 | 12 | 18 | M6 | 3 |
| ER25SRK4X60JET2 | ER25 | 4 | 10 | 16.3 | 60 | 44.5 | 12 | 18 | M6 | 3 |
| ER25SRK5X35JET2 | ER25 | 5 | 10 | 13.5 | 35 | 24.5 | 15 | 21 | M6 | 3 |
| ER25SRK5X60JET2 | ER25 | 5 | 10 | 16.3 | 60 | 44.5 | 15 | 21 | M6 | 3 |
| ER25SRK6X35JET2 | ER25 | 6 | 11 | 14.7 | 35 | 26 | 18 | 24 | M8 | 4 |
| ER25SRK6X60JET2 | ER25 | 6 | 11 | 17.3 | 60 | 44.5 | 18 | 24 | M8 | 4 |
| ER25SRK8X35JET2 | ER25 | 8 | 14 | 17.8 | 35 | 26.5 | 25 | 30 | M10 | 5 |
| ER25SRK8X60JET2 | ER25 | 8 | 14 | 19.7 | 60 | 39.5 | 25 | 31 | M10 | 5 |
| ER32SRK3X35JET2 | ER32 | 3 | 10 | 13.2 | 35 | 22.5 | 10 | 16 | M6 | 3 |
| ER32SRK3X60JET2 | ER32 | 3 | 10 | 16.3 | 60 | 44.5 | 10 | 16 | M6 | 3 |
| ER32SRK3X85JET2 | ER32 | 3 | 10 | 19.8 | 85 | 70 | 10 | 16 | M6 | 3 |
| ER32SRK4X35JET2 | ER32 | 4 | 10 | 13.4 | 35 | 23.5 | 12 | 18 | M6 | 3 |
| ER32SRK4X60JET2 | ER32 | 4 | 10 | 16.3 | 60 | 44.5 | 12 | 18 | M6 | 3 |
| ER32SRK4X85JET2 | ER32 | 4 | 10 | 19.8 | 85 | 70 | 12 | 18 | M6 | 3 |
| ER32SRK5X35JET2 | ER32 | 5 | 10 | 13.5 | 35 | 24.5 | 15 | 21 | M6 | 3 |
| ER32SRK5X60JET2 | ER32 | 5 | 10 | 16.3 | 60 | 44.5 | 15 | 21 | M6 | 3 |
| ER32SRK5X85JET2 | ER32 | 5 | 10 | 19.8 | 85 | 70 | 15 | 21 | M6 | 3 |
| ER32SRK6X35JET2 | ER32 | 6 | 11 | 14.7 | 35 | 25.5 | 18 | 24 | M8 | 4 |
| ER32SRK6X60JET2 | ER32 | 6 | 11 | 17.3 | 60 | 45 | 18 | 24 | M8 | 4 |
| ER32SRK6X85JET2 | ER32 | 6 | 11 | 20.8 | 85 | 69.5 | 18 | 26 | M8 | 4 |
| ER32SRK8X35JET2 | ER32 | 8 | 14 | 18.8 | 35 | 33 | 25 | 31 | M10 | 5 |
| ER32SRK8X60JET2 | ER32 | 8 | 14 | 20.4 | 60 | 45 | 25 | 31 | M10 | 5 |
| ER32SRK8X85JET2 | ER32 | 8 | 14 | 23.2 | 85 | 65 | 25 | 31 | M10 | 5 |
| ER32SRK10X35JET2 | ER32 | 10 | 16 | 20.8 | 35 | 34 | 30 | 35 | M12 | 6 |
| ER32SRK10X60JET2 | ER32 | 10 | 16 | 22.4 | 60 | 44.5 | 30 | 36 | M12 | 6 |
| ER32SRK10X85JET2 | ER32 | 10 | 16 | 23 | 85 | 49.5 | 30 | 36 | M12 | 6 |
| ER32SRK12X35JET2 | ER32 | 12 | 20 | 24 | 35 | 28 | 32 | - | - | - |
| ER32SRK12X60JET2 | ER32 | 12 | 20 | 24 | 60 | 28 | 32 | 38 | M14 | 6 |
| ER32SRK12X85JET2 | ER32 | 12 | 20 | 24 | 85 | 28 | 32 | 38 | M14 | 6 |

# TUNGSHRINK
## IND SHRINKIN UNIT

SHRINKIN Induction heating unit for shrink tool chucking






| Designation | Machine |
|---|---|
| IND SHRINK IN UNIT EUR | 3-380-500V 50/60HZ |

# TUNGSHRINK
## IND SHRINK START UNIT

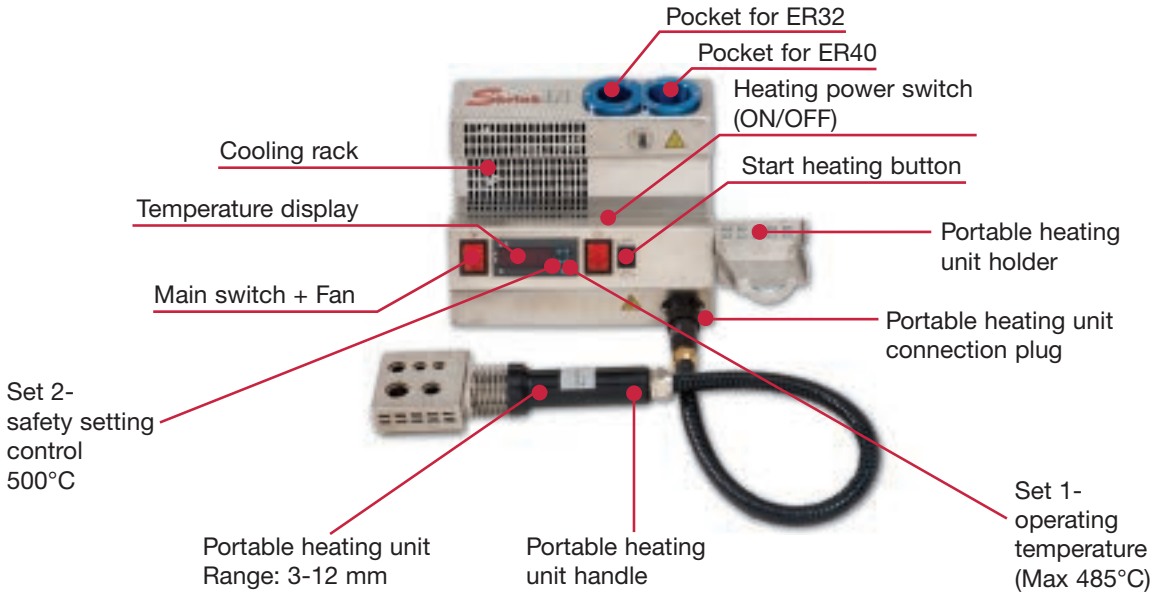
SHRINKIN Induction heating unit for shrink tool chucking



| Designation | Machine |
|---|---|
| IND SHRINK START UNIT EUR | 3-380-500V 50/60HZ |

# TUNGSHRINK
## SHRINKIN UNIT V2

SHRINKIN Thermal shrink heating unit for shrink tool chucking




| Designation | Machine |
|---|---|
| SHRINKIN UNIT V2 EUR | 220V 50/60HZ |

# TUNGSHRINK

## SET ER-SRK

A set of ER collets with thermal shrink chucks and various bore sizes



| Designation | SS | Qty | Range |
|---|---|---|---|
| SETER32SRKL6EUR | 32 | 6 | 4,5,6,8,10,12 |
| SETER32SRKM6EUR | 32 | 6 | 4,5,6,8,10,12 |
| SETER32SRKS6EUR | 32 | 6 | 4,5,6,8,10,12 |

## KIT SHRINKIN-V2 EUR

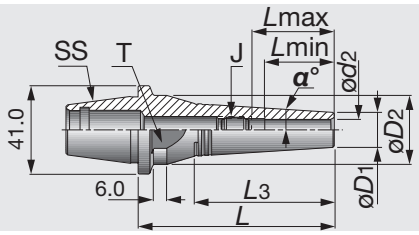
The KIT includes a thermal shrink heating unit and 6 ER32 SRK thermal collets



| Designation | SS | CSI | Qty | Range |
|---|---|---|---|---|
| KITSHRINKINMV2EUR | SHRINKIN UNIT V2 | SET ER32 SRK M | 6 | 4,5,6,8,10,12 |
| KITSHRINKINSV2EUR | SHRINKIN UNIT V2 | SET ER32 SRK S | 6 | 4,5,6,8,10,12 |

## TUNGCLICK
### ER-SRF

TungShrink quick change collet type

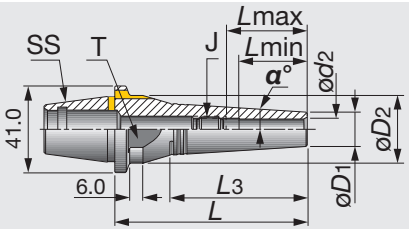



| Designation | SS | ød2 | øD1 | øD2 | L | L3 | J | key | α° | T | Lmin | Lmax |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ER32SRF3X50 | 32 SRF | 3 | 10 | 32 | 50 | 31 | M6 | 3 | 4 | 27 | 10 | 16 |
| ER32SRF3X85 | 32 SRF | 3 | 10 | 32 | 85 | 60.5 | M6 | 3 | 4 | 27 | 10 | 16 |
| ER32SRF4X50 | 32 SRF | 4 | 10 | 32 | 50 | 31 | M6 | 3 | 4 | 27 | 12 | 18 |
| ER32SRF4X85 | 32 SRF | 4 | 10 | 32 | 85 | 60.5 | M6 | 3 | 4 | 27 | 12 | 18 |
| ER32SRF5X50 | 32 SRF | 5 | 10 | 32 | 50 | 31 | M6 | 3 | 4 | 27 | 15 | 21 |
| ER32SRF5X85 | 32 SRF | 5 | 10 | 32 | 85 | 60.5 | M6 | 3 | 4 | 27 | 15 | 21 |
| ER32SRF6X50 | 32 SRF | 6 | 11 | 32 | 50 | 31 | M8 | 4 | 4 | 27 | 18 | 24 |
| ER32SRF6X85 | 32 SRF | 6 | 11 | 32 | 85 | 60.5 | M8 | 4 | 4 | 27 | 18 | 24 |
| ER32SRF8X50 | 32 SRF | 8 | 14 | 32 | 50 | 33 | M10 | 5 | 4 | 27 | 25 | 31 |
| ER32SRF8X85 | 32 SRF | 8 | 14 | 32 | 85 | 60.5 | M10 | 5 | 4 | 27 | 25 | 31 |
| ER32SRF10X50 | 32 SRF | 10 | 16 | 32 | 50 | 35 | M12 | 6 | 4 | 27 | 30 | 35 |
| ER32SRF10X85 | 32 SRF | 10 | 16 | 32 | 85 | 60.5 | M12 | 6 | 4 | 27 | 30 | 36 |
| ER32SRF12X50 | 32 SRF | 12 | 20 | 32 | 50 | 35 | M14 | 6 | 4 | 27 | 32 | 37 |
| ER32SRF12X85 | 32 SRF | 12 | 20 | 32 | 85 | 50 | M14 | 6 | 4 | 27 | 32 | 38 |

- Tightening torque: 235 N·m.

## TUNGCLICK
### ER-SRF JET2

TungClick quick change system with coolant supply and TungShrink thermal shrink holder

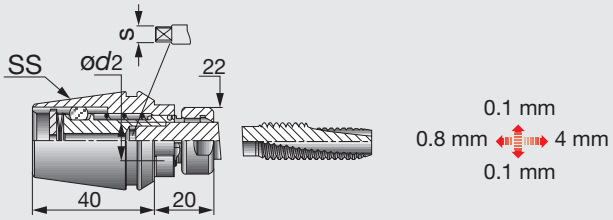



| Designation | SS | ød2 | øD1 | øD2 | L | L3 | J | key | α° | T | Lmin | Lmax |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ER32SRF3X50JET2 | 32 SRF | 3 | 10 | 32 | 50 | 31 | M6 | 3 | 4 | 27 | 10 | 16 |
| ER32SRF3X85JET2 | 32 SRF | 3 | 10 | 32 | 85 | 60 | M6 | 3 | 4 | 27 | 10 | 16 |
| ER32SRF4X50JET2 | 32 SRF | 4 | 10 | 32 | 50 | 31 | M6 | 3 | 4 | 27 | 12 | 18 |
| ER32SRF4X85JET2 | 32 SRF | 4 | 10 | 32 | 85 | 60 | M6 | 3 | 4 | 27 | 12 | 18 |
| ER32SRF5X85JET2 | 32 SRF | 5 | 10 | 32 | 85 | 60 | M6 | 3 | 4 | 27 | 15 | 21 |
| ER32SRF6X50JET2 | 32 SRF | 6 | 11 | 32 | 50 | 31 | M8 | 4 | 4 | 27 | 18 | 24 |
| ER32SRF6X85JET2 | 32 SRF | 6 | 11 | 32 | 85 | 60 | M8 | 4 | 4 | 27 | 18 | 24 |
| ER32SRF8X50JET2 | 32 SRF | 8 | 14 | 32 | 50 | 33 | M10 | 5 | 4 | 27 | 25 | 31 |
| ER32SRF8X85JET2 | 32 SRF | 8 | 14 | 32 | 85 | 60 | M10 | 5 | 4 | 27 | 25 | 31 |
| ER32SRF10X50JET2 | 32 SRF | 10 | 16 | 32 | 50 | 35 | M12 | 6 | 4 | 27 | 30 | 35 |
| ER32SRF10X85JET2 | 32 SRF | 10 | 16 | 32 | 85 | 60 | M12 | 6 | 4 | 27 | 30 | 36 |
| ER32SRF12X50JET2 | 32 SRF | 12 | 20 | 32 | 50 | 35 | M14 | 6 | 4 | 27 | 32 | 37 |
| ER32SRF12X85JET2 | 32 SRF | 12 | 20 | 32 | 85 | 50 | M14 | 6 | 4 | 27 | 32 | 38 |

- Tightening torque : 235 N·m.

## GTIN ER-ISO

ER collet tapping attachments, tension and compression ISO type used for CNC milling and turret lathe machines.

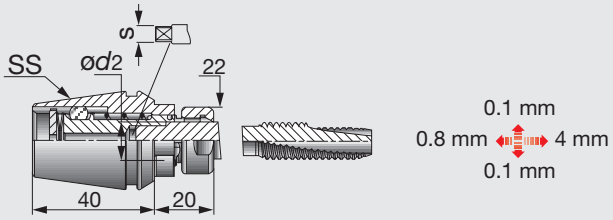



| Designation | SS | ød2 | S | Tap min | Tap max | T |
|---|---|---|---|---|---|---|
| GTINER32ISO2.24X1.80 | ER32 | 2.24 | 1.8 | M3 | M3 | 20 |
| GTINER32ISO2.50X2.00 | ER32 | 2.5 | 2 | M3.5 | M3.5 | 20 |
| GTINER32ISO2.80X2.24 | ER32 | 2.80 | 2.24 | M2.2 | M2.5 | 20 |
| GTINER32ISO3.15X2.50 | ER32 | 3.15 | 2.5 | M3 | M4 | 20 |
| GTINER32ISO3.55X2.80 | ER32 | 3.55 | 2.8 | M3.5 | M4.5 | 20 |
| GTINER32ISO4.00X3.15 | ER32 | 4 | 3.15 | M4 | M5 | 20 |
| GTINER32ISO4.50X3.55 | ER32 | 4.5 | 3.55 | M6 | M6 | 20 |
| GTINER32ISO5.00X4.00 | ER32 | 5 | 4 | M5 | M5 | 20 |
| GTINER32ISO5.60X4.50 | ER32 | 5.6 | 4.5 | UNC#12-24 | UNC#12-24 | 20 |
| GTINER32ISO6.30X5.00 | ER32 | 6.3 | 5 | M6 | M8 | 20 |
| GTINER32ISO7.10X5.60 | ER32 | 7.1 | 5.6 | UNC#-3/8-16 | UNC#-3/8-16 | 20 |
| GTINER32ISO8.00X6.30 | ER32 | 8 | 6.3 | M8 | M10 | 20 |
| GTINER32ISO9.00X7.10 | ER32 | 9 | 7.1 | M12 | M12 | 20 |
| GTINER32ISO10.00X8.00 | ER32 | 10 | 8 | M10 | M10 | 20 |
| GTINER32ISO11.20X9.00 | ER32 | 11.2 | 9 | M14 | M14 | 20 |
| GTINER32ISO12.50X10.00 | ER32 | 12.5 | 10 | M16 | M16 | 20 |

No coolant should be induced through the tapping collet, as it will cause malfunctioning of the mechanism.

## GTIN ER-DIN

ER collet tapping attachments, tension and compression DIN type used for CNC milling and turret lathe machines.

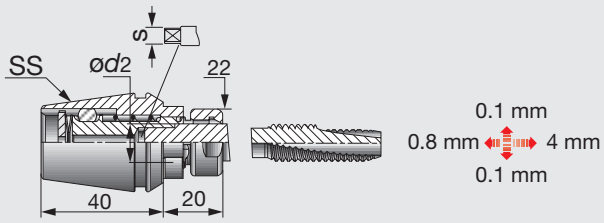



| Designation | SS | ød2 | S | Tap min | Tap max | T |
|---|---|---|---|---|---|---|
| GTINER32DIN2.50X2.10 | ER32 | 2.5 | 2.1 | M1 | M1.8 | 20 |
| GTINER32DIN2.80X2.10 | ER32 | 2.8 | 2.1 | M2 | M4 | 20 |
| GTINER32DIN3.50X2.70 | ER32 | 3.5 | 2.7 | M3 | M5 | 20 |
| GTINER32DIN4.00X3.00 | ER32 | 4 | 3 | M3 | M5 | 20 |
| GTINER32DIN4.50X3.40 | ER32 | 4.5 | 3.4 | M4 | M6 | 20 |
| GTINER32DIN6.00X4.90 | ER32 | 6 | 4.9 | M5 | M8 | 20 |
| GTINER32DIN7.00X5.50 | ER32 | 7 | 5.5 | M10 | M10 | 20 |
| GTINER32DIN8.00X6.20 | ER32 | 8 | 6.2 | M8 | M8 | 20 |
| GTINER32DIN9.00X7.00 | ER32 | 9 | 7 | M12 | M12 | 20 |
| GTINER32DIN10.00X8.00 | ER32 | 10 | 8 | M10 | M10 | 20 |
| GTINER32DIN11.00X9.00 | ER32 | 11 | 9 | M14 | M14 | 20 |
| GTINER32DIN12.00X9.00 | ER32 | 12 | 9 | M16 | M16 | 20 |

No coolant should be induced through the tapping collet, as it will cause malfunctioning of the mechanism.

## GTIN ER-JIS

ER collet tapping attachments, tension and compression JIS type used for CNC milling and turret lathe machines.




| Designation | SS | ød2 | S | Tap min | Tap max | T |
|---|---|---|---|---|---|---|
| GTINER32JIS3.00X2.50 | ER32 | 3 | 2.5 | M1 | M2.6 | 20 |
| GTINER32JIS4.00X3.20 | ER32 | 4 | 3.2 | M3 | M3.5 | 20 |
| GTINER32JIS5.00X4.00 | ER32 | 5 | 4 | M4 | M4 | 20 |
| GTINER32JIS6.00X4.50 | ER32 | 6 | 4.5 | M6 | M6 | 20 |
| GTINER32JIS6.20X5.00 | ER32 | 6.2 | 5 | M8 | M8 | 20 |
| GTINER32JIS7.00X5.50 | ER32 | 7 | 5.5 | M10 | M10 | 20 |
| GTINER32JIS8.50X6.50 | ER32 | 8.5 | 6.5 | M12 | M12 | 20 |
| GTINER32JIS10.50X8.00 | ER32 | 10.5 | 8 | M14 | M14 | 20 |
| GTINER32JIS12.50X10.00 | ER32 | 12.5 | 10 | M16 | M16 | 20 |

• No coolant should be induced through the tapping collet, as it will cause malfunctioning of the mechanism.

## DIN 69872 Pull Stud with JIS 63398 Retention Knob

**Fig.1**

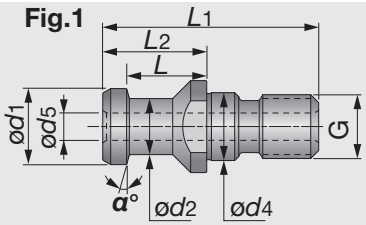



**Fig.2**

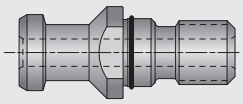
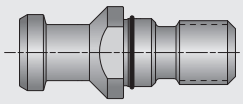


**Fig.3**



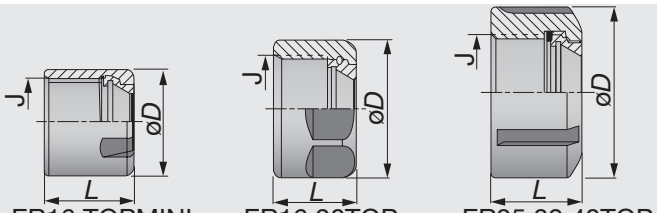
• Fig.1: Coolant holes only in items with a B suffix. • Fig.2: Without or with coolant holes and external O-ring.

| Designation | SS | G | ød1 | ød2 | ød4 | ød5 | L | L1 | L2 | α° | Fig |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PSSK3015M12DIN | 30 | M12 | 13 | 9 | 13 | - | 19 | 44 | 24 | 15 | 1 |
| PSSK4015M16DIN | 40 | M16 | 19 | 14 | 17 | - | 20 | 54 | 26 | 15 | 1 |
| PSSK4015M16DINO | 40 | M16 | 19 | 14 | 17 | - | 20 | 54 | 26 | 15 | 3 |
| PSSK4015M16DINB | 40 | M16 | 19 | 14 | 17 | 7 | 20 | 54 | 26 | 15 | 1 |
| PSSK4015M16DINOB | 40 | M16 | 19 | 14 | 17 | 7 | 20 | 54 | 26 | 15 | 2 |
| PSSK5015M24DIN | 50 | M24 | 28 | 21 | 25. | - | 25 | 74 | 34 | 15 | 1 |
| PSSK5015M24DINO | 50 | M24 | 28 | 21 | 25 | - | 25 | 74 | 34 | 15 | 3 |
| PSSK5015M24DINB | 50 | M24 | 28 | 21 | 25 | 11.5 | 25 | 74 | 34 | 15 | 1 |

TUNGHOLD

## NUT ER-TOP

DIN 6499 Nut for ER collet



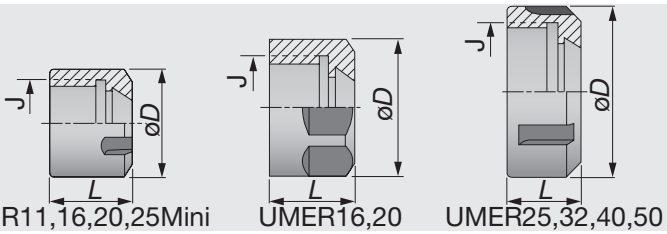

| Designation | øD | L | J | Torque* |
|---|---|---|---|---|
| NUTER16TOP | 28 | 17 | M22X1.5 | 68.7 |
| NUTER20TOP | 34 | 19 | M25X1.5 | 117.7 |
| NUTER25TOP | 42 | 20 | M32X1.5 | 196.1 |
| NUTER32TOP | 50 | 22 | M40X1.5 | 215.7 |
| NUTER40TOP | 63 | 25 | M50X1.5 | 245.1 |

*Torque: Recommended torque (Nm) for clamping

TUNGHOLD

## NUT ER-UM/MINI

Clamping Nuts for DIN 6499 ER Collet Chucks

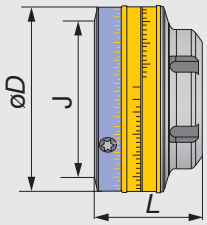



| Designation | øD | L | J | Torque* |
|---|---|---|---|---|
| NUTER11GHS (1) | 16 | 11.5 | M13X0.75 | - |
| NUTER11MINI | 16 | 10.8 | M13X0.75 | 29.4 |
| NUTER11UM | 19 | 11.3 | M14X0.75 | 49 |
| NUTER16MINI | 22 | 18 | M19X1.0 | 39.2 |
| NUTER16UM | 28 | 17 | M22X1.5 | 68.7 |
| NUTER20MINI | 28 | 19 | M24X1.0 | 78.5 |
| NUTER20UM | 34 | 19 | M25X1.5 | 117.7 |
| NUTER25MINI | 35 | 20 | M30X10 | 98 |
| NUTER25UM | 42 | 20 | M32X1.5 | 196.1 |
| NUTER32UM | 50 | 22 | M40X1.5 | 215.7 |
| NUTER40UM | 63 | 25 | M50X1.5 | 245.1 |
| NUTER50UM | 78 | 35 | M64X2.0 | 343.2 |

*Torque: Recommended torque (Nm) for clamping(1) To be used only for SpinJet spindles

# TUNGBALANCE
## NUT ER-BALANCE

BALANCIN Balanceable ER TOP DIN 6499 Nuts

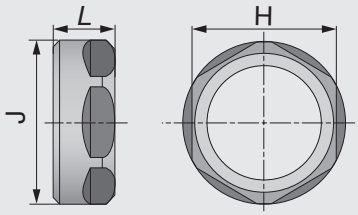



| Designation | øD | L | J | Torque* |
|---|---|---|---|---|
| NUTER16TOPBIN | 36 | 44 | M22X1.5 | 68.7 |
| NUTER25TOPBIN | 37.5 | 58 | M32X1.5 | 196.1 |
| NUTER32TOPBIN | 38 | 66 | M40X1.5 | 215.7 |

*Torque: Recommended torque (Nm) for clamping

# TUNGSHORT
## NUT ER-SHORT

Nuts for TungShort ER Collet Chucks



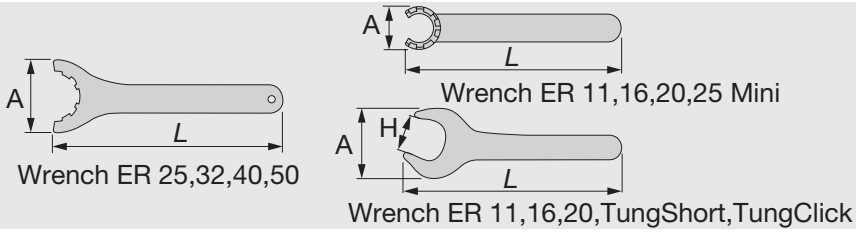

| Designation | H | L | J | Torque* |
|---|---|---|---|---|
| NUTER20SHORT | 22 | 10.7 | M25X1.5 | 117.7 |
| NUTER32SHORT | 36 | 15 | M40X1.5 | 215.7 |
| NUTER40SHORT | 46 | 16 | M50X1.5 | 245.1 |

*Torque: Recommended torque (Nm) for clamping

# TUNGHOLD

## WRENCH ER

Wrench for ER DIN 6499 Clamping Nut



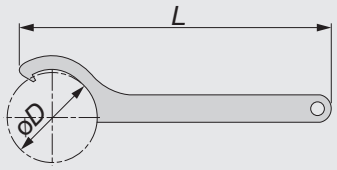

| Designation | A | H | L |
|---|---|---|---|
| WRENCHER11SMS (1) | 16 | - | 95 |
| WRENCHER11MINI | 16.8 | - | 95 |
| WRENCHER11 | 32 | 17 | 95 |
| WRENCHER16MINI | 22.5 | - | 117 |
| WRENCHER16 | 42.5 | 25 | 143 |
| WRENCHER20MINI | 28 | - | 128 |
| WRENCHER20 | 53.5 | 30 | 172 |
| WRENCHER25MINI | 29 | - | 120 |
| WRENCHER25 | 70 | - | 207 |
| WRENCHER32 | 78 | - | 255 |
| WRENCHER40 | 95 | - | 285 |
| WRENCHER50 | 110 | - | 350 |
| WRENCHER20SHORTRING22 | 48 | 22 | 260 |
| WRENCHER32SHORT | 75 | 36 | 303 |
| WRENCHER40SHORT | 94 | 46 | 378 |
| WRENCHER32CLICKIN27 | 57 | 27 | 239 |
| WRENCHER32CLICKIN32 | 67 | 32 | 273 |

(1) To be used only for SpinJet spindles

# TUNGMAX

## Wrench

Wrench for TungMax collets

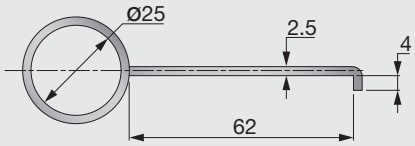



| Designation | øD | L |
|---|---|---|
| WRENCHMAXIN20HOOK | 26 | 205 |
| WRENCHMAXIN32HOOK | 68 | 240 |

TUNGHOLD

## SC

SC Collet Extraction Hook




| Designation | collet |
|---|---|
| EXTRACTOR SC COLLETS | SC straight collets |

TUNGHOLD

## PRESET ER-JET

Preset Screws with Oil Holes for ER Sealed Collets

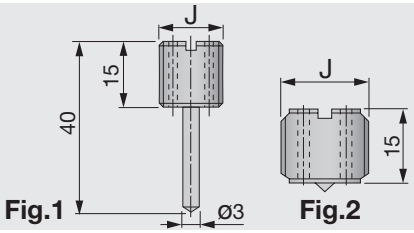
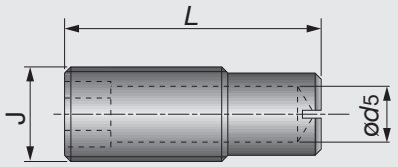



Fig.1 Fig.2

| Designation | J | Fig |
|---|---|---|
| PRESETER-JET8X1 | M8X1.0 | 2 |
| PRESETER-JET8X1.25 | M8X1.25 | 2 |
| PRESETER-JET10X1.5 | M10X1.5 | 2 |
| PRESETER-JET12X1 | M12X1.0 | 2 |
| PRESETER-JET12X1.75L | M12X1.75 | 1 |
| PRESETER-JET12X1.75 | M12X1.75 | 2 |
| PRESETER-JET14X1 | M14X1.0 | 2 |
| PRESETER-JET16X2 | M16X2 | 2 |
| PRESETER-JET16X2L | M16X2 | 1 |
| PRESETER-JET18X1 | M18X1.0 | 2 |
| PRESETER-JET18X1.5 | M18X1.5 | 2 |
| PRESETER-JET18X1.5L | M18X1.5 | 1 |
| PRESETER-JET22X1.5 | M22X1.5 | 2 |
| PRESETER-JET22X1.5L | M22X1.5 | 1 |
| PRESETER-JET28X1.5 | M28X1.5 | 2 |

## TUNGMAX
### Preset Screw

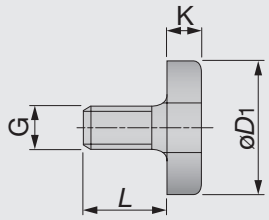
Preset Screw for TungMax chuck




| Designation | J | L | ød5 | key |
|---|---|---|---|---|
| PRESETMAXIN16X30 | M16 | 30 | 8 | 8 |
| PRESETMAXIN16X44 | M16 | 44 | 8 | 8 |
| PRESETMAXIN20X55 | M20 | 55 | 12 | 12 |

## TUNGHOLD
### SCREW-SEM

Lock Screw for Shell Mill Holder

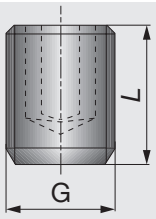



| Designation | G | øD1 | K | L |
|---|---|---|---|---|
| M8CLAMPSCREWSEM16 | M8 | 20 | 6 | 16 |
| M10CLAMPSCREWSEM22 | M10 | 28 | 7 | 18 |
| M12CLAMPSCREWSEM27 | M12 | 35 | 8 | 22 |
| M16CLAMPSCREWSEM32 | M16 | 42 | 9 | 26 |
| M20CLAMPSCREWSEM40 | M20 | 52 | 10 | 30 |
| M24CLAMPSCREWSEM50 | M24 | 63 | 12 | 36 |

TUNGHOLD

## SCREW-EM

Lock Screw for Endmill Holder

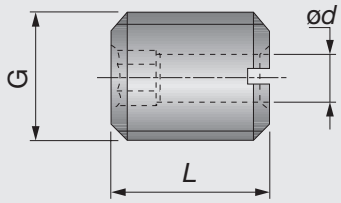



| Designation | G | L | For dia |
|---|---|---|---|
| SRM6X10DIN1835B | M6 | 10 | 6 |
| SRM8X10DIN1835-B | M8 | 10 | 8 |
| SRM10X12DIN1835-B | M10 | 12 | 10 |
| SRM12X16DIN1835-B | M12 | 16 | 12,14 |
| SRM14X16DIN1835-B | M14 | 16 | 14,16 |
| SRM16X16DIN1835-B | M16 | 16 | 20 |
| SRM18X2X20DIN1835-B | M18X2 | 20 | 25,32 |
| SRM20X2X20DIN1835-B | M20X2 | 20 | 40 |
| SRM24X2X25DIN1835-B | M24X2 | 25 | 50 |
| SRM16X10.3EMSHORT | M16 | 10.3 | 20 |
| SRM18X2X10EMSHORT | M18X2 | 10 | 2 |

TUNGHOLD

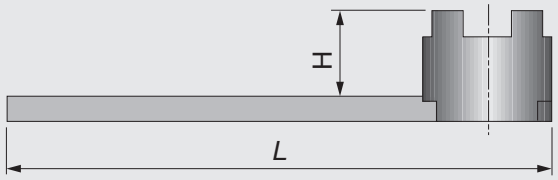
## PRESET SCREW

Preset Screw for EME/SRKIN Holder with coolant hole



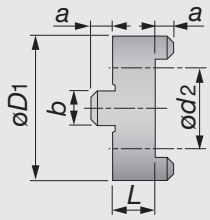

| Designation | G | L | ød | For Shanks | key |
|---|---|---|---|---|---|
| PRESETSCREWM6X20B | M6X1 | 20 | 2.5 | EME/SRKIN | 3 |
| PRESETSCREWM8X20B | M8X1.25 | 20 | 3.5 | EME/SRKIN | 4 |
| PRESETSCREWM10X18B | M10X1.5 | 18 | 4.5 | EME/SRKIN | 5 |
| PRESETSCREWM12X18B | M12X1.75 | 18 | 5.5 | EME/SRKIN | 6 |
| PRESETSCREWM16X20B | M16X2 | 20 | 7.5 | EME/SRKIN | 6 |
| PRESETSCREWM16X25B | M16X2 | 25 | 7.5 | SRKIN | 6 |

## TUNGHOLD
### WRENCH SEMC
Wrench DIN 6368 for Face and COMBI Shell Endmill Holders




| Designation | SMC | G | H | L |
|---|---|---|---|---|
| WRENCHM8SEMC16 | 16 | M8 | 20 | 180 |
| WRENCHM10SEMC22 | 22 | M10 | 25 | 200 |
| WRENCHM12SEMC27 | 25.4,27 | M12 | 32 | 225 |
| WRENCHM16SEMC32 | 31.75,32 | M16 | 36 | 250 |
| WRENCHM20SEMC40 | 38.1,40 | M20 | 40 | 280 |
| WRENCHM24SEMC50 | 50,50.8 | M24 | 50 | 315 |

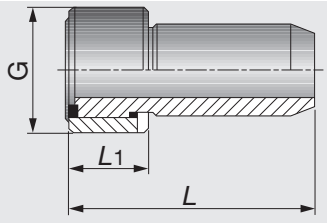
## TUNGHOLD
### DRIVING RING SEMC
Driving Ring DIN 6366/1 for COMBI Shell and Mill Holder




| Designation | ød2 | øD1 | L | a | b |
|---|---|---|---|---|---|
| 16D.RINGSEMC | 16 | 32 | 10 | 8 | 5 |
| 22D.RINGSEMC | 22 | 40 | 12 | 10 | 6 |
| 27D.RINGSEMC | 27 | 48 | 12 | 12 | 6.3 |
| 32D.RINGSEMC | 32 | 58 | 14 | 14 | 7 |
| 40D.RINGSEMC | 40 | 70 | 14 | 16 | 8 |
| 50D.RINGSEMC | 50 | 90 | 16 | 18 | 9 |

• Use's with "WRENCH SEMC"

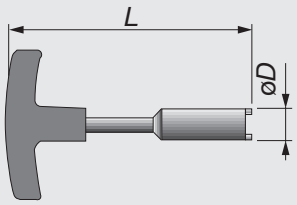
## TUNGHOLD
### COOLING TUBE-HSK
Cooling Tube for HSK




| Designation | SS | L | L1 | G |
|---|---|---|---|---|
| COOLINGTUBEHSKA40 | 40 | 29.1 | 7.5 | M12X1 |
| COOLINGTUBEHSKA50 | 50 | 32.7 | 9.5 | M16X1 |
| COOLINGTUBEHSKA63 | 63 | 36 | 11.5 | M18X1 |
| COOLINGTUBEHSKA80 | 80 | 36.6 | 13.5 | M20X1.5 |
| COOLINGTUBEHSKA100 | 100 | 43.6 | 15.5 | M24X1.5 |

## TUNGHOLD
### WRENCH

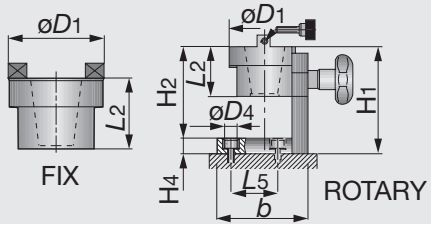
Wrench for HSK cooling tube




| Designation | SS | øD | L |
|---|---|---|---|
| WRENCHCOOLTUBEHSK40 | 40 | 11 | 120 |
| WRENCHCOOLTUBEHSK50 | 50 | 15 | 120 |
| WRENCHCOOLTUBEHSK63 | 63 | 17 | 122 |
| WRENCHCOOLTUBEHSK80 | 80 | 18.5 | 186 |
| WRENCHCOOLTUBEHSK100 | 100 | 22 | 141 |

## TUNGHOLD
### TOOL CLAMP

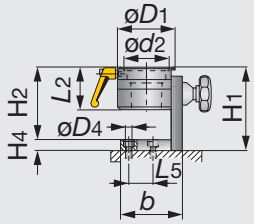
Tool clamp fixture for ISO, DIN 69871 and BT MAS-403 tool shanks




| Designation | CSI | øD1 | L2 | H1 | H2 | H4 | b | L5 | øD4 |
|---|---|---|---|---|---|---|---|---|---|
| TOOLCLAMP30ROTARY | ROTARY | 70 | 56 | 128 | 109 | 19 | 104 | 40 | 12.5 |
| TOOLCLAMP40ROTARY | ROTARY | 82 | 56 | 128 | 109 | 19 | 104 | 40 | 12.5 |
| TOOLCLAMP50ROTARY | ROTARY | 103 | 71 | 170 | 151 | 19 | 144 | 85 | 12.5 |
| TOOLCLAMP30FIX | FIX | 82 | 58 | - | - | - | - | - | - |
| TOOLCLAMP40FIX | FIX | 82 | 58 | - | - | - | - | - | - |
| TOOLCLAMP50FIX | FIX | 103 | 71 | - | - | - | - | - | - |

## TUNGHOLD
### MULTI CLAMP (HSK)

Multi-clamp rotary fixture for HSK shanks




| Designation | CSI | ød2 | øD1 | L2 | H1 | H2 | H4 | b | L5 | øD4 |
|---|---|---|---|---|---|---|---|---|---|---|
| MULTICLAMP32E/F | HSK A/C50 | 32 | 113.2 | 70 | 133 | 114 | 19 | 144 | 40 | 12.5 |
| MULTICLAMP40E/F | HSK A/C63 | 40 | 113.2 | 70 | 133 | 114 | 19 | 144 | 40 | 12.5 |
| MULTICLAMP50E/F | HSK A/C100 | 50 | 113.2 | 70 | 133 | 114 | 19 | 144 | 40 | 12.5 |
| MULTICLAMP63E/F | HSK E/F32 | 63 | 113.2 | 70 | 133 | 114 | 19 | 144 | 40 | 12.5 |
| MULTICLAMP50A/C | HSK E/F40 | 50 | 82 | 72 | 142 | 123 | 19 | 104 | 40 | 12.5 |
| MULTICLAMP63A/C | HSK E/F50 | 63 | 95 | 72 | 142 | 123 | 19 | 104 | 40 | 12.5 |
| MULTICLAMP100A/C | HSK E/F63 | 100 | 130 | 90 | 178 | 159 | 19 | 144 | 85 | 12.5 |

# EASYLOCK

## EASY LOCK

Electrical Nut-Clamp Torque Control Device



Choose the correct wrench size. Mount it on the wrench holder.

Place the wrench on the collet chuck nut.

Mount the collet chuck into the unit spindle.

Ensure that main power switch is on and that the power supply cable is connected.

**To clamp** - Push and hold in the “clamp” button until the bottom light goes off.

Torque selector **NEW**

Power lamp

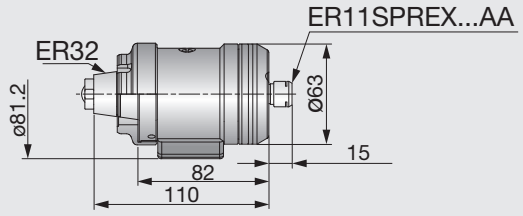
**To unclamp** - Push and hold in the “unclamp” button until the collet chuck is totally open.

**Note:** Assemble the collet and cutting tool. By hand, place the nut onto the collet chuck.

| Designation | Machine |
|---|---|
| EASYLOCKT.CEU | 200/240V 50/60 HZ |

# TJS-ER32

## Coolant driven high speed compact spindles for ER32 collet chuck




| Description | Designation |
|---|---|
| Display* | TJSTSDDISPLAY |
| Nut | NUTER11GHS |
| Wrench for nut | WRENCHER11SMS |
| Wrench for setting | WRENCHDIA3.2X45 |

*Option

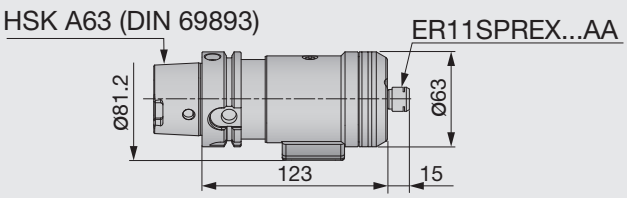
| Designation | Max. tool diameter ø*Dc* | Weight (kg) | Direction of tool rotation |
|---|---|---|---|
| TJS20KER32L | 3.5 | 1.1 | L |
| TJS20KER32R | 3.5 | 1.1 | R |
| TJS30KER32L | 2.5 | 1.1 | L |
| TJS30KER32R | 2.5 | 1.1 | R |
| TJS40KER32L | 1.5 | 1.1 | L |
| TJS40KER32R | 1.5 | 1.1 | R |

- Max. tool shank diameter: ø6.0 mm
- Coolant pressure through machine spindle: Min. 2 MPa / Max. 4 MPa
- Min. flow rate: 12 l/min

SPINJET

## TJS-HSK A63

Coolant driven high speed compact spindles with HSK A63 shanks




| Description | Designation |
|---|---|
| Display* | TJSTSDDISPLAY |
| Nut | NUTER11GHS |
| Wrench for nut | WRENCHER11SMS |
| Wrench for setting | WRENCHDIA3.2X45 |

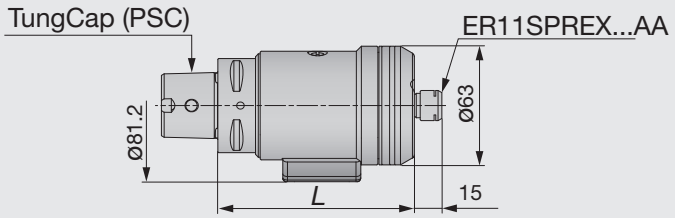
*Option

| Designation | Max. tool diameter ø$D_C$ | Weight (kg) | Direction of tool rotation |
|---|---|---|---|
| TJS20KHSKA63L | 3.5 | 1.6 | L |
| TJS20KHSKA63R | 3.5 | 1.6 | R |
| TJS30KHSKA63L | 2.5 | 1.6 | L |
| TJS30KHSKA63R | 2.5 | 1.6 | R |
| TJS40KHSKA63L | 1.5 | 1.6 | L |
| TJS40KHSKA63R | 1.5 | 1.6 | R |

- Max. tool shank diameter: ø6.0 mm
- Coolant pressure through machine spindle: Min. 2 MPa / Max. 4 MPa
- Min. flow rate: 12 l/min

## TJS-C

Coolant driven high speed compact spindles with TungCap PSC ISO 26623-1 shanks




| Description | Designation |
|---|---|
| Display* | TJSTSDDISPLAY |
| Nut | NUTER11GHS |
| Wrench for nut | WRENCHER11SMS |
| Wrench for setting | WRENCHDIA3.2X45 |

*Option

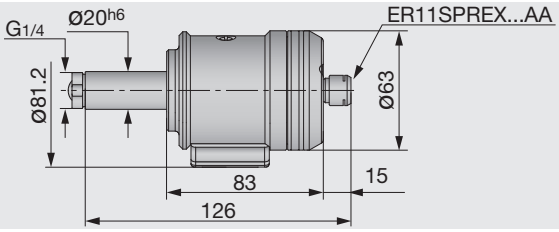
| Designation | SS | *L* | Max. tool diameter ø$D_C$ | Weight (kg) | Direction of tool rotation |
|---|---|---|---|---|---|
| TJS20KC5L | C5 | 104 | 3.5 | 1.5 | L |
| TJS20KC5R | C5 | 104 | 3.5 | 1.5 | R |
| TJS30KC5L | C5 | 104 | 2.5 | 1.5 | L |
| TJS30KC5R | C5 | 104 | 2.5 | 1.5 | R |
| TJS40KC5L | C5 | 104 | 1.5 | 1.5 | L |
| TJS40KC5R | C5 | 104 | 1.5 | 1.5 | R |
| TJS20KC6L | C6 | 106 | 3.5 | 1.65 | L |
| TJS20KC6R | C6 | 106 | 3.5 | 1.65 | R |
| TJS30KC6L | C6 | 106 | 2.5 | 1.65 | L |
| TJS30KC6R | C6 | 106 | 2.5 | 1.65 | R |
| TJS40KC6L | C6 | 106 | 1.5 | 1.65 | L |
| TJS40KC6R | C6 | 106 | 1.5 | 1.65 | R |

- Max. tool shank diameter: ø6 mm
- Coolant pressure through machine spindle: Min. 2 MPa / Max. 4 MPa
- Min. flow rate: 12 l/min

SPINJET

## TJS-ST

Coolant driven high speed compact spindles with straight (Cyrindrical) shanks




| Descriptions | Designation |
|---|---|
| Display* | TJSTSDDISPLAY |
| Nut | NUTER11GHS |
| Wrench for nut | WRENCHER11SMS |
| Wrench for setting | WRENCHDIA3.2X45 |

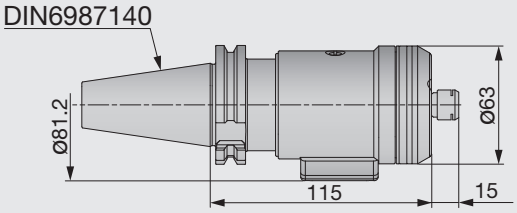
*Option

| Designation | Max. tool diameter ø*Dc* | Weight (kg) | Direction of tool rotation |
|---|---|---|---|
| TJS20KST20L | 3.5 | 1.1 | L |
| TJS20KST20R | 3.5 | 1.1 | R |
| TJS30KST20L | 2.5 | 1.1 | L |
| TJS30KST20R | 2.5 | 1.1 | R |
| TJS40KST20L | 1.5 | 1.1 | L |
| TJS40KST20R | 1.5 | 1.1 | R |

- Max. tool shank diameter: ø6 mm
- Coolant pressure through machine spindle: Min. 2 MPa / Max. 4 MPa
- Min. flow rate: 12 l/min

## TJS-DIN69871

Coolant driven high speed compact spindles with DIN69871 shanks




| Description | Designation |
|---|---|
| Display* | TJSTSDDISPLAY |
| Nut | NUTER11GHS |
| Wrench for nut | WRENCHER11SMS |
| Wrench for setting | WRENCHDIA3.2X45 |

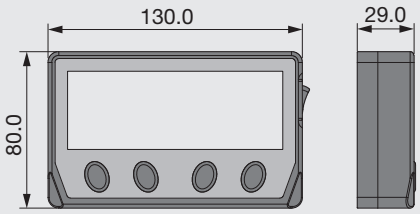
*Option

| Designation | Max. tool diameter ø*Dc* | Weight (kg) | Direction of tool rotation |
|---|---|---|---|
| TJS20KDIN6987140L | ø3.5 | 1.6 | L |
| TJS20KDIN6987140R | ø3.5 | 1.6 | R |
| TJS30KDIN6987140L | ø2.5 | 1.6 | L |
| TJS30KDIN6987140R | ø2.5 | 1.6 | R |
| TJS40KDIN6987140L | ø1.5 | 1.6 | L |
| TJS40KDIN6987140R | ø1.5 | 1.6 | R |

- Max. tool shank diameter: ø6 mm
- Coolant pressure through machine spindle: Min. 2 MPa / Max. 4 MPa
- Min. flow rate: 12 l/min

## SPINJET
### Wireless RPM speed display

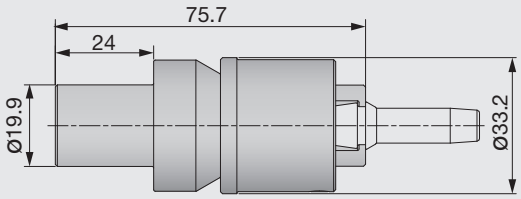
RPM speed display for SPINJET high speed spindles




| Designation | Machine |
|---|---|
| TJSTSDDISPLAY | TJS spindles |

## ER-SRK Shrink collet adapter

ER 11 shrink collet adapter for induction heating device

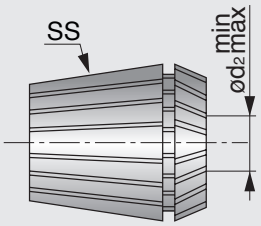


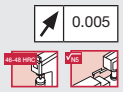

| Designation | Machine |
|---|---|
| INDER11TOOLADAPTER | TJS spindles |

## ER-SPR-AA

ER 11 AA collet





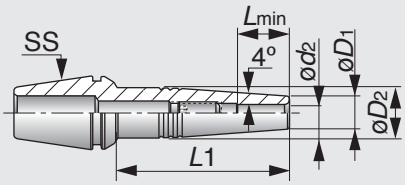




| Designation | SS | ød2 min | ød2 max |
|---|---|---|---|
| ER11SPR0.5-1AA | ER11 | 0.5 | 1 |
| ER11SPR1-2AA | ER11 | 1 | 2 |
| ER11SPR2-3AA | ER11 | 2 | 3 |
| ER11SPR3-4AA | ER11 | 3 | 4 |
| ER11SPR4-5AA | ER11 | 4 | 5 |
| ER11SPR5-6AA | ER11 | 5 | 6 |
| ER11SPR6-7AA | ER11 | 6 | 7 |

AA collet run-out: 0.005 mm

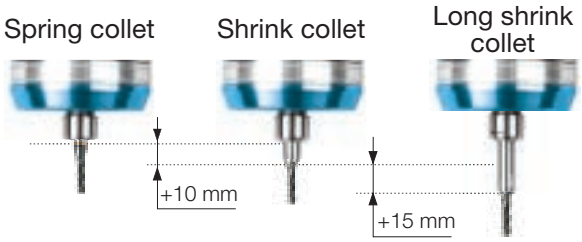
## ER-SRK Shrink collet

ER 11 shrink collet for induction heating device

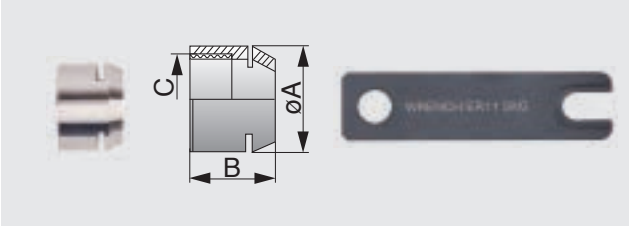



| Designation | SS | ød2 | L1 | Lmin | øD2 | øD1 |
|---|---|---|---|---|---|---|
| ER11SRK3X10 | ER11 | 3 | 10 | 9.5 | 8.5 | 7.6 |
| ER11SRK3X25 | ER11 | 3 | 25 | 11.5 | 8.5 | 7.6 |
| ER11SRK4X10 | ER11 | 4 | 10 | 9.5 | 8.5 | 7.6 |
| ER11SRK4X25 | ER11 | 4 | 25 | 11.5 | 8.5 | 7.6 |

• For carbide tools only

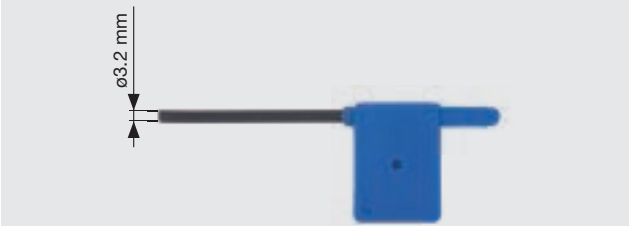



## Nut and wrench for collets




| Designation | øA | B | C | Wrench |
|---|---|---|---|---|
| NUTER11GHS | 16 | 11.5 | M13X0.75 | WRENCHER11SMS |

## Wrench for setting




| Designation |
|---|
| WRENCHDIA3.2x45 |

| Ring colour | Blue | Red | Yellow |
|---|---|---|---|
| Shape |  |  |  |
| No. of revolutions: n (RPM) | 40,000 | 30,000 | 20,000 |
| Designation | TJS40K... | TJS30K | TJS20K |
| Coolant pressure: (MPa) | 2 | 2 | 2 |
| Min. flow rate: (l/min) | 12 | 12 | 12 |
| Max. shank dia: øDs (mm) | 6 | 6 | 6 |
| Tool dia: øDc (mm) | 0.2 - 1.5 | 1.6 - 2.5 | 2.6 - 3.5 |

## Speed vs. pressure

| Jet spindle type / n (RPM) | Coolant pressure | | |
|---|---|---|---|
| | 2 MPa | 3 MPa | 4 MPa |
| TJS20K-ER32 | 20000 | 30000 | 40000 |
| TJS30K-ER32 | 30000 | 40000 | 50000 |
| TJS40K-ER32 | 40000 | 50000 | 60000 |

These are approximate RPM values, and they depend on coolant pressure, flow rate, and type.

MEMO

# Complete Tightening & Rigid Clamping



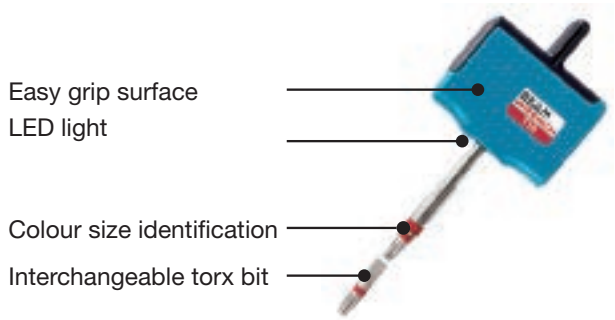
## Features

### LED illuminates at correct torque!

- When reaching the required clamping force, the LED will be activated.
- Enables the operator to set the insert correctly.
- Provides stable and correct clamping forces in any position.

### Available various kinds of torque size!

- 5 Torx sizes are available.
- Hardened steel enhances the life of bit.




## How to exchange a bit.

**Unlock the used bit**

- Pull the sleeve to loosen the bit



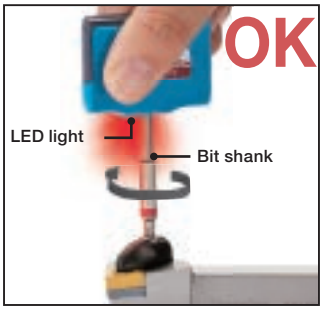
**Lock the new bit**

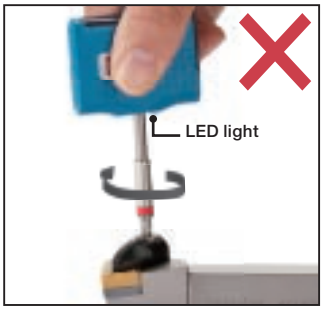
- After placing the bit in the correct position, push the sleeve to lock the bit.



## Attention when tightening:

- Hold the grip in a position, so the LED can be seen on the left side of bit shank. (See the picture below) Tighten the screw clockwise.




## BEAMWRENCH set

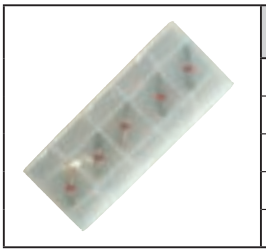


| Shape | Designation | Torx Size | Torque (N·m) | Colour |
|---|---|---|---|---|
| Single flag | **BW-SF6** | T 6 | 0.6 | White |
| | **BW-SF7** | T 7 | 0.9 | Black |
| | **BW-SF8** | T 8 | 1.2 | Green |
| | **BW-SF9** | T 9 | 1.4 | Blue |



| Shape | Designation | Torx Size | Torque (N·m) | Colour |
|---|---|---|---|---|
| Double flag | **BW-DF8** | T 8 | 1.2 | Green |
| | **BW-DF9** | T 9 | 1.4 | Blue |
| | **BW-DF15** | T 15 | 3.0 | Red |

## BEAMWRENCH torx bits set



| Bit Designation | Torx Size | Torque (N·m) | Colour |
|---|---|---|---|
| **BW-TX6SET5** | T 6 | 0.6 | White |
| **BW-TX7SET5** | T 7 | 0.9 | Black |
| **BW-TX8SET5** | T 8 | 1.2 | Green |
| **BW-TX9SET5** | T 9 | 1.4 | Blue |
| **BW-TX15SET5** | T 15 | 3.0 | Red |

Purchase the Torx bit set with same colour of your BeamWrench using. Torx bits set: Packing Quantity = 5 pcs.

MEMO

# PINZBOHR® Boring System

## Features

### ● Highly economical modular tool system

Tools are functionally classified and combined with arbor heads available in a wide variety of shapes and sizes to make up various boring tools. When used in diversified machining processes, this will help reduce the tooling costs considerably.



### ● Applicable to a wide range of bore diameters from minimum ø5.5 to maximum ø500 mm

The head, for small diameter finish and applicable down to ø5.5 mm. The heads for roughing and finishing can cope with wide-ranging diameters from ø24 ~ ø500 mm when the head is changed and combined with fine adjustment function.

### ● High rigidity and accuracy

The head and arbor are connected firmly with two tapered threads and drive key, ensuring high rigidity and superior repetition accuracy.

### ● One action adjustment

The heads for rough boring can be adjusted in terms of two edge dimensions quickly in one action. The adjusting screw is protected with the damage prevention function.

### ● Abundant insert variation

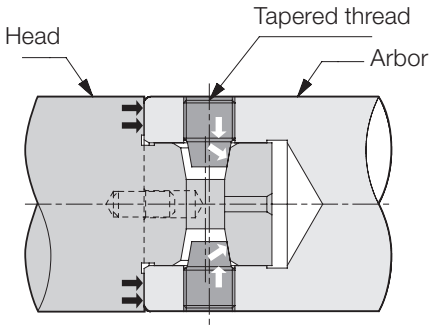
The inserts used are standard products complying with ISO. Insert grades and chipbreakers applied to various work materials and machining conditions are available in a wide range of shapes and sizes.

### ● Variety of cartridges

The rough boring heads of ø80 mm or more in diameter are available with various inserts and step machining cartridges.

## Part assembly

### Coupling System




Strong rigid connection between Boring Head and Arbor.

### Adjusting of Finishing Heads



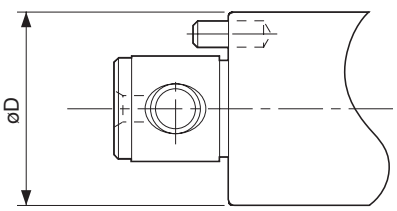
Adjusting Accuracy ø0.002 mm

### Connection diameter

Arbor Designation

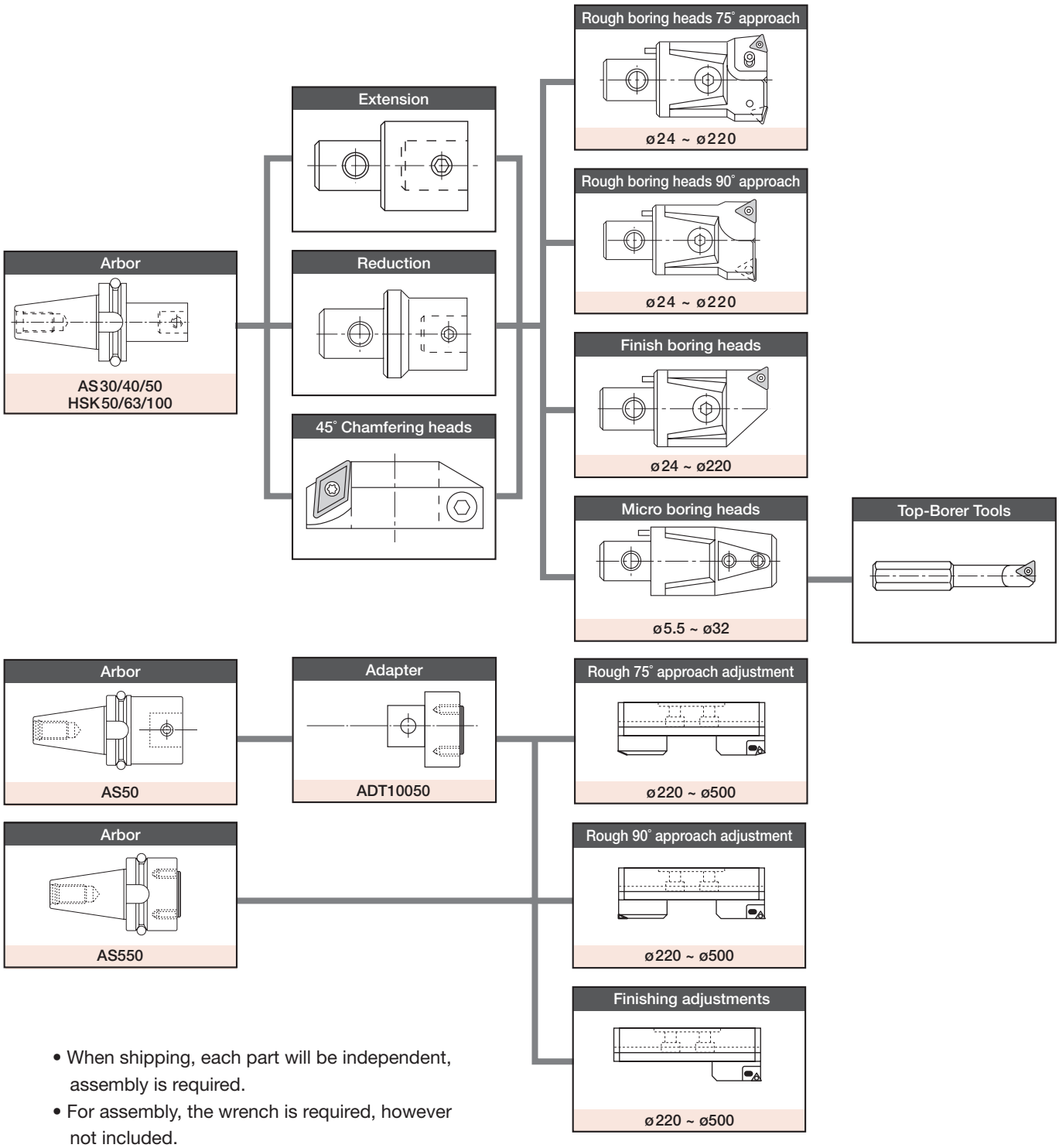
Ex) BT35042160

└ øD




PINZBOHR® Boring System is a tie-up product with MYFHE, S. A.

# System




- When shipping, each part will be independent, assembly is required.
- For assembly, the wrench is required, however not included.
- Pull-stud bolt is not included.
- The insert is not included and should be purchased separately.

PINZBOHR® Boring System is a tie-up product with MYFHE, S. A.

# Designation System for PINZBOHR®

## Boring Heads

| | |
|---|---|
| A | Finish boring heads |
| D | Rough boring heads |

① For use

75° / 90°
③ Approach angle

2CT / 3CT
④ Cartridge Size
(When cartridge required)

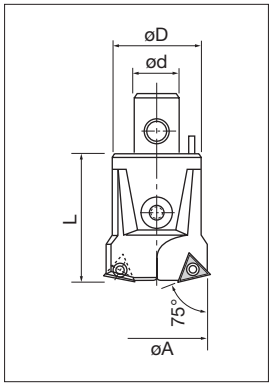
Example ① **A** ② **85** ③ **90** ④ **3CT** ⑤ **300**

② Head Size (øD)

| øD | Dia. øA | øD | Dia. øA |
|---|---|---|---|
| 22 | ø24 ~ 30 | 85 | ø100 ~ 125 |
| 27 | ø29 ~ 40 | 100 | ø125 ~ 160 |
| 32 | ø39 ~ 50 | 200 | ø160 ~ 220 |
| 42 | ø49 ~ 65 | 300 | ø220 ~ 320 |
| 54 | ø63 ~ 82 | 400 | ø290 ~ 400 |
| 68 | ø80 ~ 102 | 500 | ø370 ~ 500 |

⑤ Insert Size

| | |
|---|---|
| 300 | TC□□16T3□□ |
| 400 | CC□□0602□□ |
| 402N | CN□□1204□□ |
| 409 | CC□□09T3□□ |



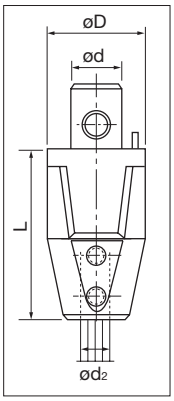

## Micro Boring Heads

Example ① **A** ② **32** ③ **010**

| ① For use | |
|---|---|
| A | Finish boring heads |

② Head Size: øD

③ Diameter of setting Boring Bars: ød2




## Arbors

Example ① **AS** ② **340** ③ **22** ④ **50**

① Shank type: AS ( MAS AS 403 )

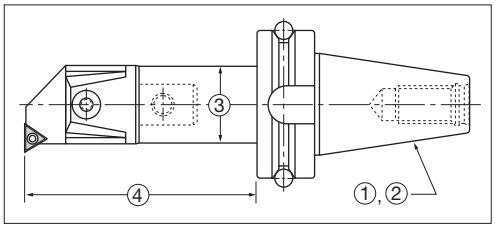
② Taper size

| | |
|---|---|
| 340 | AS40 |
| 350 | AS50 |
| 550 | AS50 (For large boring head) |

③ Shank: øD

④ Effective boring depth

| | |
|---|---|
| 50 | 130 |
| 55 | 160 |
| 60 | 200 |
| 75 | 260 |
| 80 | 320 |
| 100 | – |



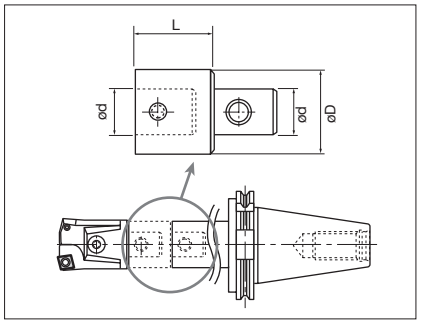

## Extensions

Example ① **P** ② **22** ③ **20**

① Extension

② Shank ø: øD

③ Extension length: L




## Reductions

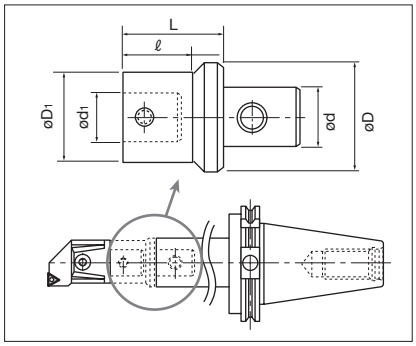
Example ① **R** ② **27** ③ **22** ④ **36**

① Reduction

② Shank ø: Connection øD

② Shank ø: Reduction øD1

④ Reduction length: L

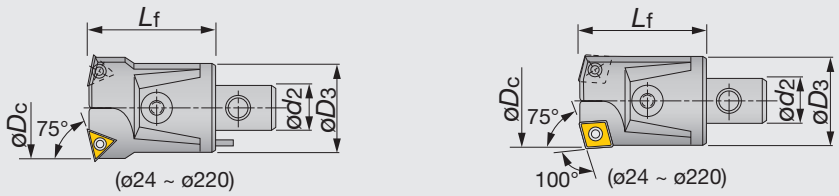



PINZBOHR® Boring System is a tie-up product with MYFHE, S. A.

Tooling System

## D##75

Roughing-Head with 75° approach for dia 24 - 82mm

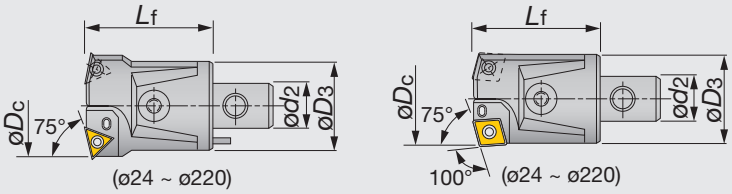



| Designation | øDc min | øDc max | øD3 | ød2 | Lf | Weight (kg) | Insert |
|---|---|---|---|---|---|---|---|
| D2275400 | 24 | 30 | 22 | 12 | 34 | 0.1 | CC**0602... |
| D2775409 | 29 | 40 | 27 | 15 | 42 | 0.18 | CC**09T3... |
| D3275409 | 39 | 50 | 32 | 20 | 45 | 0.26 | CC**09T3... |
| D4275300 | 49 | 65 | 42 | 24 | 56 | 0.6 | TC**16T3... |
| D4275402N | 53 | 65 | 42 | 24 | 56 | 0.6 | CN**1204... |
| D5475300 | 63 | 82 | 54 | 28 | 66 | 1.1 | TC**16T3... |
| D5475402N | 63 | 82 | 54 | 28 | 66 | 1.1 | CN**1204... |

• 100° corner of CC**0602, CC**09T3 and CN**1204 are used.

## D##75_CT

Roughing-Head with 75° approach for dia 80 - 220mm, with cartridge

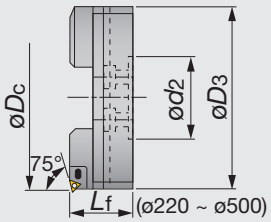



| Designation | øDc min | øDc max | øD3 | ød2 | Lf | Weight (kg) | Insert |
|---|---|---|---|---|---|---|---|
| D68752CT300 | 80 | 102 | 68 | 36 | 86 | 2.3 | TC**16T3... |
| D68752CT402N | 80 | 102 | 68 | 36 | 86 | 2.3 | CN**1204... |
| D85753CT300 | 100 | 125 | 85 | 50 | 100 | 4.3 | TC**16T3... |
| D85753CT402N | 100 | 125 | 85 | 50 | 100 | 4.3 | CN**1204... |
| D100753CT300 | 125 | 160 | 110 | 60 | 100 | 6.8 | TC**16T3... |
| D100753CT402N | 125 | 160 | 110 | 60 | 100 | 6.8 | CN**1204... |
| D200753CT300 | 160 | 220 | 145 | 60 | 100 | 9 | TC**16T3... |
| D200753CT402N | 160 | 220 | 145 | 60 | 100 | 9 | CN**1204... |

• 100° corner of CN**1204 is used.

## D##75_CT-Large

Roughing-Head with 75° approach for dia 220 - 320mm, with cartridge



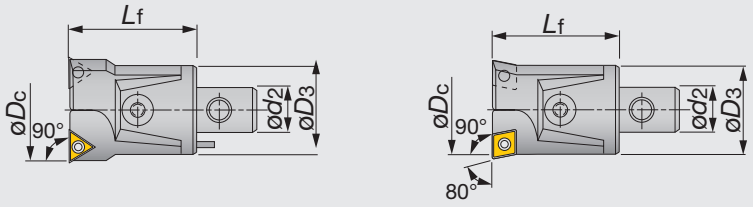

| Designation | øDc min | øDc max | øD3 | ød2 | Lf | Weight (kg) | Insert |
|---|---|---|---|---|---|---|---|
| D300753CT300 | 220 | 320 | 202 | 60 | 90 | 10.1 | TC**16T3... |
| D300753CT402N | 220 | 320 | 202 | 60 | 90 | 10.1 | CN**1204... |



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## D##90

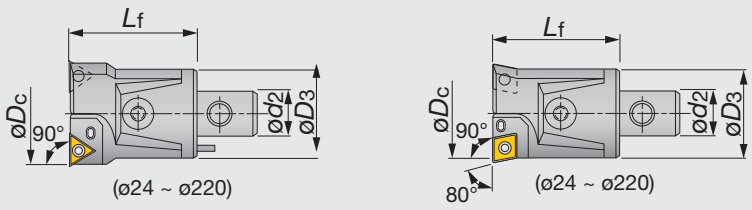
Roughing-Head with 90° approach for dia 24 - 82mm




| Designation | øDc min | øDc max | øD3 | ød2 | Lf | Weight (kg) | Insert |
|---|---|---|---|---|---|---|---|
| D2290400 | 24 | 30 | 22 | 12 | 34 | 0.1 | CC**0602... |
| D2790409 | 29 | 40 | 27 | 15 | 42 | 0.18 | CC**09T3... |
| D3290409 | 39 | 50 | 32 | 20 | 45 | 0.26 | CC**09T3... |
| D4290300 | 49 | 65 | 42 | 24 | 56 | 0.6 | TC**16T3... |
| D4290402N | 53 | 65 | 42 | 24 | 56 | 0.6 | CN**1204... |
| D5490300 | 63 | 82 | 54 | 28 | 66 | 1.1 | TC**16T3... |
| D5490402N | 63 | 82 | 54 | 28 | 66. | 1.1 | CN**1204... |

## D##90_CT

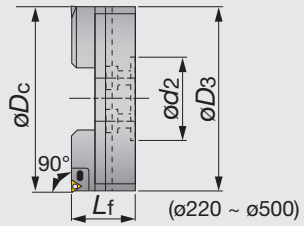
Roughing-Head with 90° approach for dia 80 - 220mm, with cartridge




| Designation | øDc min | øDc max | øD3 | ød2 | Lf | Weight (kg) | Insert |
|---|---|---|---|---|---|---|---|
| D68902CT300 | 80 | 102 | 68 | 36 | 86 | 2.3 | TC**16T3... |
| D68902CT402N | 80 | 102 | 68 | 36 | 86 | 2.3 | CN**1204... |
| D85903CT300 | 100 | 125 | 85 | 50 | 100 | 4.3 | TC**16T3... |
| D85903CT402N | 100 | 125 | 85 | 50 | 100 | 4.3 | CN**1204... |
| D100903CT300 | 125 | 160 | 110 | 60 | 100 | 6.8 | TC**16T3... |
| D100903CT402N | 125 | 160 | 110 | 60 | 100 | 6.8 | CN**1204... |
| D200903CT300 | 160 | 220 | 145 | 60 | 100 | 9 | TC**16T3... |
| D200903CT402N | 160 | 220 | 145 | 60 | 100 | 9 | CN**1204... |

## D##90_CT-Large

Roughing-Head with 90° approach for dia 220 - 320mm, with cartridge



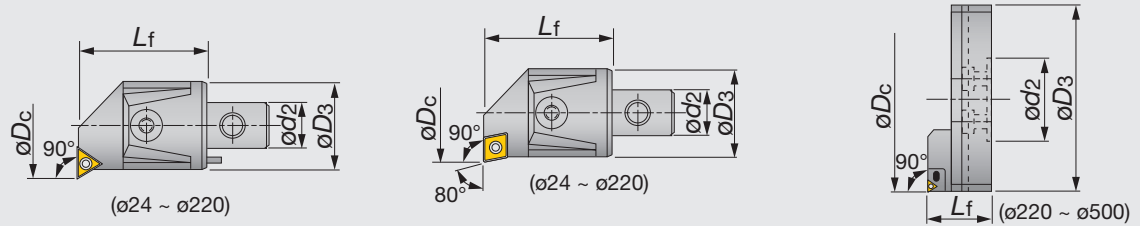

| Designation | øDc min | øDc max | øD3 | ød2 | Lf | Weight (kg) | Insert |
|---|---|---|---|---|---|---|---|
| D300903CT300 | 220 | 320 | 202 | 60 | 90 | 10.1 | TC**16T3... |
| D300903CT402N | 220 | 320 | 202 | 60 | 90 | 10.1 | CN**1204... |

Tooling System

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## A##90

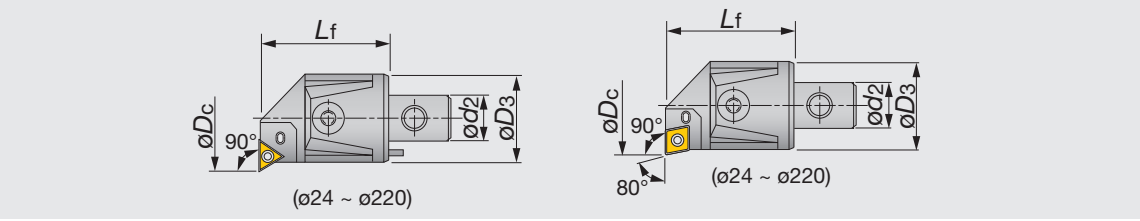
Finishing-Head with 90° approach for dia 24 - 82mm




| Designation | øDc min | øDc max | øD3 | ød2 | Lf | Weight (kg) | Insert |
|---|---|---|---|---|---|---|---|
| A2290400 | 24 | 30 | 22 | 12 | 34 | 0.08 | CC**0602... |
| A2790409 | 29 | 40 | 27 | 15 | 42 | 0.18 | CC**09T3... |
| A3290409 | 39 | 50 | 32 | 20 | 45 | 0.25 | CC**09T3... |
| A4290300 | 49 | 65 | 42 | 24 | 56 | 0.58 | TC**16T3... |
| A4290402N | 53 | 65 | 42 | 24 | 56 | 0.58 | CN**1204... |
| A5490300 | 63 | 82 | 54 | 28 | 66 | 1.05 | TC**16T3... |
| A5490402N | 63 | 82 | 54 | 28 | 66 | 1.05 | CN**1204... |

## A##90_CT

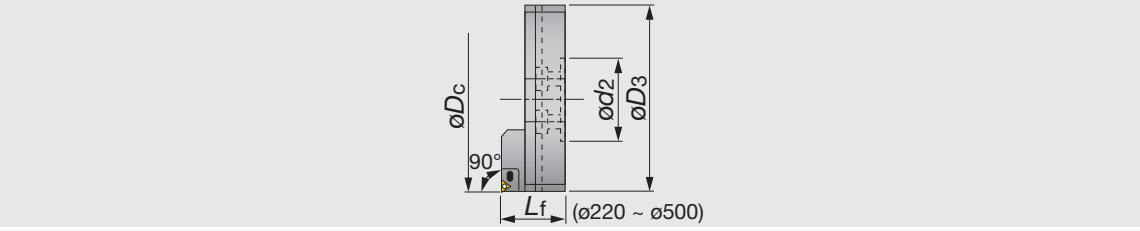
Finishing-Head with 90° approach for dia 80 - 220mm, with cartridge




| Designation | øDc min | øDc max | øD3 | ød2 | Lf | Weight (kg) | Insert |
|---|---|---|---|---|---|---|---|
| A68902CT300 | 80 | 102 | 68 | 36 | 86 | 2.18 | TC**16T3... |
| A68902CT402N | 80 | 102 | 68 | 36 | 86 | 2.18 | CN**1204... |
| A85903CT300 | 100 | 125 | 85 | 50 | 100 | 4.2 | TC**16T3... |
| A85903CT402N | 100 | 125 | 85 | 50 | 100 | 4.2 | CN**1204... |
| A100903CT300 | 125 | 160 | 110 | 60 | 100 | 6.6 | TC**16T3... |
| A100903CT402N | 125 | 160 | 110 | 60 | 100 | 6.6 | CN**1204... |
| A200903CT300 | 160 | 220 | 145 | 60 | 100 | 8.96 | TC**16T3... |
| A200903CT402N | 160 | 220 | 145 | 60 | 100 | 8.96 | CN**1204... |

## A##90_CT-Large

Finishing-Head with 90° approach for dia 220 - 320mm, with cartridge




| Designation | øDc min | øDc max | øD3 | ød2 | Lf | Weight (kg) | Insert |
|---|---|---|---|---|---|---|---|
| A300903CT300 | 220 | 320 | 202 | 60 | 90 | 9.3 | TC**16T3... |
| A300903CT402N | 220 | 320 | 202 | 60 | 90 | 9.3 | CN**1204... |



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## #CT75

Cartridges with 75° approach

Fig. A

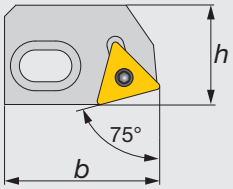
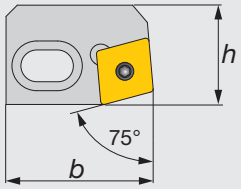



Fig. B




| Designation | *b* | *h* | Insert | Fig |
|---|---|---|---|---|
| 2CT75300 | 35 | 22.5 | TC**16T3... | A |
| 2CT75402N | 35 | 22.5 | CN**1204... | B |
| 3CT75300 | 39 | 28 | TC**16T3... | A |
| 3CT75402N | 39 | 28 | CN**1204... | B |

## #CT90

Cartridges with 90° approach

Fig. A

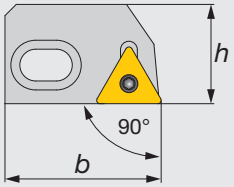
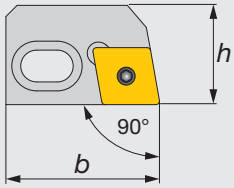


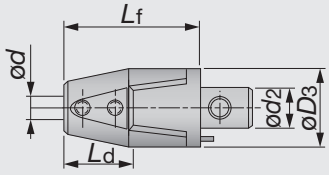

Fig. B




| Designation | *b* | *h* | Insert | Fig |
|---|---|---|---|---|
| 2CT90300 | 35 | 22.5 | TC**16T3... | A |
| 2CT90402N | 35 | 22.5 | CN**1204... | B |
| 3CT90300 | 39 | 28 | TC**16T3... | A |
| 3CT90402N | 39 | 28 | CN**1204... | B |

## A##_Small

Finishing-Head for dia 5.5 - 38mm, with Top-Borer boring bars



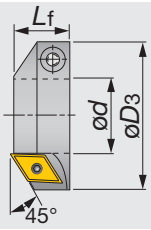

| Designation | ø*D*c min | ø*D*c max | ø*d* | L*d* | ø*D*3 | ø*d*2 | L*f* | Weight (kg) |
|---|---|---|---|---|---|---|---|---|
| A27008 | 5.5 | 21 | 8 | 24 | 27 | 15 | 50 | 0.18 |
| A32010 | 5.5 | 24 | 10 | 29 | 32 | 20 | 58 | 0.37 |
| A42012 | 5.5 | 32 | 12 | 37 | 42 | 24 | 70 | 0.69 |
| A42016 | 5.5 | 38 | 16 | 37 | 42 | 24 | 70 | 0.69 |



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## CH##

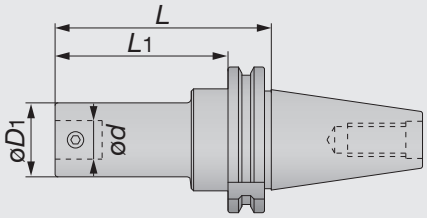
Chamfering tools




| Designation | øD3 | ød | Lf | Weight (kg) | Parts | | | | Insert |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Screw for inserts | Driver | Wrench | Clamping Screw | |
| CH22 | 43 | 22 | 24 | 0.1 | CSTB-4 | T15 | P-4 | M5×20 | DC**11T3... |
| CH27 | 48 | 27 | 24 | 0.18 | CSTB-4 | T15 | P-4 | M5×20 | DC**11T3... |
| CH32 | 62 | 32 | 30 | 0.26 | CSTB-4 | T15 | P-5 | M6×30 | DC**11T3... |
| CH42 | 72 | 42 | 30 | 0.33 | CSTB-4 | T15 | P-5 | M6×35 | DC**11T3... |
| CH54 | 94 | 54 | 40 | 0.77 | CSTB-5 | T20 | P-6 | M8×45 | DC**1504... |
| CH68 | 110 | 68 | 40 | 1.02 | CSTB-5 | T20 | P-8 | M10×50 | DC**1504... |
| CH85 | 145 | 85 | 55 | 2.34 | CSTB-5 | T20 | P-10 | M12×70 | DC**1504... |

## AS30

Arbor with DIN69871 taper



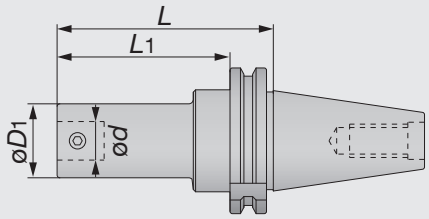

| Designation | øD1 | ød | L | L1 | Weight (kg) | Parts Taper Screw |
|---|---|---|---|---|---|---|
| AS 330 022 100 | 22 | 12 | 104 | 66 | 0.7 | 2268 |
| AS 330 027 055 | 27 | 15 | 48 | 13 | 0.6 | 27610 |
| AS 330 027 100 | 27 | 15 | 96 | 58 | 0.7 | 27610 |
| AS 330 032 060 | 32 | 20 | 51 | 15 | 0.6 | 32810 |
| AS 330 032 100 | 32 | 20 | 93 | 55 | 0.8 | 32810 |



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## AS40

Arbor with DIN69871 taper



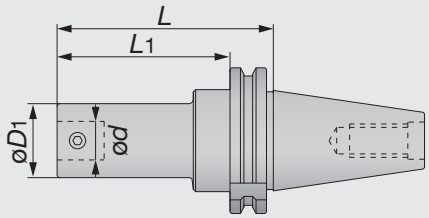

| Designation | ø$D_1$ | ø$d$ | $L$ | $L_1$ | Weight (kg) | Parts Taper Screw |
|---|---|---|---|---|---|---|
| AS 340 022 080 | 22 | 12 | 84 | 46 | 1.23 | 2268 |
| AS 340 022 100 | 22 | 12 | 104 | 66 | 1.3 | 2268 |
| AS 340 027 055 | 27 | 15 | 48 | 13 | 1.13 | 27610 |
| AS 340 027 100 | 27 | 15 | 96 | 58 | 1.35 | 27610 |
| AS 340 027 130 | 27 | 15 | 126 | 88 | 1.49 | 27610 |
| AS 340 032 060 | 32 | 20 | 51 | 15 | 1.14 | 32810 |
| AS 340 032 100 | 32 | 20 | 93 | 55 | 1.4 | 32810 |
| AS 340 032 130 | 32 | 20 | 123 | 85 | 1.59 | 32810 |
| AS 340 042 075 | 42 | 24 | 56 | 19 | 1.2 | 421014 |
| AS 340 042 160 | 42 | 24 | 126 | 104 | 1.98 | 421014 |
| AS 340 042 200 | 42 | 24 | 166 | 144 | 2.46 | 421014 |
| AS 340 054 120 | 54 | 28 | 76 | 54 | 1.63 | 541220 |
| AS 340 054 160 | 54 | 28 | 116 | 94 | 2.36 | 541220 |
| AS 340 054 200 | 54 | 28 | 156 | 134 | 3.11 | 541220 |
| AS 340 068 160 | 68 | 36 | 97 | 74 | 2.48 | 681624 |
| AS 340 068 200 | 68 | 36 | 137 | 114 | 3.63 | 681624 |
| AS 340 085 200 | 85 | 50 | 124 | 100 | 4.24 | 851630 |
| AS 340 100 200 | 100 | 60 | 124 | 100 | 5.16 | 1002035 |



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## AS50

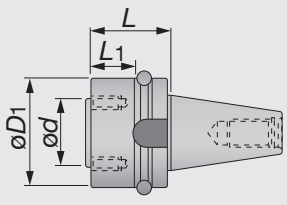
Arbor with DIN69871 taper




| Designation | øD1 | ød | L | L1 | Weight (kg) | Parts Taper Screw |
|---|---|---|---|---|---|---|
| AS 350 022 080 | 22 | 12 | 84 | 46 | 3.45 | 2268 |
| AS 350 022 100 | 22 | 12 | 104 | 66 | 3.5 | 2268 |
| AS 350 027 055 | 27 | 15 | 48 | 13 | 3.3 | 27610 |
| AS 350 027 100 | 27 | 15 | 96 | 58 | 3.55 | 27610 |
| AS 350 027 130 | 27 | 15 | 126 | 88 | 3.68 | 27610 |
| AS 350 032 060 | 32 | 20 | 51 | 15 | 3.31 | 32810 |
| AS 350 032 130 | 32 | 20 | 123 | 85 | 3.79 | 32810 |
| AS 350 032 160 | 32 | 20 | 153 | 115 | 3.98 | 32810 |
| AS 350 042 075 | 42 | 24 | 56 | 19 | 3.39 | 421014 |
| AS 350 042 160 | 42 | 24 | 142 | 104 | 4.36 | 421014 |
| AS 350 042 200 | 42 | 24 | 182 | 144 | 4.86 | 421014 |
| AS 350 054 090 | 54 | 28 | 62 | 24 | 3.57 | 541220 |
| AS 350 054 160 | 54 | 28 | 132 | 94 | 4.85 | 541220 |
| AS 350 054 200 | 54 | 28 | 172 | 134 | 5.57 | 541220 |
| AS 350 068 115 | 68 | 36 | 65 | 29 | 3.74 | 681624 |
| AS 350 068 200 | 68 | 36 | 137 | 114 | 5.8 | 681624 |
| AS 350 068 260 | 68 | 36 | 197 | 174 | 7.6 | 681624 |
| AS 350 085 200 | 85 | 50 | 124 | 100 | 6.3 | 851630 |
| AS 350 085 260 | 85 | 50 | 184 | 160 | 9.04 | 851630 |
| AS 350 085 320 | 85 | 50 | 244 | 220 | 11.7 | 851630 |
| AS 350 100 190 | 100 | 60 | 114 | 90 | 6.6 | 1002035 |
| AS 350 100 260 | 100 | 60 | 184 | 160 | 11 | 1002035 |
| AS 350 100 320 | 100 | 60 | 244 | 220 | 14.66 | 1002035 |

## AS550

Arbor with DIN69871 for large diameter



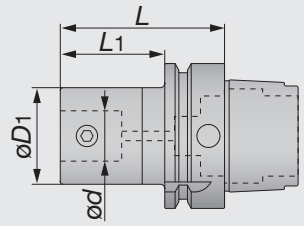

| Designation | øD1 | ød | L | L1 | Weight (kg) | Parts Taper Screw |
|---|---|---|---|---|---|---|
| AS 550 160 | 100 | 60 | 70 | 35 | 5.65 | M12×40 |



PINZBORE® Boring System is a product of MYFHE, S. A.

## HSK50

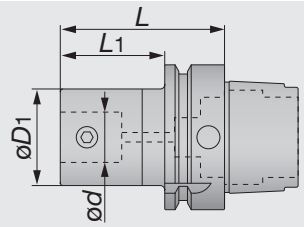
Arbor with HSK A taper




| Designation | øD1 | ød | L | L1 | Weight (kg) | Parts Taper Screw |
|---|---|---|---|---|---|---|
| HSK 050A 022 055 | 22 | 12 | 47 | 21 | 0.49 | 2268 |
| HSK 050A 027 065 | 27 | 15 | 49 | 23 | 0.57 | 27610 |
| HSK 050A 032 075 | 32 | 20 | 56 | 30 | 0.66 | 32810 |
| HSK 050A 042 090 | 42 | 24 | 60 | 34 | 0.73 | 421014 |

## HSK63

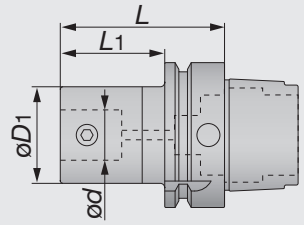
Arbor with HSK A taper




| Designation | øD1 | ød | L | L1 | Weight (kg) | Parts Taper Screw |
|---|---|---|---|---|---|---|
| HSK 063A 022 055 | 22 | 12 | 47 | 21 | 0.75 | 2268 |
| HSK 063A 027 065 | 27 | 15 | 49 | 23 | 0.78 | 27610 |
| HSK 063A 032 075 | 32 | 20 | 56 | 30 | 0.84 | 32810 |
| HSK 063A 042 090 | 42 | 24 | 60 | 34 | 0.98 | 421014 |
| HSK 063A 054 110 | 54 | 28 | 70 | 44 | 1.3 | 541220 |
| HSK 063A 068 145 | 68 | 36 | 85 | 59 | 1.85 | 681624 |

## HSK100

Arbor with HSK A taper

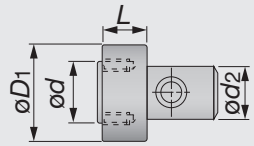



| Designation | øD1 | ød | L | L1 | Weight (kg) | Parts Taper Screw |
|---|---|---|---|---|---|---|
| HSK 100A 022 055 | 22 | 12 | 55 | 21 | 2.28 | 2268 |
| HSK 100A 027 065 | 27 | 15 | 57 | 23 | 2.35 | 27610 |
| HSK 100A 032 075 | 32 | 20 | 59 | 30 | 2.33 | 32810 |
| HSK 100A 042 090 | 42 | 24 | 63 | 34 | 2.47 | 421014 |
| HSK 100A 054 110 | 54 | 28 | 73 | 44 | 2.8 | 541220 |
| HSK 100A 068 145 | 68 | 36 | 88 | 59 | 3.51 | 681624 |
| HSK 100A 085 165 | 85 | 50 | 94 | 65 | 4.15 | 851630 |
| HSK 100A 100 185 | 100 | 60 | 114 | 85 | 5.67 | 1002035 |
| HSK 550 160 | 100 | 60 | 80 | 50 | 5.24 | M12×40 |

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## ADT

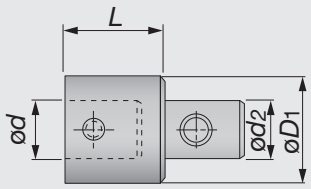
Adaptors for Large dia head




| Designation | øD1 | ød | ød2 | L | Weight (kg) |
|---|---|---|---|---|---|
| ADT10050 | 100 | 60 | 60 | 50 | 4.6 |

## P##

Adaptors / Extension For extending overhang length



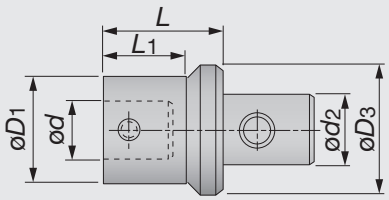

| Designation | øD1 | ød | ød2 | L | Weight (kg) | Parts Taper Screw |
|---|---|---|---|---|---|---|
| P2220 | 22 | 12 | 12 | 20 | 0.1 | 22 68 |
| P2230 | 22 | 12 | 12 | 30 | 0.14 | 22 68 |
| P2730 | 27 | 15 | 15 | 30 | 0.18 | 27 610 |
| P2745 | 27 | 15 | 15 | 45 | 0.25 | 27 610 |
| P3235 | 32 | 20 | 20 | 35 | 0.26 | 32 810 |
| P3252 | 32 | 20 | 20 | 52 | 0.38 | 32 810 |
| P4240 | 42 | 24 | 24 | 40 | 0.48 | 42 1014 |
| P4260 | 42 | 24 | 24 | 60 | 0.7 | 42 1014 |
| P5450 | 54 | 28 | 28 | 50 | 0.95 | 54 1220 |
| P5475 | 54 | 28 | 28 | 75 | 1.4 | 54 1220 |
| P6860 | 68 | 36 | 36 | 60 | 1.8 | 68 1624 |
| P6890 | 68 | 36 | 36 | 90 | 2.6 | 68 1624 |
| P8570 | 85 | 50 | 50 | 70 | 3.05 | 85 1630 |
| P85105 | 85 | 50 | 50 | 105 | 4.45 | 85 1630 |
| P10080 | 100 | 60 | 60 | 80 | 4.6 | 100 2035 |
| P100120 | 100 | 60 | 60 | 120 | 7.1 | 100 2035 |



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## R##

Adaptors / Reducer For using small dia head on large size arbor.




| Designation | øD1 | ød | ød2 | L | L1 | øD3 | Weight (kg) | Parts Taper Screw |
|---|---|---|---|---|---|---|---|---|
| R272236 | 22 | 12 | 15 | 36 | 26 | 27 | 0.2 | 22 68 |
| R322240 | 22 | 12 | 20 | 40 | 30 | 32 | 0.25 | 22 68 |
| R422258 | 22 | 12 | 24 | 58 | 48 | 42 | 0.35 | 22 68 |
| R542286 | 22 | 12 | 28 | 86 | 76 | 54 | 0.65 | 22 68 |
| R6822102 | 22 | 12 | 36 | 102 | 90 | 68 | 1.05 | 22 68 |
| R322734 | 27 | 15 | 20 | 34 | 24 | 32 | 0.25 | 27 610 |
| R422750 | 27 | 15 | 24 | 50 | 40 | 42 | 0.4 | 27 610 |
| R542780 | 27 | 15 | 28 | 80 | 70 | 54 | 0.7 | 27 610 |
| R682795 | 27 | 15 | 36 | 95 | 83 | 68 | 1.05 | 27 610 |
| R423246 | 32 | 20 | 24 | 46 | 36 | 42 | 0.45 | 32 810 |
| R543276 | 32 | 20 | 28 | 76 | 66 | 54 | 0.75 | 32 810 |
| R683290 | 32 | 20 | 36 | 90 | 78 | 68 | 1.2 | 32 810 |
| R544270 | 42 | 24 | 28 | 70 | 60 | 54 | 0.95 | 42 1014 |
| R684282 | 42 | 24 | 36 | 82 | 70 | 68 | 1.4 | 42 1014 |
| R854295 | 42 | 24 | 50 | 95 | 83 | 85 | 2.05 | 42 1014 |
| R685472 | 54 | 28 | 36 | 72 | 60 | 68 | 1.65 | 54 1220 |
| R855490 | 54 | 28 | 50 | 90 | 78 | 85 | 2.5 | 54 1220 |
| R8568100 | 68 | 36 | 50 | 100 | 88 | 85 | 3.35 | 68 1624 |



PINZBORE® Boring System is a product of MYFHE, S. A.

## Roughing boring heads 75° approach

(Designation is written with spaces.)

| Shape | Designation | Screw for insert | Driver | Wrench | Clamping screw | Cartridge | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Adjusting screw | Clamping screw | Washer |
|  | D22 75 400 | CSTB-2.5 | T8 | P-3, P-2 | D22 21 | – | – | – | – |
| | D27 75 409 | CSTB-4M | T15 | P-4, P-2 | D27 21 | – | | | |
| | D32 75 409 | CSTB-4M | T15 | P-4, P-2.5 | D32 21 | – | | | |
| | D42 75 300 | CSTB-4M | T15 | P-5, P-3 | D42 21 | – | | | |
| | D42 75 402N | MLP44 | P-2.5 | P-5, P-3 | D42 21 | – | | | |
| | D54 75 300 | CSTB-4M | T15 | P-6, P-3 | D54 21 | – | | | |
| | D54 75 402N | MLP44 | P-2.5 | P-6, P-3 | D54 21 | – | | | |
| | D68 75 2CT 300 | CSTB-4M | T15 | P-8, P-5, 4, 2 | D68 21 | 2CT 75 300 | D68 29 | D68 27 | D68 28 |
| | D68 75 2CT 402N | MLP44 | P-2.5 | P-8, P-5, 4, 2 | D68 21 | 2CT 75 402N | | | |
| | D85 75 3CT 300 | CSTB-4 | T15 | P-8, P-5, 3 | D85 21 | 3CT 75 300 | D85 29 | D68 27 | D85 28 |
| | D85 75 3CT 402N | MLP44 | P-2.5 | P-8, P-5, 3 | D85 21 | 3CT 75 402N | | | |
| | D100 75 3CT 300 | CSTB-4 | T15 | P-8, P-5, 3 | D100 21 | 3CT 75 300 | | | |
| | D100 75 3CT 402N | MLP44 | P-2.5 | P-8, P-5, 3 | D100 21 | 3CT 75 402N | | | |
| | D200 75 3CT 300 | CSTB-4 | T15 | P-8, P-5, 3 | D100 21 | 3CT 75 300 | | | |
| | D200 75 3CT 402N | MLP44 | P-2.5 | P-8, P-5, 3 | D100 21 | 3CT 75 402N | | | |
| | D300 75 3CT 300 | CSTB-4 | T15 | P-5, P-4, 3 | D300 58 | 3CT 75 300 | | | |
| | D300 75 3CT 402N | MLP44 | P-2.5 | P-5, P-4, 3 | D300 58 | 3CT 75 402N | | | |
| | D400 75 3CT 300 | CSTB-4 | T15 | P-5, P-4, 3 | D300 58 | 3CT 75 300 | | | |
| | D400 75 3CT 402N | MLP44 | P-2.5 | P-5, P-4, 3 | D300 58 | 3CT 75 402N | | | |
| | D500 75 3CT 300 | CSTB-4 | T15 | P-5, P-4, 3 | D300 58 | 3CT 75 300 | | | |
| | D500 75 3CT 402N | MLP44 | P-2.5 | P-5, P-4, 3 | D300 58 | 3CT 75 402N | | | |

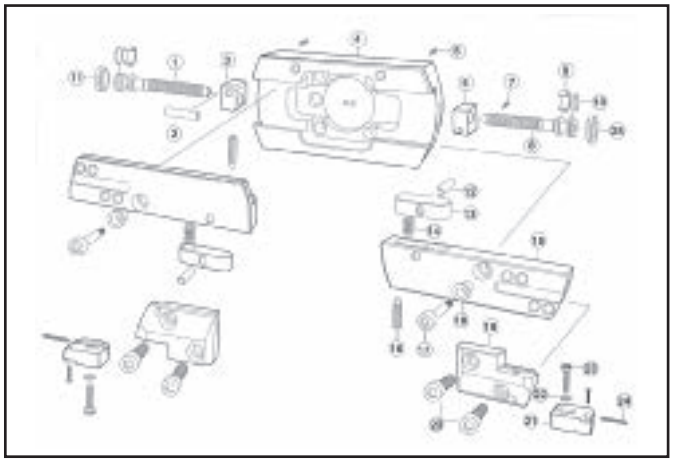
## Roughing boring heads 90° approach

(Designation is written with spaces.)

| Shape | Designation | Screw for insert | Driver | Wrench | Clamping screw | Cartridge | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Adjusting screw | Clamping screw | Washer |
|  | D22 90 400 | CSTB-2.5 | T8 | P-3, P-2 | D22 21 | – | – | – | – |
| | D27 90 409 | CSTB-4M | T15 | P-4, P-2 | D27 21 | – | | | |
| | D32 90 409 | CSTB-4M | T15 | P-4, P-2.5 | D32 21 | – | | | |
| | D42 90 300 | CSTB-4M | T15 | P-5, P-3 | D42 21 | – | | | |
| | D42 90 402N | MLP44 | P-2.5 | P-5, P-3 | D42 21 | – | | | |
| | D54 90 300 | CSTB-4M | T15 | P-6, P-3 | D54 21 | – | | | |
| | D54 90 402N | MLP44 | P-2.5 | P-6, P-3 | D54 21 | – | | | |
| | D68 90 2CT 300 | CSTB-4M | T15 | P-8, P-5, 4, 2 | D68 21 | 2CT 90 300 | D68 29 | D68 27 | D68 28 |
| | D68 90 2CT 402N | MLP44 | P-2.5 | P-8, P-5, 4, 2 | D68 21 | 2CT 90 402N | | | |
| | D85 90 3CT 300 | CSTB-4 | T15 | P-8, P-5, 3 | D85 21 | 3CT 90 300 | D85 29 | D68 27 | D85 28 |
| | D85 90 3CT 402N | MLP44 | P-2.5 | P-8, P-5, 3 | D85 21 | 3CT 90 402N | | | |
| | D100 90 3CT 300 | CSTB-4 | T15 | P-8, P-5, 3 | D100 21 | 3CT 90 300 | | | |
| | D100 90 3CT 402N | MLP44 | P-2.5 | P-8, P-5, 3 | D100 21 | 3CT 90 402N | | | |
| | D200 90 3CT 300 | CSTB-4 | T15 | P-8, P-5, 3 | D100 21 | 3CT 90 300 | | | |
| | D200 90 3CT 402N | MLP44 | P-2.5 | P-8, P-5, 3 | D100 21 | 3CT 90 402N | | | |
| | D300 90 3CT 300 | CSTB-4 | T15 | P-5, P-4, 3 | D300 58 | 3CT 90 300 | | | |
| | D300 90 3CT 402N | MLP44 | P-2.5 | P-5, P-4, 3 | D300 58 | 3CT 90 402N | | | |
| | D400 90 3CT 300 | CSTB-4 | T15 | P-5, P-4, 3 | D300 58 | 3CT 90 300 | | | |
| | D400 90 3CT 402N | MLP44 | P-2.5 | P-5, P-4, 3 | D300 58 | 3CT 90 402N | | | |
| | D500 90 3CT 300 | CSTB-4 | T15 | P-5, P-4, 3 | D300 58 | 3CT 90 300 | | | |
| | D500 90 3CT 402N | MLP44 | P-2.5 | P-5, P-4, 3 | D300 58 | 3CT 90 402N | | | |

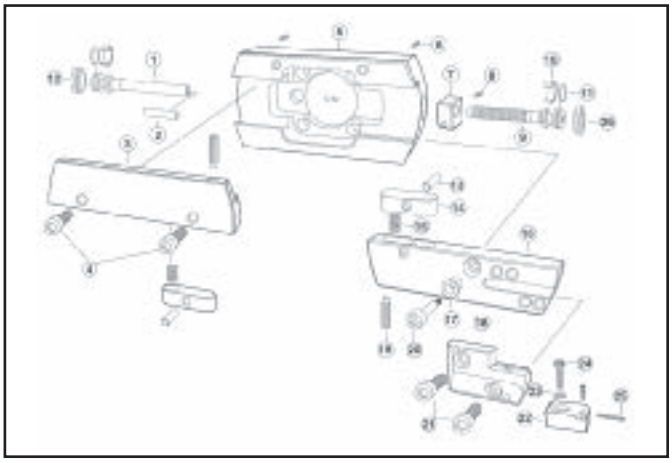
PINZBOHR® Boring System is a tie-up product with MYFHE, S. A.

## Large boring heads (Roughing)



| size | D300□□ □□□ □□□ | D400□□ □□□ □□□ | D500□□ □□□ □□□ |
|---|---|---|---|
| ① | D300 51 | D400 51 | D500 51 |
| ② | D300 66 | D300 66 | D300 66 |
| ③ | D300 55 | D300 55 | D300 55 |
| ④ | D300 03 | D400 03 | D500 03 |
| ⑤ | D68 23 | D68 23 | D68 23 |
| ⑥ | D300 54 | D300 54 | D300 54 |
| ⑦ | D300 65 | D300 65 | D300 65 |
| ⑧ | D300 50 | D400 50 | D500 50 |
| ⑨ | A68 16 | A68 16 | A68 16 |
| ⑩ | A68 25 | A68 25 | A68 25 |
| ⑪ | A68 15 | A68 15 | A68 15 |
| ⑫ | D300 60 | D300 60 | D300 60 |
| ⑬ | D300 56 | D300 56 | D300 56 |
| ⑭ | D300 59 | D300 59 | D300 59 |
| ⑮ | D300 01 | D400 01 | D500 01 |
| ⑯ | D300 58 | D300 58 | D300 58 |
| ⑰ | D300 57 | D300 57 | D300 57 |
| ⑱ | D300 62 | D300 62 | D300 62 |
| ⑲ | D300 49 | D300 49 | D300 49 |
| ⑳ | D300 61 | D300 61 | D300 61 |
| ㉑ | 3CT□□ □□□ | 3CT□□ □□□ | 3CT□□ □□□ |
| ㉒ | D68 28 | D68 28 | D68 28 |
| ㉓ | D85 27 | D85 27 | D85 27 |
| ㉔ | D85 29 | D85 29 | D85 29 |
| ㉕ | D300 15 | D300 15 | D300 15 |

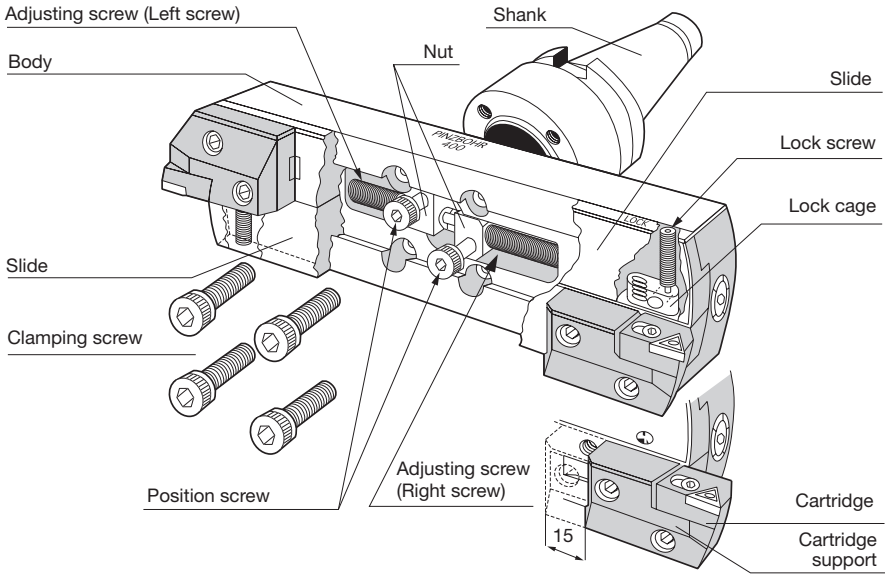
## Large boring heads (Finishing)

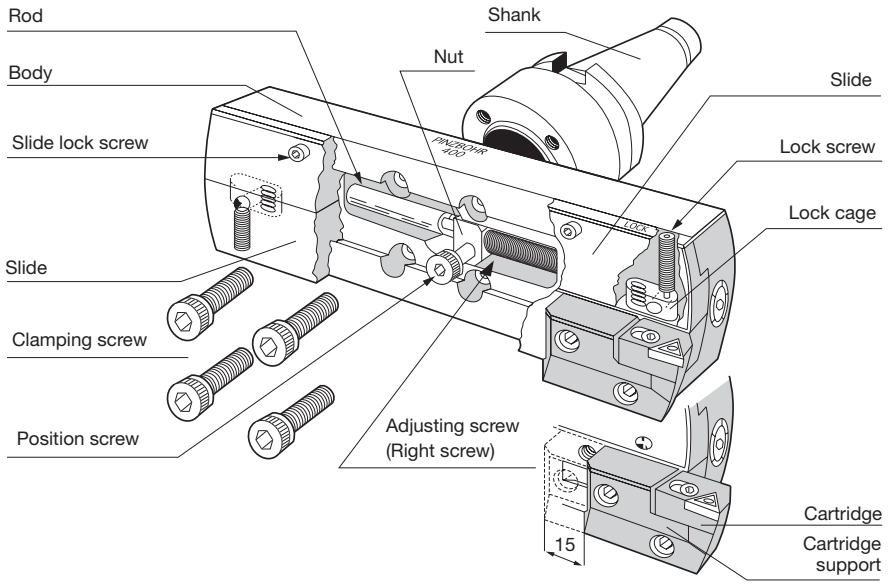


| size | D300□□ □□□ □□□ | D400□□ □□□ □□□ | D500□□ □□□ □□□ |
|---|---|---|---|
| ① | A300 52 | A400 52 | A500 52 |
| ② | D300 66 | D300 66 | D300 66 |
| ③ | A300 02 | A400 02 | A500 02 |
| ④ | A300 63 | A300 63 | A300 63 |
| ⑤ | D300 03 | D400 03 | D500 03 |
| ⑥ | D68 23 | D68 23 | D68 23 |
| ⑦ | D300 54 | D300 54 | D300 54 |
| ⑧ | D300 65 | D300 65 | D300 65 |
| ⑨ | D300 50 | D400 50 | D500 50 |
| ⑩ | A68 16 | A68 16 | A68 16 |
| ⑪ | A68 25 | A68 25 | A68 25 |
| ⑫ | A68 15 | A68 15 | A68 15 |
| ⑬ | D300 60 | D300 60 | D300 60 |
| ⑭ | D300 56 | D300 56 | D300 56 |
| ⑮ | D300 59 | D300 59 | D300 59 |
| ⑯ | D300 01 | D400 01 | D500 01 |
| ⑰ | D300 62 | D300 62 | D300 62 |
| ⑱ | D300 49 | D300 49 | D300 49 |
| ⑲ | D300 58 | D300 58 | D300 58 |
| ⑳ | D300 57 | D300 57 | D300 57 |
| ㉑ | D300 61 | D300 61 | D300 61 |
| ㉒ | 3CT□□ □□□ | 3CT□□ □□□ | 3CT□□ □□□ |
| ㉓ | D68 28 | D68 28 | D68 28 |
| ㉔ | D85 27 | D85 27 | D85 27 |
| ㉕ | D85 29 | D85 29 | D85 29 |
| ㉖ | D300 15 | D300 15 | D300 15 |



PINZBOHR® Boring System is a tie-up product with MYFHE, S. A.



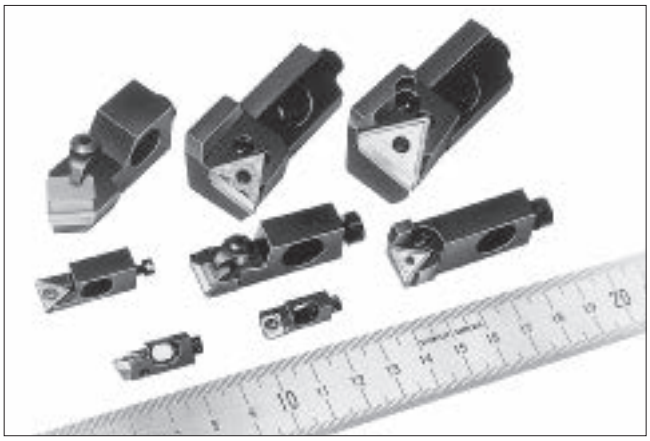






PINZBOHR® Boring System is a tie-up product with MYFHE, S. A.

# Cartridge

## Features of Cartridges



- **Available in a wide range of shank sizes. (06CA ~ 20CA)**
- **Variety of types and sizes for a wide range of boring operations.**

**PN** Pin-lock type, negative rake cartridges excel in tooling economy.

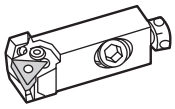
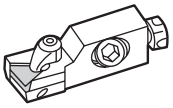
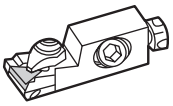
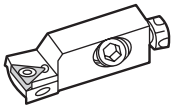
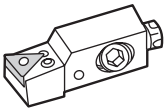
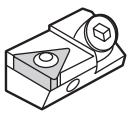
**SP** Screw-on type, positive rake cartridges featuring more free cutting action and machining accuracy.

**CP** Clamp-on type, positive rake cartridges featuring a variety of styles and sizes.

**CE** Clamp-on type, highly positive rake cartridges provide free cutting action and used for machining non-ferrous metals.

**PNE** Pin-lock type, negative rake cartridges used only for external machining.

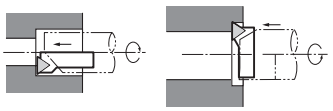
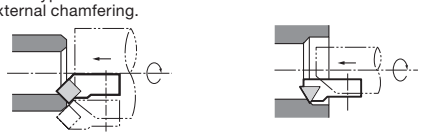
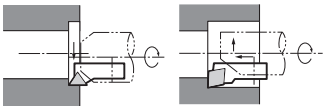
## List of Cartridges

| Type | Appearance | Size | Min. bore dia ø (mm) | Cutting edge height (mm) | Rake angle | Applicable Insert | | Clamping mechanism | No. of items | Features and notes |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Relief angle | Hole | | | |
| **PN** |  | 10CA | 40 | 10 | Negative | 0° | With ISO hole | Pin-lock | 12 | • Excellent in economy |
| | | 12CA | 50 | 12 | | | | | 14 | |
| | | 16CA | 60 | 16 | | | | | 14 | |
| | | 20CA | 70 | 20 | | | | | 10 | |
| **CP** |  | 10CA | 40 | 10 | Positive | 11° | Without | Clamp-on | 16 | • Tough insert<br>• Variety of styles and sizes |
| | | 12CA | 50 | 12 | | | | | 16 | |
| | | 16CA | 60 | 16 | | | | | 16 | |
| | | 20CA | 70 | 20 | | | | | 2 | |
| **CE** |  | 10CA | 40 | 10 | Positive | 20° | Without | Clamp-on | 16 | • More free cutting action<br>• Best suitable for machining non-ferrous metals |
| | | 12CA | 50 | 12 | | | | | 16 | |
| | | | | | | | | | | |
| **SP** |  | 06CA | 20 | 6 | Positive | 11° | With ISO hole | Screw-on | 10 | • Provides free cutting action<br>• Good chip control |
| | | 08CA | 25 | 8 | | | | | 10 | |
| | | 10CA | 40 | 10 | | | | | 16 | |
| | | 12CA | 50 | 12 | | | | | 16 | |
| **PNE** |  | 10CA | – | 10 | Negative | 0° | With ISO hole | Pin-lock | 8 | • For external use<br>• Made to order |
| | | 12CA | – | 12 | | | | | 10 | |
| | | | | | | | | | | |
| **A** |  | (09CA) (Corresponds to 09CA | 32 | 9 | Positive | 11° | With Tungaloy's standard hole | Screw-on | 12 | • Mini-cartridge |
| | | | | | | | | | | |

Note: Min. bore diameters shown above are for axial mounting.

Tooling System

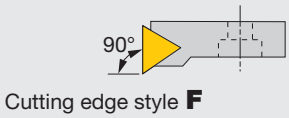
# List of ISO Standard Cartridges by Application

| Type | Boring | | Chamfering and boring | | | Facing and boring | |
|---|---|---|---|---|---|---|---|
| |  | | External and internal 45-chamfering<br>Note: PSSN type can not be used for external chamfering.<br>  | | |  | |
| **PN** | Cutting edge angle 85°<br>Style Y<br>85°<br>**PSYN** F167 | Cutting edge angle 75°<br>Style K<br>75°<br>**PSKN** F158 | Cutting edge angle 30°<br>Style T<br>30°<br>**PTTN** F165 | Cutting edge angle 45°<br>Style S<br>45°<br>**PSSN** F162 | | Cutting edge angle 0°<br>Style G<br>90°<br>**PTGN** F156 | Cutting edge angle 5°<br>5° Style L<br>5°<br>**PCLN** F160 |
| | Cutting edge angle 90°<br>Style F<br>90°<br>**PTFN** F154 | Cutting edge angle 0°<br>Style G<br>90°<br>**PTGN** F156 | | | | | |
| **CP** | Cutting edge angle 85°<br>Style Y<br>85°<br>**CSYP** F168 | Cutting edge angle 75°<br>Style K<br>75°<br>**CSKP** F158 | Cutting edge angle 30°<br>Style T<br>30°<br>**CTTP** F166 | Cutting edge angle 45°<br>Style S (Square insert)<br>45°<br>**CSSP** F162<br>**CTSP** F164 | Cutting edge angle 60°<br>Style W<br>60°<br>**CTWP** F161 | Cutting edge angle 0°<br>Style G<br>90°<br>**CTGP** F156 | |
| | Cutting edge angle 90°<br>Style F<br>90°<br>**CTFP** F154 | Cutting edge angle 0°<br>Style G<br>90°<br>**CTGP** F156 | | | | | |
| **CE** | Cutting edge angle 75°<br>Style K<br>75°<br>**CSKE** F159 | | Cutting edge angle 30°<br>Style T<br>30°<br>**CTTE** F167 | Cutting edge angle 45°<br>Style S (Square insert)<br>45°<br>**CSSE** F163<br>**CTSE** F178 | | Cutting edge angle 0°<br>Style G<br>90°<br>**CTGE** F157 | |
| | Cutting edge angle 90°<br>Style F<br>90°<br>**CTFE** F155 | Cutting edge angle 0°<br>Style G<br>90°<br>**CTGE** F157 | | | | | |
| **SP** | Cutting edge angle 85°<br>Style Y<br>85°<br>**SSYP** F168 | Cutting edge angle 75°<br>Style K<br>75°<br>**SSKP** F159 | Cutting edge angle 30°<br>Style T<br>(80° rhombic only for 06CA)<br>30°<br>**STTP** F167<br>**SCTP** F167 (06CA) | Cutting edge angle 45°<br>Style S (Square insert)<br>(80° rhombic only for 06CA)<br>45°<br>**SSSP** F163<br>**STSP** F165<br>**SCSP** F165 (06CA) | Cutting edge angle 60°<br>Style W<br>60°<br>**STWP** F161 | Cutting edge angle 0°<br>Style G<br>90°<br>**STGP** F157 | Cutting edge angle 5°<br>5° Style L<br>5°<br>**SCLP** F160 (06CA) |
| | Cutting edge angle 90°<br>Style F<br>(80° rhombic only for 06CA)<br>90°<br>**STFP** F155<br>**SCFP** F155 (06CA) | Cutting edge angle 0°<br>Style G<br>90°<br>**STGP** F157 | | | | | |

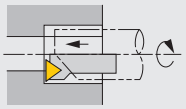
Tooling System

## PN PTFN-CA

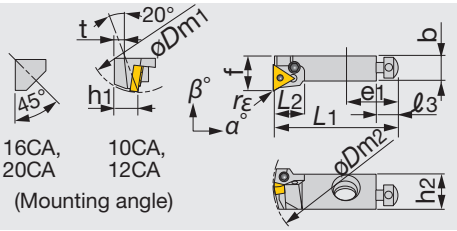
Lever lock cartridge with 90° approach angle for negative triangule insert




Cutting edge style **F**



Main application
Shoulder boring




16CA, 20CA 10CA, 12CA

(Mounting angle)

Right hand (R) shown. 80° rhombic insert used for 06CA.

| Designation | øDm1 | øDm2 | rε** | f | L1 | L2 | h1 | h2 | b | e1 | ℓ3 | β° | α° | t | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PTFNR/L10CA-11 | 40 | 55 | 0.4 | 14 | 50 | 12 | 10 | 14.5 | 10 | 20 | 8 | -6 | -8 | 5 | TN**1103... |
| PTFNR/L12CA-16 | 50 | 75 | 0.8 | 20 | 55 | 16 | 12 | 19.5 | 15 | 20 | 8 | -6 | -8 | 6 | TN**1604... |
| PTFNR/L16CA | 55 | - | 0.8 | 25 | 63 | 23 | 16 | 16 | 17 | 25 | 8 | -6 | -8 | 0 | TN**1604... |
| PTFNR/L20CA | 70 | - | 0.8 | 25 | 70 | 28 | 20 | 20 | 19 | 30 | 10 | -6 | -7 | 0 | TN**2204... |

Note: • In above table, øDm1 is min. bore dia. for axial mounting and øDm2 is for radial mounting.
• When using a right or left hand insert, the right hand insert is used for left hand toolholders and the left hand insert is used for right hand toolholders.
• The left hand insert is used for the right hand cartridge and right hand insert is used for left hand cartridge.
• **rε: Standard corner radius

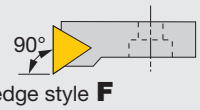
### SPARE PARTS

| Designation | Shim | Lever | Clamping screw | Axial adjusting screw | Radial adjusting screw | Cartridge setting screw | Wrench | Shim retainer | Sizing plate (1) | Sizing plate ass'y (1) |
|---|---|---|---|---|---|---|---|---|---|---|
| PTFNR/L10CA-11 | - | LCL22N | LCS22 | ASM54 | SSHM4-4 | CHHM6-15 | P-2F,P-5 | - | - | PSTR/L10 |
| PTFNR/L12CA-16 | - | LCL33N | LCS33 | ASM54 | SSHM4-4 | CHHM6-25 | P-2F,P-5 | - | - | PSTR/L12 |
| PTFNR/L16CA | LST317CA | LCL3 | LCS3 | ASM6 | SSHM5-6 | BHM8-25U | P-2.5,P-5 | LSP3 | S0816B/S1016B | - |
| PTFNR/L20CA | LST42CA | LCL4 | LCS4 | ASM6 | SSHM5-6 | BHM8-30U | P-2.5,P-3,P-5 | LSP4 | S0820B/S1020B | - |

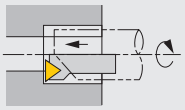
(1) Optional

## CP CTFP-CA

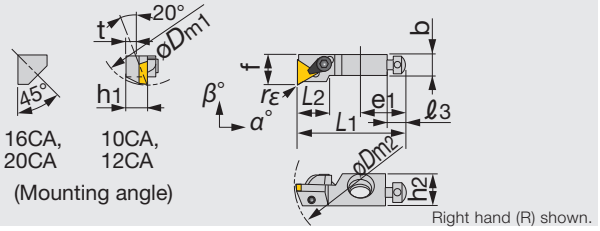
Clamp on cartridge with 90° approach angle for 11° clearance triangle insert




Cutting edge style **F**



Main application
Shoulder boring




16CA, 20CA 10CA, 12CA

(Mounting angle)

Right hand (R) shown.

| Designation | øDm1 | øDm2 | rε** | f | L1 | L2 | h1 | h2 | b | e1 | ℓ3 | β° | α° | t | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CTFPR/L10CA-11 | 40 | 55 | 0.4 | 14 | 50 | 15 | 10 | 14.5 | 10 | 20 | 8 | 4 | 0 | 5 | TP**1103... |
| CTFPR/L12CA-16 | 50 | 75 | 0.8 | 20 | 55 | 17 | 12 | 19.5 | 15 | 20 | 8 | 5 | 2 | 6 | TP**1603... |
| CTFPR/L16CA | 55 | - | 0.8 | 25 | 63 | 23 | 16 | 16 | 17 | 25 | 8 | 5 | 0 | 0 | TP**1603... |
| CTFPR/L20CA | 70 | - | 0.8 | 25 | 70 | 22 | 20 | 20 | 19 | 30 | 10 | 5 | 0 | 0 | TP**2204... |

Note: • In above table, øDm1 is min. bore dia. for axial mounting and øDm2 is for radial mounting.
• When using a right or left hand insert, the right hand insert is used for left hand cartridge and the left hand insert is used for right hand cartridge.
• The left hand insert is used for the right hand cartridge and right hand insert is used for left hand cartridge.
• **rε: Standard corner radius

### SPARE PARTS

| Designation | Shim | Lever | Clamping screw | Axial adjusting screw | Radial adjusting screw | Cartridge setting screw | Wrench | Chipbreaker piece | Shim retainer | Sizing plate ass'y |
|---|---|---|---|---|---|---|---|---|---|---|
| CTFPR/L10CA-11 | - | - | CSG-5 (CSG-5S) | ASM54 | SSHM4-10 | CHHM6-15 | P-2,P-2.5,P-5 | CBT-2M | - | PSTR/L10 |
| CTFPR/L12CA-16 | - | - | CSG-6 (CSG-6S) | ASM54 | SSHM4-14 | CHHM6-25 | P-2,P-3,P-5 | CBT-3M | - | PSTR/L12 |
| CTFPR/L16CA | PAT-32 | SM3X0.5X8 | CSG-8S | ASM6 | SSHM5-16 | BHM8-25U | P-2.5,P-4 | - | S0816B/S1016B | - |
| CTFPR/L20CA | PAT-42 | SM3X0.5X8 | CSG-8 | ASM6 | SSHM6-16 | BHM8-30U | P-3,P-4 | - | S0820B/S1020B | - |

Notes : Cartridges of K-style cutting edge uses S0816A or S1016A,whilst ones of S-style uses S0816C or S1016B (*marked).
When not using Chipbreaker piece, clamping screw in ( ) should be used.

(1) Optional

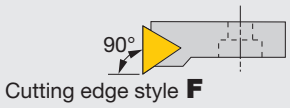


Inserts for PN PTFN-CA → **B079 -**, CBN → **B164 -**, PCD → **B176**

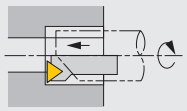
Inserts for CP CTFP-CA → **B131 -**, CBN → **B168 -**, PCD → **B178**

## CE CTFE-CA

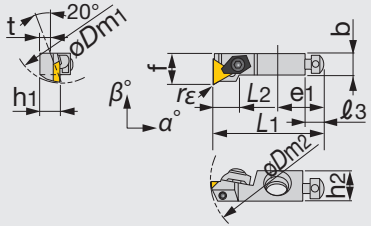
Clamp on cartridge with 90° approach angle for 20° clearance triangle insert




Cutting edge style **F**



Main application
Shoulder boring




Right hand (R) shown.

| Designation | øDm1 | øDm2 | rε** | f | L1 | L2 | h1 | h2 | b | e1 | ℓ3 | β° | α° | t | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CTFER/L10CA-11 | 40 | 55 | 0.4 | 14 | 50 | 12 | 10 | 14.5 | 10 | 20 | 8 | 10 | 5 | 5 | TE**1103... |
| CTFER12CA-16 | 50 | 75 | 0.8 | 20 | 55 | 18 | 12 | 19.5 | 15 | 20 | 8 | 10. | 5 | 6 | TE**1603... |

Note: • In above table, øDm1 is min. bore dia. for axial mounting and øDm2 is for radial mounting.
- When using a right or left hand insert, the right hand insert is used for left hand cartridge and the left hand insert is used for right hand cartridge.
- The left hand insert is used for the right hand cartridge and right hand insert is used for left hand cartridge.
- **rε: Standard corner radius

### SPARE PARTS

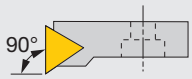
| Designation | Clamp set | Axial adjusting screw | Radial adjusting screw | Cartridge setting screw | Wrench | Chipbreaker piece | Sizing plate ass'y (1) |
|---|---|---|---|---|---|---|---|
| CTFER/L10CA-11 | CSW-40 | ASM54 | SSHM4-8 | CHHM6-15 | P-2,P-2.5,P-5 | CBT-2M | PSTR/L10 |
| CTFER/L12CA-16 | CSW-50 | ASM54 | SSHM4-14 | CHHM6-25 | P-2,P-3,P-5 | CBT-3M | PSTR/L12 |

(1) Optional

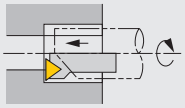
## SP STFP-CA / SCFP-CA

Screw on cartridge with 90° approach angle for 11° clearance triangle insert / rhombic insert

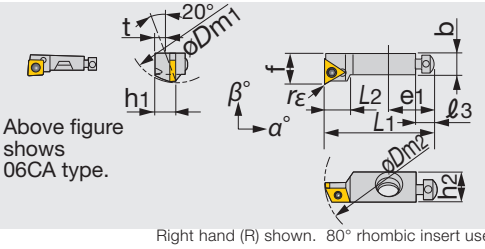
80° rhombic for 06CA only




Cutting edge style **F**



Main application
Shoulder boring




Above figure shows 06CA type.

Right hand (R) shown. 80° rhombic insert used for 06CA.

| Designation | øDm1 | øDm2 | rε** | f | L1 | L2 | h1 | h2 | b | e1 | ℓ3 | β° | α° | t | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SCFPR/L06CA-05 | 20 | 30 | 0.4 | 8 | 25 | 8.5 | 6 | 7.5 | 5.5 | 12 | 4.5 | 0 | 0 | 3.5 | CP**0502... |
| STFPR/L08CA-09 | 25 | 35 | 0.4 | 10 | 32 | 10 | 8 | 11.5 | 7.5 | 17 | 6 | 4 | 0 | 4.5 | TP**0902... |
| STFPR/L10CA-11 | 40 | 55 | 0.4 | 14 | 50 | 12 | 10 | 14.5 | 10 | 20 | 8 | 4 | 0 | 5 | TP**1102... |
| STFPR/L12CA-16 | 50 | 75 | 0.8 | 20 | 55 | 17 | 12 | 19.5 | 15 | 20 | 8 | 5 | 2 | 6 | TP**16T3... |

Note: • In above table, øDm1 is min. bore dia. for axial mounting and øDm2 is for radial mounting.
- When using a right or left hand insert, the right hand insert is used for left hand cartridge and the left hand insert is used for right hand cartridge.
- The left hand insert is used for the right hand cartridge and right hand insert is used for left hand cartridge.
- **rε: Standard corner radius

### SPARE PARTS

| Designation | Clamping screw | Axial adjusting screw | Radial adjusting screw | Cartridge setting screw | Wrench | Torx wrench | Sizing plate ass'y (1) |
|---|---|---|---|---|---|---|---|
| SCFPR/L06CA-05 | CSTB-2.2S | ASM34S | SSHM3-6 | CHHM3.5-10 | P-1.5,P-3 | T-7F | PT06 |
| STFPR/L08CA-09 | CSTB-2.2S | ASM34L | SSHM3-6 | CHHM4-10 | P-1.5,P-3 | T-7F | PSTR/L08 |
| STFPR/L10CA-11 | CSTB-2.5 | ASM54 | SSHM4-10 | CHHM6-15 | P-2,P-5 | T-8F | PSTR/L10 |
| STFPR/L12CA-16 | CSTB-4S | ASM54 | SSHM4-14 | CHHM6-25 | P-2,P-5 | T-15F | PSTR/L12 |

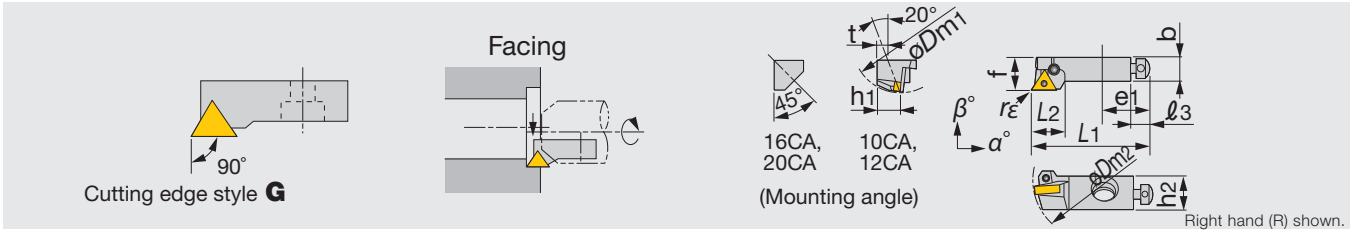
(1) Optional

Inserts for CE CTFE-CA → **Special**

Inserts for SP STFP-CA → **B112** (CP**), **B131 -** (TP**), CBN → **B168 -**, PCD → **B178**

## PN PTGN-CA

Lever lock cartridge with 90° approach angle for negative triangule inserts




Right hand (R) shown.

| Designation | øDm1 | øDm2 | rε** | f | L1 | L2 | h1 | h2 | b | e1 | ℓ3 | β° | α° | t | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PTGNR/L10CA-11 | 40 | 55 | 0.4 | 14 | 50 | 14 | 10 | 14.5 | 10 | 20 | 8 | -6 | -8 | 5 | TN**1103... |
| PTGNR/L12CA-16 | 50 | 75 | 0.8 | 20 | 55 | 20 | 12 | 19.5 | 15 | 20 | 8 | -6 | -8 | 5 | TN**1604... |
| PTGNR/L16CA | 60 | 75 | 0.8 | 25 | 63 | 23 | 16 | 16 | 17 | 25 | 8 | -6 | -10 | 0 | TN**1604... |
| PTGNR20CA | 70 | 90 | 0.8 | 25 | 70 | 28 | 20 | 20 | 19 | 30 | 10 | -6 | -8 | 0 | TN**2204... |

Note: • In above table, øDm1 is min. bore dia. for axial mounting and øDm2 is for radial mounting.
• **rε: Standard corner radius

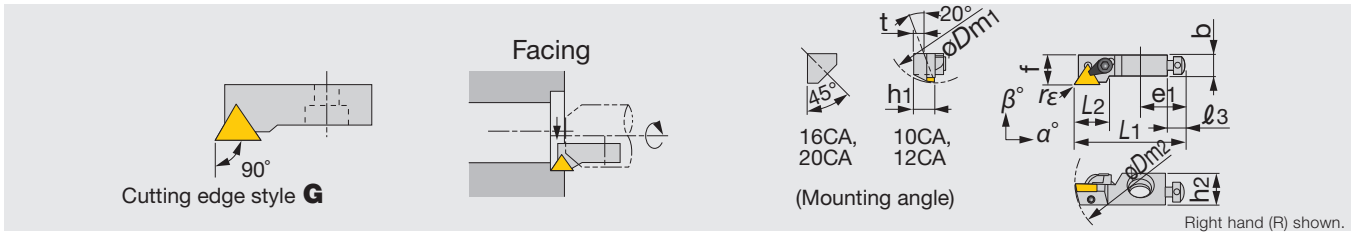
### SPARE PARTS

| Designation | Shim | Lever | Clamping screw | Axial adjusting screw | Radial adjusting screw | Cartridge setting screw | Wrench | Shim retainer | Sizing plate (1) | Sizing plate ass'y (1) |
|---|---|---|---|---|---|---|---|---|---|---|
| PTGNR/L10CA-11 | - | LCL22N | LCS22 | ASM54 | SSHM4-4 | CHHM6-15 | P-2F,P-5 | - | - | PSTR/L10 |
| PTGNR/L12CA-16 | - | LCL33N | LCS33 | ASM54 | SSHM4-4 | CHHM6-25 | P-2F,P-5 | - | - | PSTR/L12 |
| PTGNR/L16CA | LST317CA | LCL3 | LCS3 | ASM6 | SSHM5-6 | BHM8-25U | P-2.5,P-5 | LSP3 | S0816B/S1016B | - |
| PTGNR/L20CA | LST42CA | LCL4 | LCS4 | ASM6 | SSHM5-6 | BHM8-30U | P-2.5,P-3,P-5 | LSP4 | S0820B/S1020B | - |

(1) Optional

## CP CTGP-CA

Clamp on cartridge with 90° approach angle for 11° clearance triangle insert




Right hand (R) shown.

| Designation | øDm1 | øDm2 | rε** | f | L1 | L2 | h1 | h2 | b | e1 | ℓ3 | β° | α° | t | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CTGPR/L10CA-11 | 40 | 55 | 0.4 | 14 | 50 | 16 | 10 | 14.5 | 10 | 20 | 8 | 4 | 0 | 5 | TP**1103... |
| CTGPR/L12CA-16 | 50 | 75 | 0.8 | 20 | 55 | 21 | 12 | 19.5 | 15 | 20 | 8 | 3 | 2 | 5 | TP**1603... |
| CTGPL16CA | 55 | 75 | 0.8 | 25 | 63 | 25 | 16 | 16 | 17 | 25 | 8 | 0 | 0 | 0 | TP**1603... |

Note: • In above table, øDm1 is min. bore dia. for axial mounting and øDm2 is for radial mounting.
• **rε: Standard corner radius

### SPARE PARTS

| Designation | Shim | Lever | Clamp set | Axial adjusting screw | Radial adjusting screw | Cartridge setting screw | Wrench | Chipbreaker piece | Shim retainer (1) | Sizing plate ass'y (1) |
|---|---|---|---|---|---|---|---|---|---|---|
| CTGPR/L10CA-11 | - | - | CSG-5 (CSG-5S) | ASM54 | SSHM4-10 | CHHM6-15 | P-2,P-2.5,P-5 | CBT-2M | - | PSTR/L10 |
| CTGPR/L12CA-16 | - | - | CSG-6 (CSG-6S) | ASM54 | SSHM4-14 | CHHM6-25 | P-2,P-3,P-5 | CBT-3M | - | PSTR/L12 |
| CTGPR/L16CA | PAT-32 | SM3X0.5X8 | CSG-8S | ASM6 | SSHM5-16 | BHM8-25U | P-2.5,P-4 | - | S0816B/S1016B | - |

(1) Optional

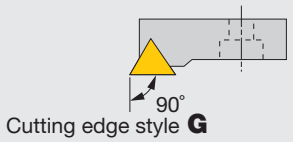


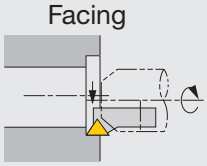
Inserts for PN PTGN-CA → **B079 -,** CBN → **B164 -,** PCD → **B176**

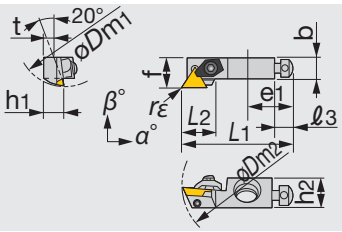
Inserts for CP CTGP-CA → **B131 -,** CBN → **B168 -,** PCD → **B178**

## CE CTGE-CA

Clamp on cartridge with 90° approach angle for 20° clearance triangle insert




Right hand (R) shown.

| Designation | øDm1 | øDm2 | rε** | f | L1 | L2 | h1 | h2 | b | e1 | ℓ3 | β° | α° | t | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CTGER/L10CA-11 | 40 | 55 | 0.4 | 14 | 50 | 15 | 10 | 14.5 | 10 | 20 | 8 | 5 | 10 | 5 | TE**1103... |
| CTGER/L12CA-16 | 50 | 75 | 0.8 | 20 | 55 | 20 | 12 | 19.5 | 15 | 20 | 8 | 5 | 10 | 6 | TE**1603... |

**rε: Standard corner radius

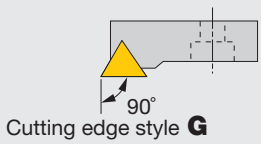
### SPARE PARTS

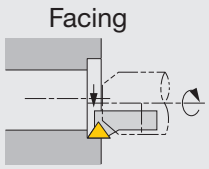
| Designation | Clamp set | Axial adjusting screw | Radial adjusting screw | Cartridge setting screw | Wrench | Chipbreaker piece | Sizing plate ass'y |
|---|---|---|---|---|---|---|---|
| CTGER/L10CA-11 | CSW-40 | ASM54 | SSHM4-8 | CHHM6-15 | P-2,P-2.5,P-5 | CBT-2M | PSTR/L10 |
| CTGER/L12CA-16 | CSW-50 | ASM54 | SSHM4-14 | CHHM6-25 | P-2,P-3,P-5 | CBT-3M | PSTR/L12 |

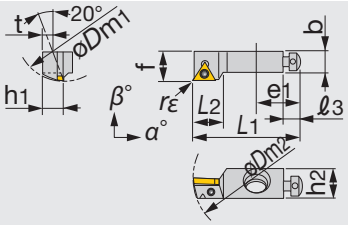
(1) Optional

## SP STGP-CA

Screw on cartridge with 90° approach angle for 11° clearance triangle insert




Right hand (R) shown.

| Designation | øDm1 | øDm2 | rε** | f | L1 | L2 | h1 | h2 | b | e1 | ℓ3 | β° | α° | t | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| STGPR/L08CA-09 | 25 | 35 | 0.4 | 10 | 32 | 10.9 | 8 | 11.5 | 7.5 | 17 | 6 | 4 | 0 | 6 | TP**0902... |
| STGPR/L10CA-11 | 40 | 55 | 0.4 | 14 | 50 | 14 | 10 | 14.5 | 10 | 20 | 8 | 4 | 0 | 8 | TP**1102... |
| STGPL12CA-16 | 50 | 75 | 0.8 | 20 | 55 | 19 | 12 | 19.5 | 15 | 20 | 8 | 5 | 2 | 8 | TP**16T3... |

**rε: Standard corner radius

### SPARE PARTS

| Designation | Clamping screw | Axial adjusting screw | Radial adjusting screw | Cartridge setting screw | Wrench | Torx wrench | Sizing plate ass'y |
|---|---|---|---|---|---|---|---|
| STGPR/L08CA-09 | CSTB-2.2S | ASM34L | SSHM3-6 | CHHM4-10 | P-1.5,P-3 | T-7F | PSTR/L08 |
| STGPR/L10CA-11 | CSTB-2.5 | ASM54 | SSHM4-10 | CHHM6-15 | P-2,P-5 | T-8F | PSTR/L10 |
| STGPR/L12CA-16 | CSTB-4S | ASM54 | SSHM4-14 | CHHM6-25 | P-2,P-5 | T-15F | PSTR/L12 |

(1) Optional

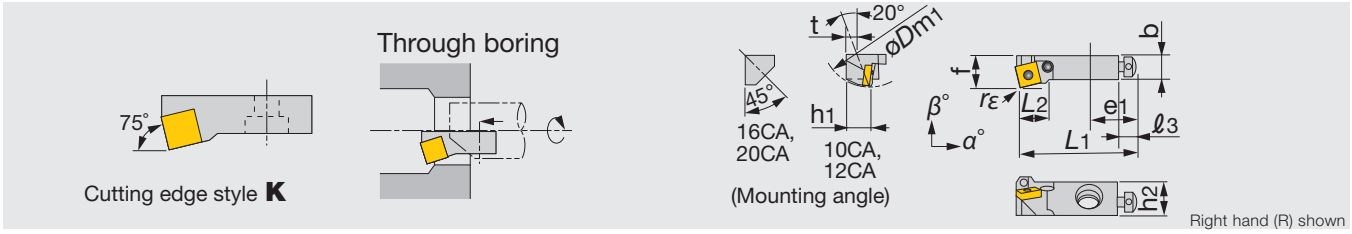


Inserts for CE CTGE-CA → **Special**

Inserts for CP STGP-CA → **B131 -,** CBN → **B168 -,** PCD → **B178**

## PN PSKN-CA

Lever lock cartridge with 75° approach angle for negative square insert




| Designation | øDm1 | rε** | f | L1 | L2 | h1 | h2 | b | e1 | ℓ3 | β° | α° | t | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PSKNR10CA-09 | 40 | 0.8 | 14 | 50 | 12 | 10 | 14.5 | 10 | 20 | 8. | -6 | -8 | 5 | SN**0903... |
| PSKNR/L12CA-12 | 50 | 0.8 | 20 | 55 | 16 | 12 | 19.5 | 15 | 20 | 8 | -6 | -8 | 5 | SN**1204... |
| PSKNR/L16CA | 55 | 0.8 | 25 | 63 | 23 | 16 | 16 | 17 | 25 | 8 | -6 | -8 | 0 | SN**1204... |
| PSKNR20CA | 70 | 1.2 | 25 | 70 | 28 | 20 | 20 | 19 | 30 | 10 | -6 | -7 | 0 | SN**1506... |

Note: • In above table, øDm1 is min. bore dia. for axial mounting and øDm2 is for radial mounting.
• When using a right or left hand insert, the right hand insert is used for left hand cartridge and the left hand insert is used for right hand cartridge.
• The left hand insert is used for the right hand cartridge and right hand insert is used for left hand cartridge.
• **rε: Standard corner radius

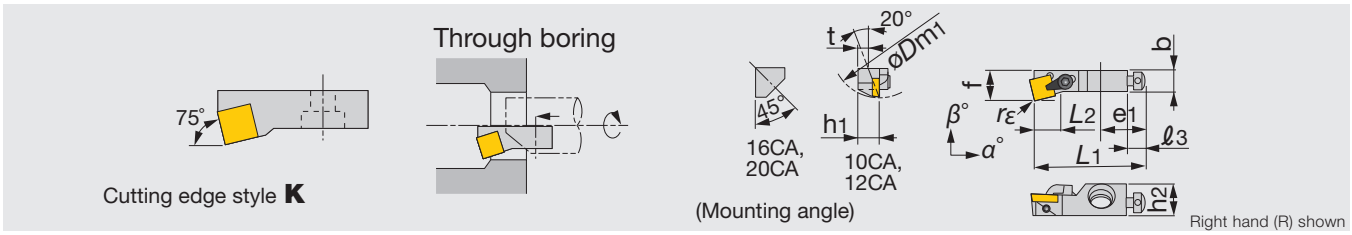
### SPARE PARTS

| Designation | Shim | Lever | Clamping screw | Axial adjusting screw | Radial adjusting screw | Cartridge setting screw | Wrench | Shim retainer | Sizing plate (1) | Sizing plate ass'y (1) |
|---|---|---|---|---|---|---|---|---|---|---|
| PSKNR/L10CA-09 | - | LCL32N | LCS22 | ASM54 | SSHM4-4 | CHHM4-4 | P-2F,P-5 | - | - | PSTR/L10 |
| PSKNR/L12CA-12 | - | LCL43N | LCS43 | ASM54 | SSHM4-4 | CHHM6-25 | P-2,P-2.5,P-5 | - | - | PSTR/L12 |
| PSKNR/L16CA | LSS42CA | LCL4 | LCS4CA | ASM6 | SSHM5-6 | BHM8-25U | P-2.5,P-3,P-5 | LSP4 | S0816B/S1016B | - |
| PSKNR/L20CA | LSS53CA | LCL5 | LCS5CA | ASM6 | SSHM5-6 | BHM8-30U | P-2.5,P-3,P-5 | LSP5 | S0820B/S1020B | - |

(1) Optional

## CP CSKP-CA

Clamp on cartridge with 75° approach angle for 11° clearance square insert




| Designation | øDm1 | rε** | f | L1 | L2 | h1 | h2 | b | e1 | ℓ3 | β° | α° | t | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CSKPR/L10CA-09 | 40 | 0.8 | 14 | 50 | 12 | 10 | 14.5 | 10 | 20 | 8 | 5 | 0 | 5 | SP**0903... |
| CSKPR/L12CA-12 | 50 | 0.8 | 20 | 55 | 17 | 12 | 19.5 | 15 | 20 | 8 | 5 | 2 | 6 | SP**1203... |
| CSKPR/L16CA | 55 | 0.8 | 25 | 63 | 22 | 16 | 16 | 17 | 25 | 8 | 5 | 0 | 0 | SP**1203... |

Note: • In above table, øDm1 is min. bore dia. for axial mounting and øDm2 is for radial mounting.
• When using a right or left hand insert, the right hand insert is used for left hand cartridge and the left hand insert is used for right hand cartridge.
• The left hand insert is used for the right hand cartridge and right hand insert is used for left hand cartridge.
• **rε: Standard corner radius

### SPARE PARTS

| Designation | Shim | Lever | Clamping screw | Axial adjusting screw | Radial adjusting screw | Cartridge setting screw | Wrench | Chipbreaker piece | Shim retainer (1) | Sizing plate ass'y (1) |
|---|---|---|---|---|---|---|---|---|---|---|
| CSKPR/L10CA-09 | - | - | CSG-5 (CSG-5S) | ASM54 | SSHM4-10 | CHHM6-15 | P-2,P-2.5,P-5 | CBS-3M | - | PSTR/L10 |
| CSKPR/L12CA-12 | - | - | CSG-6 (CSG-6S) | ASM54 | SSHM4-14 | CHHM6-25 | P-2,P-3,P-5 | CBS-4M | - | PSTR/L12 |
| CSKPR/L16CA | PAS-42 | SM3X0.5X8 | CSG-8S | ASM6 | SSHM5-16 | BHM8-25U | P-2.5,P-4 | - | * | - |

(1) Optional

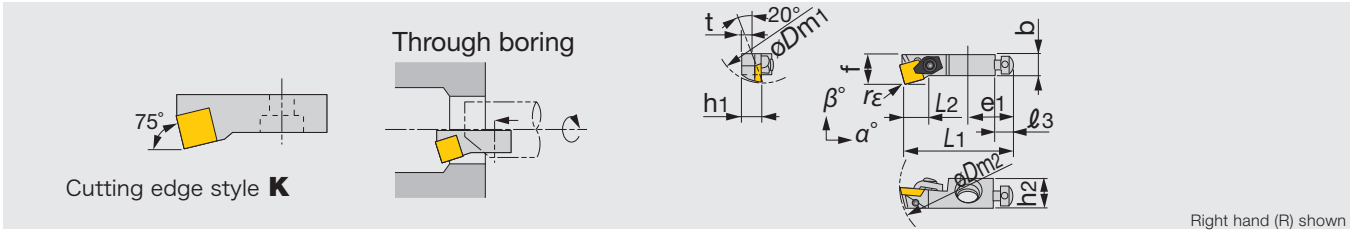
Tooling System

Inserts for PN PSKN-CA → **B070 -,** CBN → **B164 -,** PCD → **B176**

Inserts for CP CSKP-CA → **B123 -,** CBN → **B168 -,** PCD → **B177**

## CE CSKE-CA

Clamp on cartridge with 75° approach angle for 20° clearance square insert




Right hand (R) shown

| Designation | øDm1 | øDm2 | rε** | f | L1 | L2 | h1 | h2 | b | e1 | ℓ3 | β° | α° | t | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CSKER10CA-09 | 40 | 55 | 0.8 | 14 | 50 | 11.3 | 10 | 14.5 | 10 | 20 | 8 | 10 | 5 | 8 | SE**0903... |

Note: • In above table, øDm1 is min. bore dia. for axial mounting and øDm2 is for radial mounting.
• When using a right or left hand insert, the right hand insert is used for left hand cartridge and the left hand insert is used for right hand cartridge.
• The left hand insert is used for the right hand cartridge and right hand insert is used for left hand cartridge.
• **rε: Standard corner radius

### SPARE PARTS

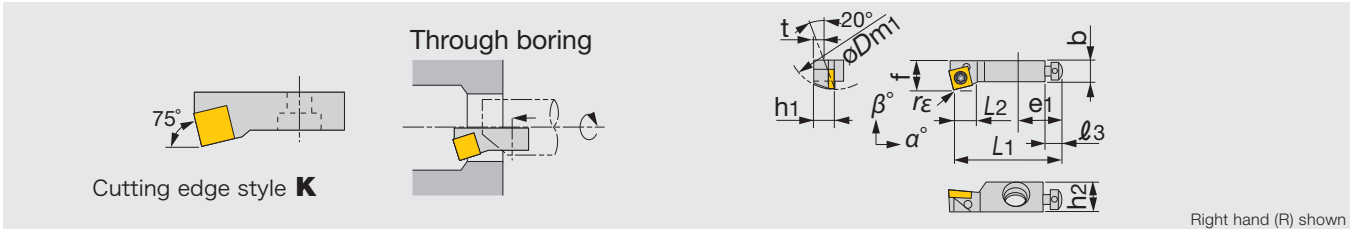
| Designation | Cartridge setting screw | Wrench | Wrench 1 | Wrench 2 |
|---|---|---|---|---|
| CSKER10CA-09 | CHHM6-15 | P-2 | P-2.5 | P-5 |

| Designation | Clamp set | Axial adjusting screw | Radial adjusting screw | Chipbreaker piece | Sizing plate ass'y (1) |
|---|---|---|---|---|---|
| CSKER10CA-09 | CSW-40 | ASM54 | SSHM4-8 | CBS-3M | PSTR/L10 |

(1) Optional

## SP SSKP-CA

Screw on cartridge with 75° approach angle for 11° clearance square insert




Right hand (R) shown

| Designation | øDm1 | rε** | f | L1 | L2 | h1 | h2 | b | e1 | ℓ3 | β° | α° | t | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SSKPR10CA-09 | 40 | 0.8 | 14 | 50 | 12.7 | 10 | 14.5 | 10 | 20 | 8 | 5 | 0 | 8 | SP**0903... |
| SSKPR12CA-12 | 50 | 0.8 | 20 | 55 | 16 | 12 | 19.5 | 15 | 20 | 8 | 5 | 2 | 8 | SP**1204... |

Note: • In above table, øDm1 is min. bore dia. for axial mounting and øDm2 is for radial mounting.
• When using a right or left hand insert, the right hand insert is used for left hand cartridge and the left hand insert is used for right hand cartridge.
• The left hand insert is used for the right hand cartridge and right hand insert is used for left hand cartridge.
• **rε: Standard corner radius

### SPARE PARTS

| Designation | Clamping screw | Cartridge setting screw | Wrench | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|
| SSKPR10CA-09 | CSTB-4S | CHHM6-15 | P-2 | T-15F | P-5 |
| SSKPR12CA-12 | CSTB-5S | CHHM6-25 | P-2 | T-20F | P-5 |

| Designation | Axial adjusting screw | Radial adjusting screw | Sizing plate ass'y (1) |
|---|---|---|---|
| SSKPR10CA-09 | ASM54 | SSHM4-10 | PSTR/L10 |
| SSKPR12CA-12 | ASM54 | SSHM4-14 | PSTR/L12 |

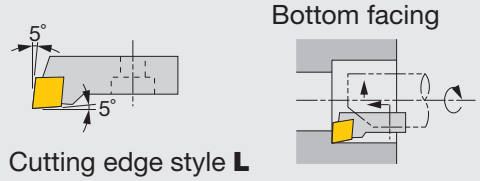
(1) Optional

Inserts for CE CSKE-CA → **Special**

Inserts for SP SSKP-CA → **B123 -,** CBN → **B168**

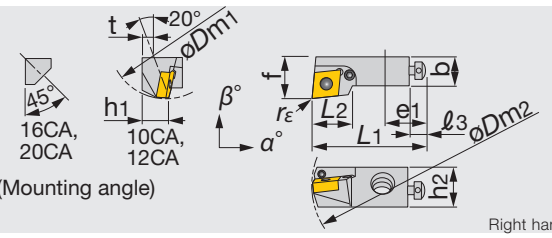
## PN PCLN-CA

Lever lock cartridge with 95° approach angle for negative rhombic insert




Cutting edge style **L**




(Mounting angle)

Right hand (R) shown.

| Designation | øDm1 | øDm2 | rε** | f | L1 | L2 | h1 | h2 | b | e1 | ℓ3 | β° | α° | t | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PCLNR/L12CA-12 | 50 | 75 | 0.8 | 20 | 55 | 19 | 12 | 19.5 | 15 | 20 | 8 | -6 | -8 | 6 | CN**1204... |
| PCLNR/L16CA | 55 | 75 | 0.8 | 25 | 63 | 28 | 16 | 16 | 17 | 25 | 8 | -6 | -8 | 0 | CN**1204... |
| PCLNR/L20CA | 70 | 90 | 1.2 | 25 | 70 | 31 | 20 | 20 | 19 | 30 | 10 | -6 | -8 | 0 | CN**1606... |

Note: • In above table, øDm1 is min. bore dia. for axial mounting and øDm2 is for radial mounting.
• When using a right or left hand insert, the right hand insert is used for left hand cartridge and the left hand insert is used for right hand cartridge.
• The left hand insert is used for the right hand cartridge and right hand insert is used for left hand cartridge.
• **rε: Standard corner radius

### SPARE PARTS

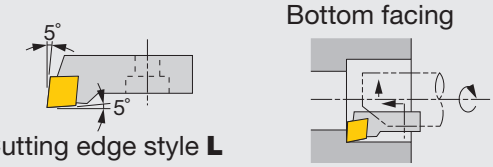
| Designation | Cartridge setting screw | Cartridge setting screw 1 | Sizing plate | Sizing plate 1 | Wrench | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|---|
| PCLNR/L12CA-12 | - | CHHM6-25 | - | - | P-2 | P-2.5 | P-5 |
| PCLNR/L16CA | BHM8-25U | - | S0816B | S1016B | P-2.5 | P-3 | P-5 |
| PCLNR/L20CA | - | - | - | - | P-2.5 | P-3 | P-5 |

| Designation | Shim | Lever | Clamping screw | Axial adjusting screw | Radial adjusting screw | Shim retainer | Sizing plate ass'y (1) |
|---|---|---|---|---|---|---|---|
| PCLNR/L12CA-12 | - | LCL43N | LCS43 | ASM54 | SSHM4-4 | - | PSTR/L12 |
| PCLNR/L16CA | LSC 42CA | LCL4 | LCS4CA | ASM6 | SSHM5-6 | LSP4 | - |
| PCLNR/L20CA | LSC 53CA | LCL5 | LCS5CA | ASM6 | SSHM5-6 | LSP5 | - |

(1) Optional

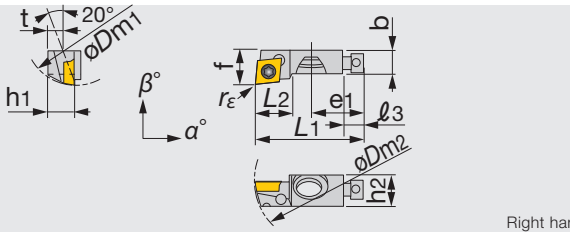
## SP SCLP-CA

Screw on cartridge with 95° approach angle for 11° clearance rhombic insert




Cutting edge style **L**




Right hand (R) shown.

| Designation | øDm1 | øDm2 | rε** | f | L1 | L2 | h1 | h2 | b | e1 | ℓ3 | β° | α° | t | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SCLPR/L06CA-05 | 20 | 30 | 0.4 | 8 | 25 | 8.5 | 6 | 7.5 | 5.5 | 12 | 4.5 | 0 | 0 | 3.5 | CP**0502... |

Note: • In above table, øDm1 is min. bore dia. for axial mounting and øDm2 is for radial mounting.
• When using a right or left hand insert, the right hand insert is used for left hand cartridge and the left hand insert is used for right hand cartridge.
• The left hand insert is used for the right hand cartridge and right hand insert is used for left hand cartridge.
• **rε: Standard corner radius

### SPARE PARTS

| Designation | Clamping screw | Cartridge setting screw | Wrench | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|
| SCLPR/L06CA-05 | CSTB-2.2S | CHHM3.5-10 | P-1.5 | T-7F | P-3 |

| Designation | Axial adjusting screw | Radial adjusting screw | Sizing plate ass'y (1) |
|---|---|---|---|
| SCLPR/L06CA-05 | ASM34S | SSHM3-6 | PT06 |

(1) Optional

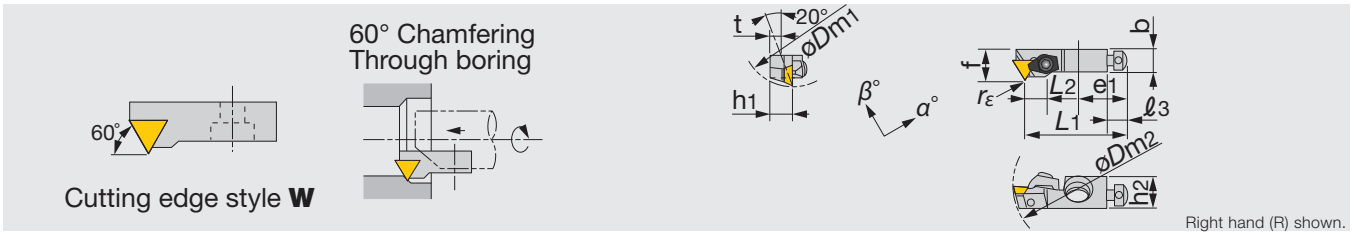
Inserts for PN PCLN-CA → **B050 -,** CBN → **B163 -,** PCD → **B176**

Inserts for SP SCLP-CA → **B112**

Tooling System

## CP CTWP-CA

Clamp on cartridge with 60° approach angle for 11° clearance triangle insert




Right hand (R) shown.

| Designation | øDm1 | øDm2 | rε** | f | L1 | L2 | h1 | h2 | b | e1 | ℓ3 | β° | α° | t | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CTWPR10CA-11 | 40 | 55 | 0.4 | 14 | 44 | 13 | 10 | 14.5 | 10 | 20 | 8 | 4 | 0 | 5 | TP**1103... |
| CTWPR/L12CA-16 | 50 | 75 | 0.8 | 20 | 47 | 11 | 12 | 19.5 | 15 | 20 | 8 | 4 | 0 | 6 | TP**1603... |

Note: • In above table, øDm1 is min. bore dia. for axial mounting and øDm2 is for radial mounting.
• Hand of the insert to be used should be selected depending on the application.
• **rε: Standard corner radius

### SPARE PARTS

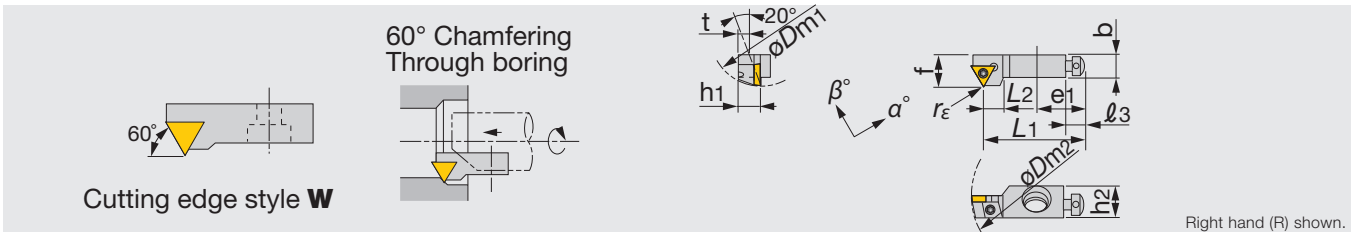
| Designation | Cartridge setting screw | Wrench | Wrench 1 | Wrench 2 |
|---|---|---|---|---|
| CTWPR10CA-11 | CHHM6-15 | P-2 | P-2.5 | P-5 |
| CTWPR/L12CA-16 | CHHM6-25 | P-2 | P-3 | P-5 |

| Designation | Clamping screw | Axial adjusting screw | Radial adjusting screw | Chipbreaker piece | Sizing plate ass'y |
|---|---|---|---|---|---|
| CTWPR/L10CA-11 | CSG-5 (CSG-5S) | ASM54 | SSHM4-10 | CBT-2M | PSTR/L10 |
| CTWPR/L12CA-16 | CSG-6 (CSG-6S) | ASM54 | SSHM4-14 | CBT-3M | PSTR/L12 |

Notes : • Cartridges of K-style cutting edge uses S0816A or S1016A,whilst ones of S-style uses S0816C or S1016B (*marked).
• When not using Chipbreaker piece, clamping screw in ( ) should be used.
• Hand of the insert should be selected according to the application.

## SP STWP-CA

Screw on cartridge with 60° approach angle for 11° clearance triangle insert




Right hand (R) shown.

| Designation | øDm1 | rε** | f | L1 | L2 | h1 | h2 | b | e1 | ℓ3 | β° | α° | t | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| STWPR08CA-09 | 25 | 0.4 | 10 | 28 | 6 | 8 | 11.5 | 7.5 | 17 | 6 | 4 | 0 | 6 | TP**0902... |
| STWPR/L10CA-11 | 40 | 0.4 | 14 | 44 | 9 | 10 | 14.5 | 10 | 20 | 8 | 4 | 0 | 8 | TP**1102... |
| STWPR12CA-16 | 50 | 0.8 | 20 | 47 | 9 | 12 | 19.5 | 15 | 20 | 8 | 4 | 0 | 8 | TP**16T3... |

Note: • In above table, øDm1 is min. bore dia. for axial mounting and øDm2 is for radial mounting.
• Hand of the insert to be used should be selected depending on the application.
• **rε: Standard corner radius

### SPARE PARTS

| Designation | Clamping screw | Cartridge setting screw | Wrench | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|
| STWPR08CA-09 | CSTB-2.2S | CHHM4-10 | P-1.5 | T-7F | P-3 |
| STWPR/L10CA-11 | CSTB-2.5 | CHHM6-15 | P-2 | T-8F | P-5 |
| STWPR12CA-16 | CSTB-4S | CHHM6-25 | P-2 | T-15F | P-5 |

| Designation | Axial adjusting screw | Radial adjusting screw | Sizing plate ass'y (1) |
|---|---|---|---|
| STWPR08CA-09 | ASM34L | SSHM3-6 | PSTR/L08 |
| STWPR/L10CA-11 | ASM54 | SSHM4-10 | PSTR/L10 |
| STWPR12CA-16 | ASM54 | SSHM4-14 | PSTR/L12 |

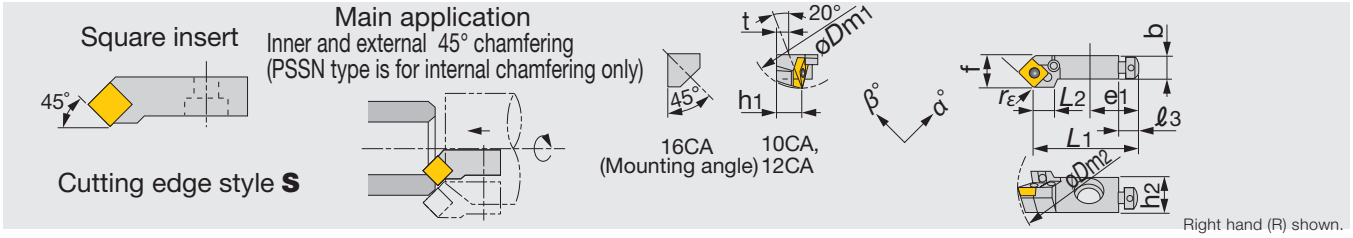
(1) Optional

Inserts for CP CTWP-CA → **B131 -,** CBN → **B168 -,** PCD → **B178**

Inserts for SP STWP-CA → **B131 -,** CBN → **B168 -,** PCD → **B178**

## PN PSSN-CA

Lever lock cartridge with 45° approach angle for negative square insert




Right hand (R) shown.

| Designation | øDm1 | øDm2 | rε** | f | L1 | L2 | h1 | h2 | b | e1 | ℓ3 | β° | α° | t | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PSSNR/L10CA-09 | 40 | 55 | 0.8 | 14 | 44 | 10 | 10 | 14.5 | 10 | 20 | 8 | -12 | 0 | 5 | SN**0903... |
| PSSNR/L12CA-12 | 50 | 75 | 0.8 | 20 | 47 | 12 | 12 | 19.5 | 15 | 20 | 8 | -12 | 0 | 6 | SN**1204... |
| PSSNR/L16CA | 55 | 75 | 0.8 | 25 | 53 | 28 | 16 | 16 | 17 | 25 | 8 | -11 | 0 | 0 | SN**1204... |

Note: • In above table, øDm1 is min. bore dia. for axial mounting and øDm2 is for radial mounting.
• Hand of the insert to be used should be selected depending on the application.
• **rε: Standard corner radius

### SPARE PARTS

| Designation | Cartridge setting screw | Cartridge setting screw 1 | Wrench | Wrench 1 | Wrench 2 | Radial adjusting screw |
|---|---|---|---|---|---|---|
| PSSNR/L10CA-09 | - | CHHM4-4 | P-5 | P-2F | - | SSHM4-4 |
| PSSNR/L12CA-12 | - | CHHM6-25 | P-2 | P-2.5 | P-5 | SSHM4-4 |
| PSSNR/L16CA | BHM8-25U | CHHM6-25 | P-2.5 | P-3 | P-5 | SSHM5-6 |

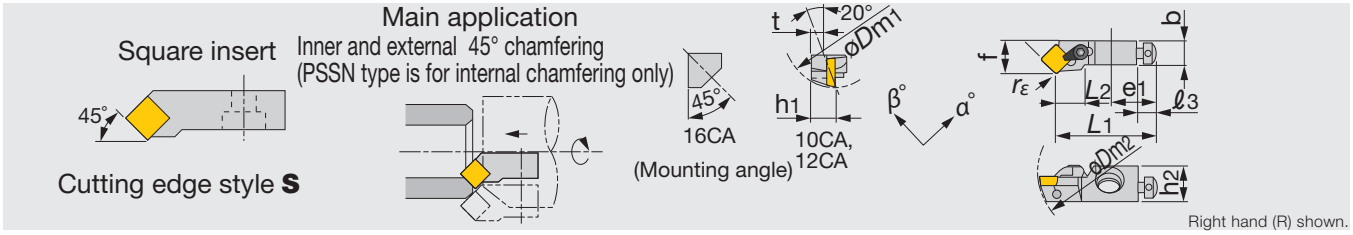
| Designation | Shim | Lever | Clamping screw | Axial adjusting screw | Shim retainer | Sizing plate (1) | Sizing plate ass'y (1) |
|---|---|---|---|---|---|---|---|
| PSSNR/L10CA-09 | - | LCL32N | LCS22 | ASM54 | - | - | PSTR/L10 |
| PSSNR/L12CA-12 | - | LCL43N | LCS43 | ASM54 | - | - | PSTR/L12 |
| PSSNR/L16CA | LSS42CA | LCL4 | LCS4CA | ASM6 | LSP4 | S0816B/S1016B | - |

Notes : Cartridges of K-style cutting edge uses S0816A or S1016A,whilst ones of S-style uses S0816C or S1016B (*marked).

(1) Optional

## CP CSSP-CA

Clamp on cartridge with 45° approach angle for 11° clearance square insert




Right hand (R) shown.

| Designation | øDm1 | øDm2 | rε** | f | L1 | L2 | h1 | h2 | b | e1 | ℓ3 | β° | α° | t | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CSSPR/L10CA-09 | 40 | 55 | 0.8 | 14 | 44 | 11 | 10 | 14.5 | 10 | 20 | 8 | 3 | 0 | 5 | SP**0903... |
| CSSPR/L12CA-12 | 50 | 75 | 0.8 | 20 | 47 | 13 | 12 | 19.5 | 15 | 20 | 8 | 4 | 0 | 6 | SP**1203... |
| CSSPR16CA | 55 | 75 | 0.8 | 25 | 53 | 15 | 16 | 16 | 17 | 25 | 8 | 0 | 0 | 0 | SP**1203... |

Note: • In above table, øDm1 is min. bore dia. for axial mounting and øDm2 is for radial mounting.
• Hand of the insert to be used should be selected depending on the application.
• **rε: Standard corner radius

### SPARE PARTS

| Designation | Cartridge setting screw | Cartridge setting screw 1 | Wrench | Wrench 1 | Wrench 2 | Radial adjusting screw |
|---|---|---|---|---|---|---|
| CSSPR/L10CA-09 | - | CHHM6-15 | P-2 | P-2.5 | P-5 | SSHM4-10 |
| CSSPR/L12CA-12 | - | CHHM6-25 | P-2 | P-3 | P-5 | SSHM4-14 |
| CSSPR16CA | BHM8-25U | | P-2.5 | P-4 | - | SSHM5-16 |

| Designation | Shim | Lever | Clamping screw | Axial adjusting screw | Radial adjusting screw | Chipbreaker piece | Sizing plate ass'y (1) |
|---|---|---|---|---|---|---|---|
| CSSPR/L10CA-09 | - | - | CSG-5 (CSG-5S) | ASM54 | SSHM4-10 | CBS-3M | PSTR/L10 |
| CSSPR/L12CA-12 | - | - | CSG-6 (CSG-6S) | ASM54 | SSHM4-14 | CBS-4M | PSTR/L12 |
| CSSPR16CA | PAS-42 | SM3X0.5X8 | CSG-8S | ASM6 | SSHM5-16 | - | - |

Notes : Cartridges of K-style cutting edge uses S0816A or S1016A,whilst ones of S-style uses S0816C or S1016B (*marked).
When not using Chipbreaker piece, clamping screw in ( ) should be used.

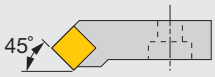
(1) Optional

Tooling System

## CE CSSE-CA

Clamp on cartridge with 45° approach angle for 20° clearance square insert

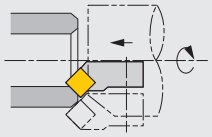
Square insert

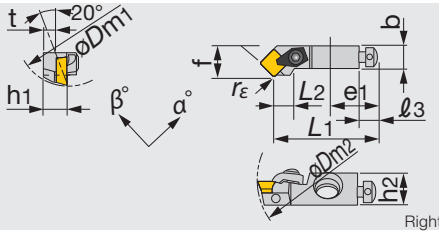



Cutting edge style **S**

Main application

Inner and external 45° chamfering
(PSSN type is for internal chamfering only)






Right hand (R) shown.

| Designation | øDm1 | øDm2 | rε** | f | L1 | L2 | h1 | h2 | b | e1 | ℓ3 | β° | α° | t | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CSSER12CA-12 | 50 | 75 | 0.8 | 20 | 47 | 12 | 12 | 19.5 | 15 | 20 | 8 | 10 | 0 | 6 | SE**1203... |

Note: • In above table, øDm1 is min. bore dia. for axial mounting and øDm2 is for radial mounting.
• Hand of the insert to be used should be selected depending on the application.
• **rε: Standard corner radius

### SPARE PARTS






| Designation | Cartridge setting screw | Wrench | Wrench 1 | Wrench 2 |
|---|---|---|---|---|
| CSSER12CA-12 | CHHM6-25 | P-2 | P-3 | P-5 |






(1)

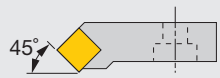
| Designation | Clamping screw | Axial adjusting screw | Radial adjusting screw | Chipbreaker piece | Sizing plate ass'y |
|---|---|---|---|---|---|
| CSSER12CA-12 | CSW-50 | ASM54 | SSHM4-14 | CBS-4M | PSTR/L12 |

(1) Optional

## SP SSSP-CA

Screw on cartridge with 45° approach angle for 11° clearance square insert

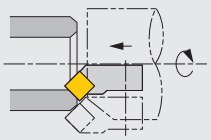
Square insert

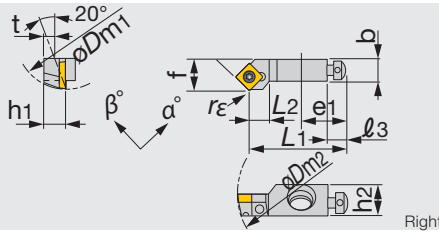



Cutting edge style **S**

Main application

Inner and external 45° chamfering
(PSSN type is for internal chamfering only)






Right hand (R) shown.

| Designation | øDm1 | øDm2 | rε** | f | L1 | L2 | h1 | h2 | b | e1 | ℓ3 | β° | α° | t | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SSSPR/L10CA-09 | 40 | 55 | 0.8 | 14 | 44 | 9 | 10 | 14.5 | 10 | 20 | 8 | 3 | 0 | 8 | SP**0903... |
| SSSPR/L12CA-12 | 50 | 75 | 0.8 | 20 | 47 | 13 | 12 | 19.5 | 15 | 20 | 8 | 4 | 0 | 8 | SP**1204... |

Note: • In above table, øDm1 is min. bore dia. for axial mounting and øDm2 is for radial mounting.
• Hand of the insert to be used should be selected depending on the application.
• **rε: Standard corner radius

### SPARE PARTS







| Designation | Clamping screw | Cartridge setting screw | Wrench | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|
| SSSPR/L10CA-09 | CSTB-4S | CHHM6-15 | P-2 | T-15F | P-5 |
| SSSPR/L12CA-12 | CSTB-5S | CHHM6-25 | P-2 | T-20F | P-5 |




(1)

| Designation | Axial adjusting screw | Radial adjusting screw | Sizing plate ass'y |
|---|---|---|---|
| SSSPR/L10CA-09 | ASM54 | SSHM4-10 | PSTR/L10 |
| SSSPR/L12CA-12 | ASM54 | SSHM4-14 | PSTR/L12 |

(1) Optional


Inserts for PN PSSN-CA → **B070 -,** CBN → **B164 -,** PCD → **B176**

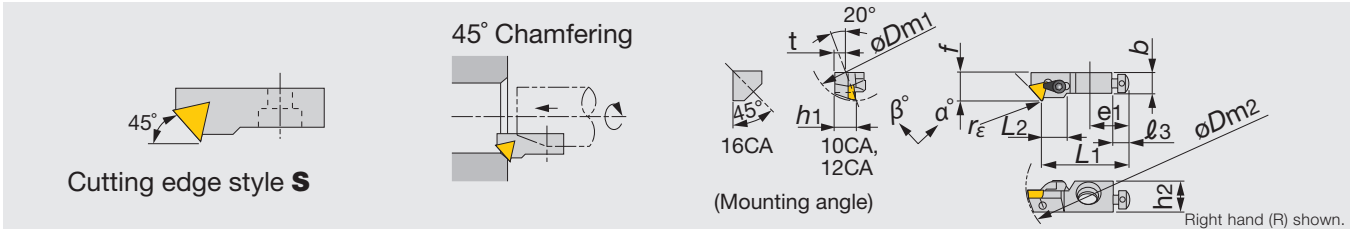
Inserts for CP CSSP-CA → **B123 -,** CBN → **B168 -,** PCD → **B177**

Inserts for CE CSSE-CA → **Special**

Inserts for SP SSSP-CA → **B123 -,** CBN → **B170,** PCD → **B177**

## CP CTSP-CA

### Clamp on cartridge with 45° approach angle for 11° clearance triangle insert




| Designation | øDm1 | øDm2 | rε** | f | L1 | L2 | h1 | h2 | b | e1 | ℓ3 | β° | α° | t | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CTSPR/L10CA-11 | 40 | 55 | 0.4 | 14 | 44 | 12 | 10 | 14.5 | 10 | 20 | 8 | 3 | 0 | 5 | TP**1103... |
| CTSPR/L12CA-16 | 50 | 75 | 0.8 | 20 | 47 | 11 | 12 | 19.5 | 15 | 20 | 8 | 4 | 0 | 6 | TP**1603... |

Note: • In above table, øDm1 is min. bore dia. for axial mounting and øDm2 is for radial mounting.
• When using a right or left hand insert, the right hand insert is used for left hand cartridge and the left hand insert is used for right hand cartridge.
• The left hand insert is used for the right hand cartridge and right hand insert is used for left hand cartridge.
• **rε: Standard corner radius

### SPARE PARTS

| Designation | Cartridge setting screw | Wrench | Wrench 1 | Wrench 2 |
|---|---|---|---|---|
| CTSPR/L10CA-11 | CHHM6-15 | P-2 | P-2.5 | P-5 |
| CTSPR/L12CA-16 | CHHM6-25 | P-2 | P-3 | P-5 |

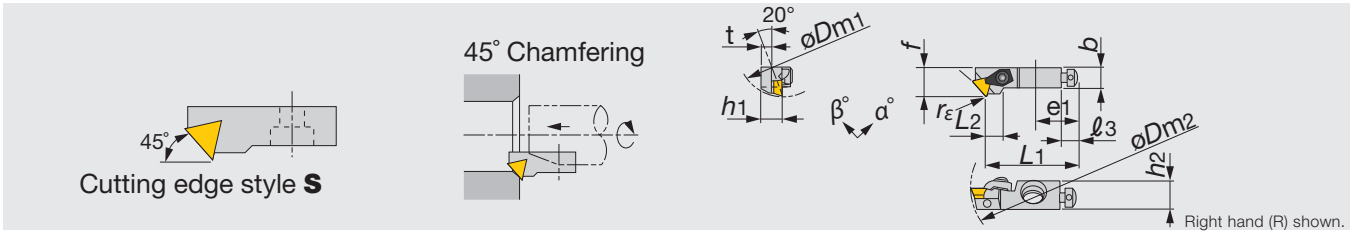
| Designation | Clamping screw | Axial adjusting screw | Radial adjusting screw | Chipbreaker piece | Sizing plate ass'y (1) |
|---|---|---|---|---|---|
| CTSPR/L10CA-11 | CSG-5 (CSG-5S) | ASM54 | SSHM4-10 | CBT-2M | PSTR/L10 |
| CTSPR/L12CA-16 | CSG-6 (CSG-6S) | ASM54 | SSHM4-14 | CBT-3M | PSTR/L12 |

(1) Optional

Notes : Cartridges of K-style cutting edge uses S0816A or S1016A,whilst ones of S-style uses S0816C or S1016B (*marked). When not using Chipbreaker piece, clamping screw in ( ) should be used.

## CE CTSE-CA

### Clamp on cartridge with 45° approach angle for 20° clearance triangle insert




| Designation | øDm1 | øDm2 | rε** | f | L1 | L2 | h1 | h2 | b | e1 | ℓ3 | β° | α° | t | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CTSER10CA-11 | 40 | 55 | 0.4 | 14 | 44 | 8 | 10 | 14.5 | 10 | 20 | 8 | 10 | 0 | 5 | TE**1103... |

Note: • In above table, øDm1 is min. bore dia. for axial mounting and øDm2 is for radial mounting.
• When using a right or left hand insert, the right hand insert is used for left hand cartridge and the left hand insert is used for right hand cartridge.
• The left hand insert is used for the right hand cartridge and right hand insert is used for left hand cartridge.
• **rε: Standard corner radius

### SPARE PARTS

| Designation | Cartridge setting screw | Wrench | Wrench 1 | Wrench 2 |
|---|---|---|---|---|
| CTSER10CA-11 | CHHM6-15 | P-2 | P-2.5 | P-5 |

| Designation | Clamp set | Axial adjusting screw | Radial adjusting screw | Chipbreaker piece | Sizing plate ass'y (1) |
|---|---|---|---|---|---|
| CTSER10CA-11 | CSW-40 | ASM54 | SSHM4-8 | CBT-2M | PSTR/L10 |

(1) Optional

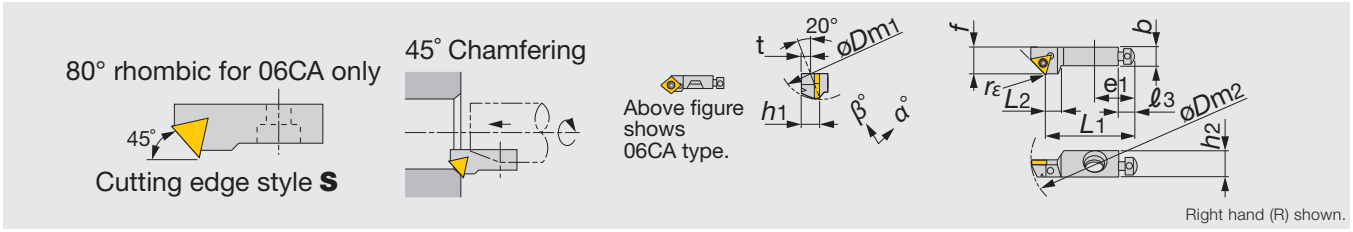


Inserts for CP CTSP-CA → **B131 -**, CBN → **B168 -**, PCD → **B178**

Inserts for CE CTSE-CA → **Special**

## SP STSP-CA / SCSP-CA

Screw on cartridge with 45° approach angle for 11° clearance triangle insert / rhombic insert




Right hand (R) shown.

| Designation | øDm1 | øDm2 | rε** | f | L1 | L2 | h1 | h2 | b | e1 | ℓ3 | β° | α° | t | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SCSPR/L06CA-05 | 20 | 30 | 0.4 | 8 | 22 | 6 | 6 | 7.5 | 5.5 | 12 | 4.5 | 0 | 0 | 3.5 | CP**0502... |
| STSPR/L08CA-09 | 25 | 35 | 0.4 | 10 | 28 | 5.2 | 8 | 11.5 | 7.5 | 17 | 6 | 0 | 0 | 4.5 | TP**0902... |
| STSPR/L10CA-11 | 40 | 55 | 0.4 | 14 | 44 | 9 | 10 | 14.5 | 10 | 20 | 8 | 3 | 0 | 5 | TP**1102... |
| STSPR/L12CA-16 | 50 | 75 | 0.8 | 20 | 47 | 11 | 12 | 19.5 | 15 | 20 | 8 | 4 | 0 | 6 | TP**16T3... |

Note: • In above table, øDm1 is min. bore dia. for axial mounting and øDm2 is for radial mounting.
• When using a right or left hand insert, the right hand insert is used for left hand cartridge and the left hand insert is used for right hand cartridge.
• The left hand insert is used for the right hand cartridge and right hand insert is used for left hand cartridge.
• **rε: Standard corner radius

### SPARE PARTS

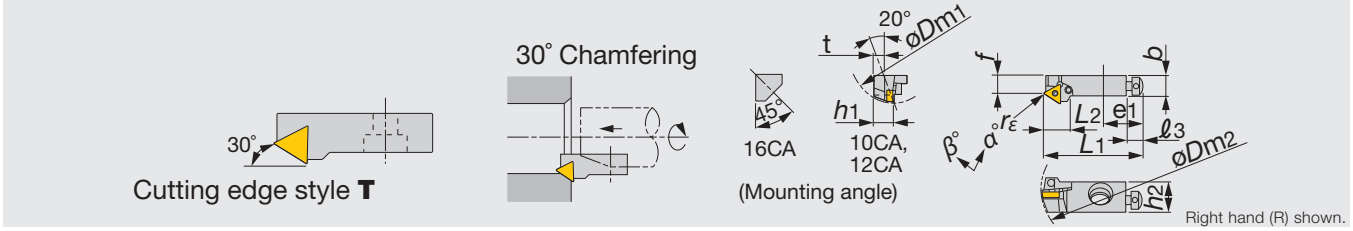
| Designation | Clamping screw | Cartridge setting screw | Wrench | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|
| SCSPR/L06CA-05 | CSTB-2.2S | CHHM3.5-10 | P-1.5 | T-7F | P-3 |
| STSPR/L08CA-09 | CSTB-2.2S | CHHM4-10 | P-1.5 | T-7F | P-3 |
| STSPR/L10CA-11 | CSTB-2.5 | CHHM6-15 | P-2 | T-8F | P-5 |
| STSPR/L12CA-16 | CSTB-4S | CHHM6-25 | P-2 | T-15F | P-5 |

| Designation | Axial adjusting screw | Radial adjusting screw | Sizing plate ass'y (1) |
|---|---|---|---|
| SCSPR/L06CA-05 | ASM34S | SSHM3-6 | PT06 |
| STSPR/L08CA-09 | ASM34L | SSHM3-6 | PSTR/L08 |
| STSPR/L10CA-11 | ASM54 | SSHM4-10 | PSTR/L10 |
| STSPR/L12CA-16 | ASM54 | SSHM4-14 | PSTR/L12 |

(1) Optional

## PN PTTN-CA

Lever lock cartridge with 30° approach angle for negative triangule insert




Right hand (R) shown.

| Designation | øDm1 | øDm2 | rε** | f | L1 | L2 | h1 | h2 | b | e1 | ℓ3 | β° | α° | t | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PTTNR/L10CA-11 | 40 | 55 | 0.4 | 9 | 50 | 13 | 10 | 14.5 | 10 | 20 | 8 | -10 | 0 | 5 | TN**1103... |
| PTTNR/L12CA-16 | 50 | 75 | 0.8 | 13 | 55 | 19 | 12 | 19.5 | 15 | 20 | 8 | -10 | 0 | 6 | TN**1604... |
| PTTNR/L16CA | 60 | 75 | 0.8 | 15 | 63 | 22 | 16 | 16 | 17 | 25 | 8 | -10 | -2 | 0 | TN**1604... |

Note: • In above table, øDm1 is min. bore dia. for axial mounting and øDm2 is for radial mounting.
• When using a right or left hand insert, the right hand insert is used for left hand cartridge and the left hand insert is used for right hand cartridge.
• The left hand insert is used for the right hand cartridge and right hand insert is used for left hand cartridge.
• **rε: Standard corner radius

### SPARE PARTS

| Designation | Cartridge setting screw | Sizing plate | Sizing plate 1 | Wrench | Wrench 1 |
|---|---|---|---|---|---|
| PTTNR/L10CA-11 | CHHM6-15 | - | - | P-5 | P-2F |
| PTTNR/L12CA-16 | CHHM6-25 | - | - | P-5 | P-2F |
| PTTNR/L16CA | BHM8-25U | S0816B | S1016B | P-2.5 | P-5 |

| Designation | Shim | Lever | Clamping screw | Axial adjusting screw | Radial adjusting screw | Shim retainer | Sizing plate ass'y (1) |
|---|---|---|---|---|---|---|---|
| PTTNR/L10CA-11 | - | LCL22N | LCS22 | ASM54 | SSHM4-4 | - | PSTR/L10 |
| PTTNR/L12CA-16 | - | LCL33N | LCS33 | ASM54 | SSHM4-4 | - | PSTR/L12 |
| PTTNR/L16CA | LST317CA | LCL3 | LCS3 | ASM6 | SSHM5-6 | LSP3 | - |

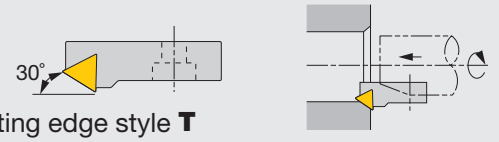
(1) Optional

Inserts for SP STSP-CA → **B112** (CP**), **B131 -** (TP**), CBN → **B168 -**, PCD → **B178**

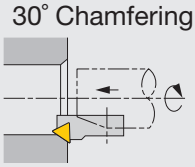
Inserts for PN PTTN-CA → **B079 -**, CBN → **B164 -**, PCD → **B176**

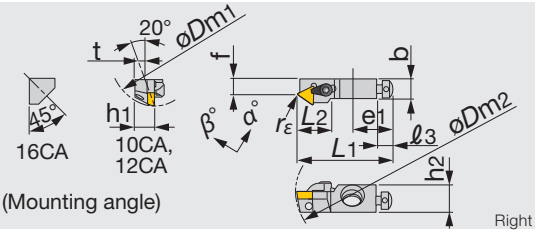
## CP CTTP-CA

Clamp on cartridge with 30° approach angle for 11° clearance triangle insert




Cutting edge style **T**




(Mounting angle)

Right hand (R) shown.

| Designation | øDm1 | øDm2 | rε** | f | L1 | L2 | h1 | h2 | b | e1 | ℓ3 | β° | α° | t | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CTTPR/L10CA-11 | 40 | 55 | 0.4 | 9 | 50 | 18 | 10 | 14.5 | 10 | 20 | 8 | 0 | 0 | 5 | TP**1103... |
| CTTPR12CA-16 | 50 | 75 | 0.8 | 13 | 55 | 22 | 12 | 19.5 | 15 | 20 | 8 | 4 | 0 | 6 | TP**1603... |
| CTTPL16CA | 55 | 75 | 0.8 | 15 | 63 | 23 | 16 | 16 | 17 | 25 | 8 | 0 | 0 | 0 | TP**1603... |

Note: • In above table, øDm1 is min. bore dia. for axial mounting and øDm2 is for radial mounting.
• When using a right or left hand insert, the right hand insert is used for left hand cartridge and the left hand insert is used for right hand cartridge.
• The left hand insert is used for the right hand cartridge and right hand insert is used for left hand cartridge.
• **rε: Standard corner radius

### SPARE PARTS

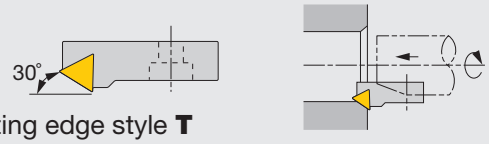
| Designation | Cartridge setting screw | Sizing plate | Sizing plate 1 | Wrench | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|
| CTTPL10CA-11 | CHHM6-15 | - | - | P-2 | P-2.5 | P-5 |
| CTTPR/L12CA-16 | CHHM6-25 | - | - | P-2 | P-3 | P-5 |
| CTTPL16CA | BHM8-25U | S0816B | S1016B | P-2.5 | P-4 | - |

| Designation | Shim | Lever | Clamping screw | Axial adjusting screw | Radial adjusting screw | Sizing plate ass'y (1) | Chipbreaker piece |
|---|---|---|---|---|---|---|---|
| CTTPR/L10CA-11 | - | - | CSG-5 (CSG-5S) | ASM54 | SSHM4-10 | PSTR/L10 | CBT-2M |
| CTTPR12-16 | - | - | CSG-6 (CSG-6S) | ASM54 | SSHM4-14 | PSTR12 | CBT-3M |
| CTTPL10CA | PAT-32 | SM3X0.5X8 | CSG-8S | ASM6 | SSHM5-16 | - | - |

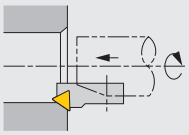
(1) Optional

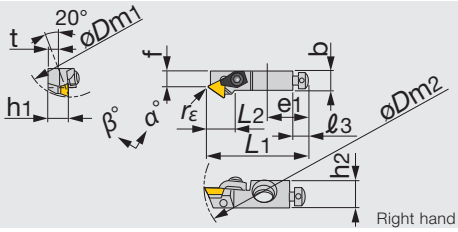
## CE CTTE-CA

Clamp on cartridge with 30° approach angle for 20° clearance triangle insert




Cutting edge style **T**




Right hand (R) shown.

| Designation | øDm1 | øDm2 | rε** | f | L1 | L2 | h1 | h2 | b | e1 | ℓ3 | β° | α° | t | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CTTER10CA-11 | 40 | 55 | 0.4 | 9 | 50 | 14 | 10 | 14.5 | 10 | 20 | 8 | 10 | 0 | 5 | TE**1103... |
| CTTER12CA-16 | 50 | 75 | 0.8 | 13 | 55 | 18 | 12 | 19.5 | 15 | 20 | 8 | 10 | 0 | 6 | TE**1603... |

Note: • In above table, øDm1 is min. bore dia. for axial mounting and øDm2 is for radial mounting.
• When using a right or left hand insert, the right hand insert is used for left hand cartridge and the left hand insert is used for right hand cartridge.
• The left hand insert is used for the right hand cartridge and right hand insert is used for left hand cartridge.
• **rε: Standard corner radius

### SPARE PARTS

| Designation | Cartridge setting screw | Wrench | Wrench 1 | Wrench 2 |
|---|---|---|---|---|
| CTTER10CA-11 | CHHM6-15 | P-2 | P-2.5 | P-5 |
| CTTER12CA-16 | CHHM6-25 | P-2 | P-3 | P-5 |

| Designation | Clamp set | Axial adjusting screw | Radial adjusting screw | Chipbreaker piece | Sizing plate ass'y (1) |
|---|---|---|---|---|---|
| CTTER10CA-11 | CSW-40 | ASM54 | SSHM4-8 | CBT-2M | PSTR10 |
| CTTER12CA-16 | CSW-50 | ASM54 | SSHM4-14 | CBT-3M | PSTR12 |

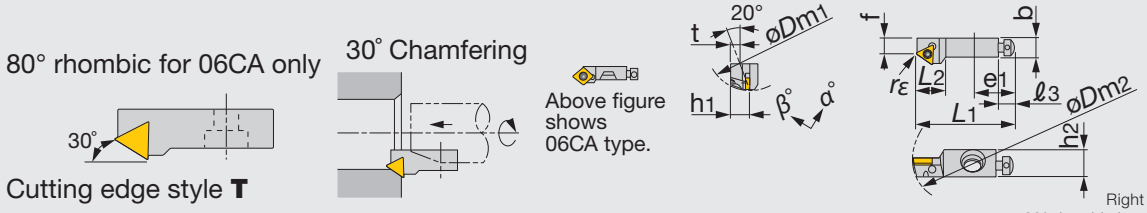
(1) Optional

Inserts for CP CTTP-CA → **B131 -**, CBN → **B168 -**, PCD → **B178**

Inserts for CE CTTE-CA → **Special**

## SP STTP-CA / SCTP-CA

Screw on cartridge with 30° approach angle for 11° clearance triangle insert




Right hand (R) shown.
80° rhombic insert used for 06CA

| Designation | øDm1 | øDm2 | rε** | f | L1 | L2 | h1 | h2 | b | e1 | ℓ3 | β° | α° | t | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SCTPR06CA-05 | 20 | 30 | 0.4 | 5.4 | 25 | 9 | 6 | 7.5 | 5.5 | 12 | 4.5 | 0 | 0 | 3.5 | CP**0502... |
| STTPR/L08CA-09 | 25 | 35 | 0.4 | 6 | 32 | 10 | 8 | 11.5 | 7.5 | 17 | 6 | 0 | 0 | 4.5 | TP**0902... |
| STTPR10CA-11 | 40 | 55 | 0.4 | 9 | 50 | 15 | 10 | 14.5 | 10 | 20 | 8 | 0 | 0 | 5 | TP**1102... |

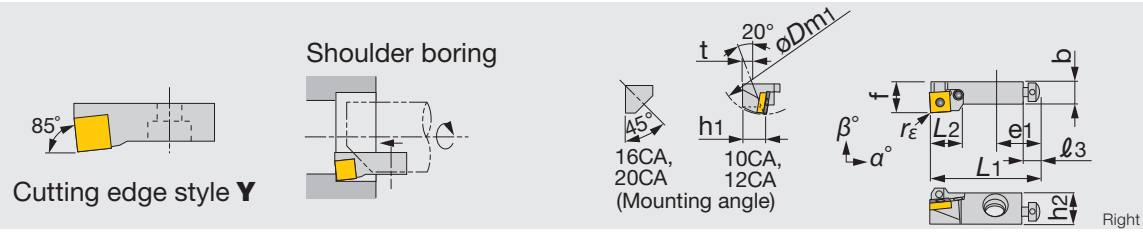
**SPARE PARTS**

| Designation | Clamping screw | Axial adjusting screw | Radial adjusting screw | Cartridge setting screw | Wrench | Torx wrench | Sizing plate ass'y (1) |
|---|---|---|---|---|---|---|---|
| SCTPR/L06CA-05 | CSTB-2.2S | ASM34S | SSHM3-6 | CHHM3.5-10 | P-1.5,P-3 | T-7F | PT06 |
| STTPR/L08CA-09 | CSTB-2.2S | ASM34L | SSHM3-6 | CHHM4-10 | P-1.5,P-3 | T-7F | PSTR/L08 |
| STTPR/L10CA-11 | CSTB-2.5 | ASM54 | SSHM4-10 | CHHM6-15 | P-2,P-5 | T-8F | PSTR/L10 |

(1) Optional

## PN PSYN-CA

Lever lock cartridge with 85° approach angle for negative square insert




Right hand (R) shown.

| Designation | øDm1 | øDm2 | rε** | f | L1 | L2 | h1 | h2 | b | e1 | ℓ3 | β° | α° | t | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PSYNR10CA-09 | 40 | - | 0.8 | 14 | 50 | 14 | 10 | 14.5 | 10 | 20 | 8 | -6 | -8 | 5 | SN**0903... |
| PSYNR12CA-12 | 50 | - | 0.8 | 20 | 55 | 18 | 12 | 19.5 | 15 | 20 | 8 | -6 | -8 | 6 | SN**1204... |
| PSYNR16CA | 55 | - | 0.8 | 25 | 63 | 26 | 16 | 16 | 17 | 25 | 8 | -6 | -8 | 0 | SN**1204... |
| PSYNR20CA | 70 | - | 1.2 | 25 | 70 | 30 | 20 | 20 | 19 | 30 | 10 | -6 | -7 | 0 | SN**1506... |

Note: • In above table, øDm1 is min. bore dia. for axial mounting and øDm2 is for radial mounting.
• When using a right or left hand insert, the right hand insert is used for left hand cartridge and the left hand insert is used for right hand cartridge.
• The left hand insert is used for the right hand cartridge and right hand insert is used for left hand cartridge.
• **rε: Standard corner radius

**SPARE PARTS**

| Designation | Shim | Lever | Clamping screw | Axial adjusting screw | Radial adjusting screw | Cartridge setting screw | Wrench | Shim retainer | Sizing plate | Sizing plate ass'y (1) |
|---|---|---|---|---|---|---|---|---|---|---|
| PSYNR10CA-09 | - | LCL32N | LCS22 | ASM54 | SSHM4-4 | CHHM4-4 | P-2F,P-5 | - | - | PSTR/L10 |
| PSYNR12CA-12 | - | LCL43N | LCS43 | ASM54 | SSHM4-4 | CHHM6-25 | P-2,P-2.5,P-5 | - | - | PSTR/L12 |
| PSYNR16CA | LSS42CA | LCL4 | LCS4CA | ASM6 | SSHM5-6 | BHM8-25U | P-2.5,P-3,P-5 | LSP4 | S0816B/S1016B | - |
| PSYNR20CA | LSS53CA | LCL5 | LCS5CA | ASM6 | SSHM5-6 | BHM8-30U | P-2.5,P-3,P-5 | LSP5 | S0820B/S1020B | - |

(1) Optional

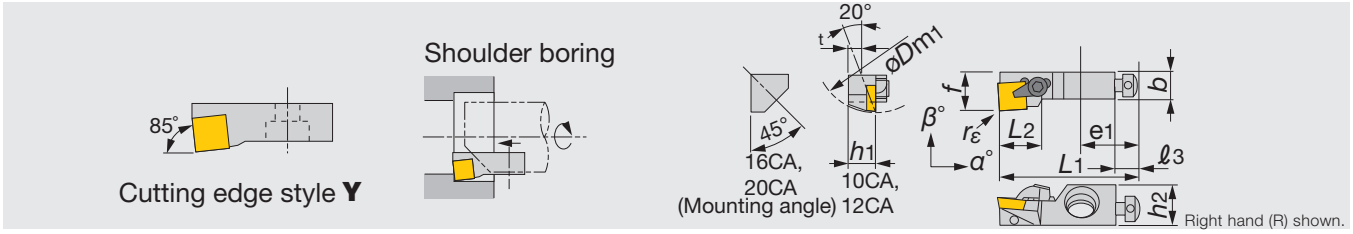
Tooling System

Inserts for SP STTP-CA → **B112** (CP**), **B131 -** (TP**), CBN → **B168 -**, PCD → **B178**

Inserts for PN PSYN-CA → **B070 -**, CBN → **B164 -**, PCD → **B176**

## CP CSYP-CA

Clamp on cartridge with 85° approach angle for 11° clearance square insert




Right hand (R) shown.

| Designation | øDm1 | rε** | f | L1 | L2 | h1 | h2 | b | e1 | ℓ3 | β° | α° | t | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CSYPR/L10CA-09 | 40 | 0.8 | 14 | 50 | 15 | 10 | 14.5 | 10 | 20 | 8 | 5 | 0 | 5 | SP**0903... |
| CSYPR12CA-12 | 50 | 0.8 | 20 | 55 | 19 | 12 | 19.5 | 15 | 20 | 8 | 5 | 2 | 6 | SP**1203... |
| CSYPR16CA | 55 | 0.8 | 25 | 63 | 23 | 16 | 16 | 17 | 25 | 8 | 5 | 0 | 0 | SP**1203... |

Note: • In above table, øDm1 is min. bore dia. for axial mounting and øDm2 is for radial mounting.
• When using a right or left hand insert, the right hand insert is used for left hand cartridge and the left hand insert is used for right hand cartridge.

### SPARE PARTS

| Designation | Cartridge setting screw | Sizing plate | Sizing plate 1 | Wrench | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|
| CSYPR/L10CA-09 | CHHM6-15 | - | - | P-2 | P-2.5 | P-5 |
| CSYPR12CA-12 | CHHM6-25 | - | - | P-2 | P-3 | P-5 |
| CSYPR16CA | BHM8-25U | - | - | P-2.5 | P-4 | - |

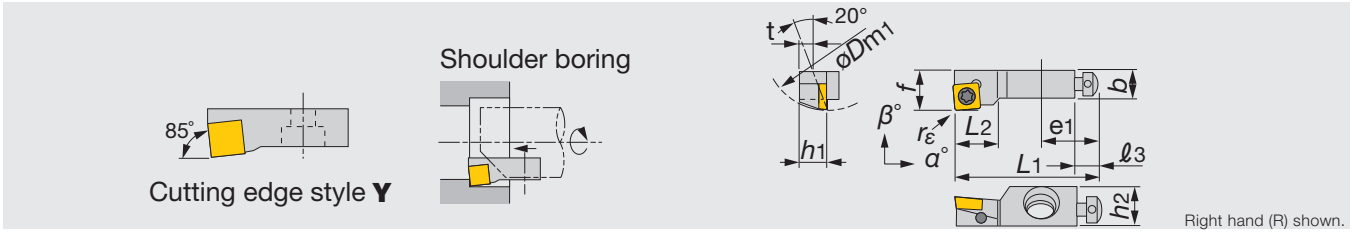
| Designation | Shim | Lever | Clamping screw | Axial adjusting screw | Radial adjusting screw | Chipbreaker piece | Sizing plate ass'y (1) |
|---|---|---|---|---|---|---|---|
| CSYPR/L10CA-09 | - | - | CSG-5 (CSG-5S) | ASM54 | SSHM4-10 | CBS-3M | PSTR/L10 |
| CSYPR12CA-12 | - | - | CSG-6 (CSG-6S) | ASM54 | SSHM4-14 | CBS-4M | PSTR/L12 |
| CSYPR16CA | PAS-42 | SM3X0.5X8 | CSG-8S | ASM6 | SSHM5-16 | - | - |

Notes : Cartridges of K-style cutting edge uses S0816A or S1016A,whilst ones of S-style uses S0816C or S1016B (*marked).
When not using Chipbreaker piece, clamping screw in ( ) should be used.

(1) Optional

## SP SSYP-CA

Screw on cartridge with 85° approach angle for 11° clearance square insert




Right hand (R) shown.

| Designation | øDm1 | rε** | f | L1 | L2 | h1 | h2 | b | e1 | ℓ3 | β° | α° | t | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SSYPR10CA-09 | 40 | 0.8 | 14 | 50 | 15 | 10 | 14.5 | 10 | 20 | 8 | 5 | 0 | 5 | SP**0903... |

• The left hand insert is used for the right hand cartridge and right hand insertis used for left hand cartridge
• **rε: Standard corner radius

### SPARE PARTS

| Designation | Clamping screw | Wrench | Wrench 1 | Wrench 2 |
|---|---|---|---|---|
| SSYPR10CA-09 | CSTB-4S | P-2 | T-15F | P-5 |

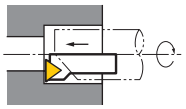
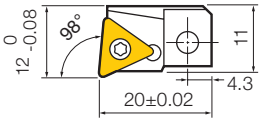
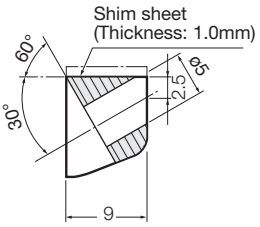
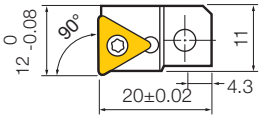
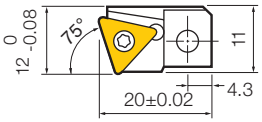
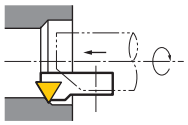
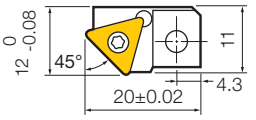
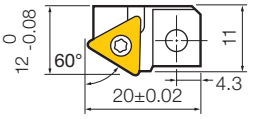
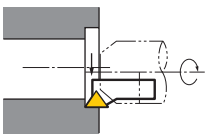
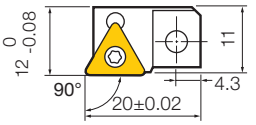
| Designation | Axial adjusting screw | Radial adjusting screw | Cartridge setting screw | Sizing plate ass'y (1) |
|---|---|---|---|---|
| SSYPR10CA-09 | ASM54 | SSHM4-10 | CHHM6-15 | PSTR/L10 |

(1) Optional

Inserts for CP CSYP-CA → **B123 -**, CBN → **B168 -**, PCD → **B177**

Inserts for SP SSYP-CA → **B123 -**, CBN → **B168**

# A-type (Positive rake, compact type)

| Application | | Shape | Designation | Specification |
|---|---|---|---|---|
| Boring |  |  | **ATX-0 R/L** | ●Applicable inserts<br>TP□□1103□□<br>(With Tungaloy's standard hole)<br>**B131-, B168**<br>●Min. bore diameter<br>ø32<br>●Cutting edge height<br>9 mm<br>●Dimension for mounting<br>  |
| | |  | **ATF-0 R/L** | |
| | |  | **ATK-0 R/L** | |
| Chamfering |  |  | **ATS-0 R/L** | |
| | |  | **ATT-0 R/L** | |
| Facing |  |  | **ATG-0 L** | |

Note: Right hand (R) shown.

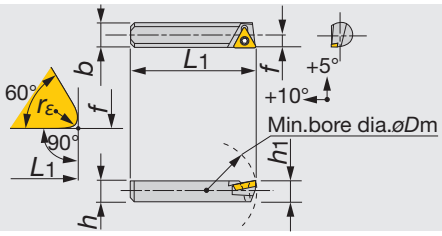
**SPARE PARTS**

| Designation | Mounting screw | Adjusting screw (axial direction) | Insert clamping screw | Shim sheet | Wrench |
|---|---|---|---|---|---|
| For all products | M4×15 | M3×0.5×8 | CSTA-NO2L | SM-00 | P-1.5, T-8F |

# Boring bar tool

## TBS1

90° approarch angle with square shank




TBS1**T** shown.

| Designation | øDm | f | h1 | L2 | b | h | L1 | rε** | Insert |
|---|---|---|---|---|---|---|---|---|---|
| TBS108T08 | 25 | 7.8 | 7.8 | 9 | 8 | 8 | 40 | 0.4 | TP**0802... |
| TBS110T09 | 38 | 9.8 | 9.8 | 10 | 10 | 10 | 50 | 0.4 | TP**0902... |
| TBS113T11 | 50 | 12.8 | 12.8 | 12 | 13 | 13 | 60 | 0.4 | TP**1102... |
| TBS116C12 | 62 | 15.8 | 15.8 | 18 | 16 | 16 | 80 | 0.8 | CP**1204... |
| TBS119C12 | 72 | 18.8 | 18.8 | 18 | 19 | 19 | 95 | 0.8 | CP**1204... |
| TBS125C16 | 82 | 24.8 | 24.8 | 22 | 25 | 25 | 125 | 1.2 | CP**1605... |

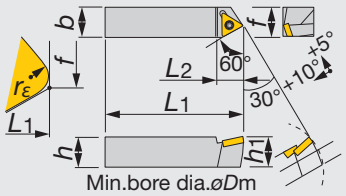
Note: • Figures shown above are of 16 mm or larger square shank types used for normal direction of rotation.
• For the tools used for reverse direction of rotation, letter "H" is added in the last position of the Cat. No. (Example: TBS308T08H)
• TBS116C12 TBS316C12 and TBS416C12 are without-shim types.
• For the tools for normal direction of rotation, use a left hand insert, and for reverse direction of rotation, use a right hand insert.
• **rε: Standard corner radius

### SPARE PARTS

| Designation | Clamping screw | Shim screw | Shim | Wrench | Wrench 1 |
|---|---|---|---|---|---|
| TBS108T08 | CSTB-2L | - | - | - | T-6F |
| TBS110T09 | CSTB-2.2 | - | - | - | T-7F |
| TBS113T11 | CSTB-2.5 | - | - | - | T-8F |
| TBS116C12 | CSTB-5 | - | - | - | T-20F |
| TBS119C12 | CSTB-4F | DTS6-4 | SSC4T3-P | P-4 | T-15F |
| TBS125C16 | CSTB-4F | DTS6-4 | SSC54-P | P-4 | T-15F |

## TBS3

30° approarch angle with square shank




TBS3**T** shown.

| Designation | øDm | f | h1 | L2 | b | h | L1 | rε** | Insert |
|---|---|---|---|---|---|---|---|---|---|
| TBS308T08 | 25 | 4.7 | 7.8 | 8 | 8 | 8 | 40 | 0.4 | TP**0802... |
| TBS310T09 | 38 | 6 | 9.8 | 11 | 10 | 10 | 50 | 0.4 | TP**0902... |
| TBS313T11 | 50 | 8.3 | 12.8 | 12 | 13 | 13 | 60 | 0.4 | TP**1102... |
| TBS316C12 | 62 | 9.7 | 15.8 | 21 | 16 | 16 | 80 | 0.8 | CP**1204... |
| TBS319C12 | 72 | 12.7 | 18.8 | 21 | 19 | 19 | 95 | 0.8 | CP**1204... |

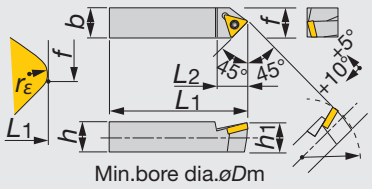
Note: • Figures shown above are of 16 mm or larger square shank types used for normal direction of rotation.
• For the tools used for reverse direction of rotation, letter "H" is added in the last position of the Cat. No. (Example: TBS308T08H)
• TBS116C12 TBS316C12 and TBS416C12 are without-shim types.
• For the tools for normal direction of rotation, use a left hand insert, and for reverse direction of rotation, use a right hand insert.
• **rε: Standard corner radius

### SPARE PARTS

| Designation | Clamping screw | Shim screw | Shim | Wrench | Wrench 1 |
|---|---|---|---|---|---|
| TBS308T08 | CSTB-2L | - | - | - | T-6F |
| TBS310T09 | CSTB-2.2 | - | - | - | T-7F |
| TBS313T11 | CSTB-2.5 | - | - | - | T-8F |
| TBS316C12 | CSTB-5 | - | - | - | T-20F |
| TBS319C12 | CSTB-4F | DTS6-4 | SSC4T3-P | P-4 | T-15F |

## TBS4

45° approarch angle with square shank




TBS4**T** shown.

| Designation | øDm | f | h1 | L2 | b | h | L1 | rε** | Insert |
|---|---|---|---|---|---|---|---|---|---|
| TBS408T08 | 25 | 3.2 | 7.8 | 9 | 8 | 8 | 40 | 0.4 | TP**0802... |
| TBS410T09 | 38 | 4.2 | 9.8 | 10 | 10 | 10 | 50 | 0.4 | TP**0902... |
| TBS413T11 | 50 | 6.2 | 12.8 | 14 | 13 | 13 | 60 | 0.4 | TP**1102... |
| TBS416C12 | 62 | 7.3 | 15.8 | 22 | 16 | 16 | 80 | 0.8 | CP**1204... |
| TBS419C12 | 72 | 10.3 | 18.8 | 22 | 19 | 19 | 95 | 0.8 | CP**1204... |
| TBS425C16 | 82 | 14.2 | 24.8 | 26 | 25 | 25 | 125 | 1.2 | CP**1605... |

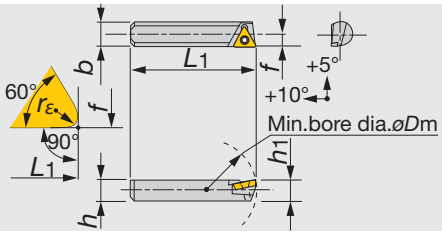
Note: • Figures shown above are of 16 mm or larger square shank types used for normal direction of rotation.
• For the tools used for reverse direction of rotation, letter "H" is added in the last position of the Cat. No. (Example: TBS308T08H)
• TBS116C12 TBS316C12 and TBS416C12 are without-shim types.
• For the tools for normal direction of rotation, use a left hand insert, and for reverse direction of rotation, use a right hand insert.
• **rε: Standard corner radius

### SPARE PARTS

| Designation | Clamping screw | Shim screw | Shim | Wrench | Wrench 1 |
|---|---|---|---|---|---|
| TBS408T08 | CSTB-2L | - | - | - | T-6F |
| TBS410T09 | CSTB-2.2 | - | - | - | T-7F |
| TBS413T11 | CSTB-2.5 | - | - | - | T-8F |
| TBS416C12 | CSTB-5 | - | - | - | T-20F |
| TBS419C12 | CSTB-4F | DTS6-4 | SSC4T3-P | P-4 | T-15F |
| TBS425C16 | CSTB-4F | DTS6-4 | SSC54-P | P-4 | T-15F |

## TBR1

90° approarch angle with round shank




TBR1**T** shown.

| Designation | øDm | f | h1 | h | øDs | L1 | rε** | Insert |
|---|---|---|---|---|---|---|---|---|
| TBR108T08 | 30 | 4 | 7 | 7 | 8 | 35 | 0.2 | TP**0802... |
| TBR110T09 | 40 | 5 | 8.5 | 8.5 | 10 | 50 | 0.2 | TP**0902... |
| TBR112T11 | 50 | 6 | 10.5 | 10.5 | 12 | 60 | 0.2 | TP**1102... |

Note: • Figures shown above are of 6 mm or smaller diameter shank used for normal direction of rotation.
• For the tools used for reverse direction of rotation, letter "H" is added in the last position of the Cat. No. (Example: TBR105E04H)
• For the tools for normal direction of rotation, use a left hand insert, and for reverse direction of rotation, use a right hand insert.
• **rε: Standard corner radius

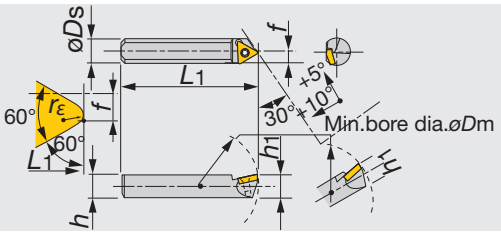
### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| TBR108T08 | CSTB-2L | T-6F |
| TBR110T09 | CSTB-2.2 | T-7F |
| TBR112T11 | CSTB-2.5 | T-8F |

Inserts for TBS1, TBS3, TBS4, TBR1 →
**B131 -** (TP**), **B111** (CP**), CBN → **B168 -**, PCD → **B178**

## TBR3

30° approarch angle with round shank




TBR3**T** shown.

| Designation | øDm | f | h1 | h | øDs | L1 | rε** | Insert |
|---|---|---|---|---|---|---|---|---|
| TBR305E04 | 19 | 0.5 | 4 | 4 | 5 | 20 | 0.2 | EP**0401... |
| TBR308T08 | 30 | 0.5 | 7 | 7 | 8 | 35 | 0.2 | TP**0802... |
| TBR312T11 | 50 | 1 | 10.5 | 10.5 | 12 | 60 | 0.4 | TP**1102... |
| TBR316T16 | 60 | 1.5 | 14 | 14 | 16 | 80 | 0.8 | TP**16T3... |

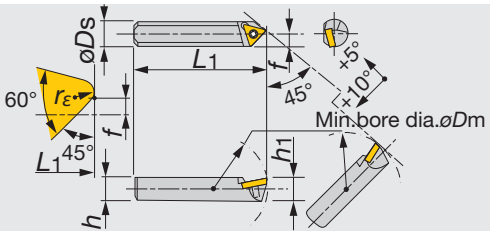
Note: • Figures shown above are of 6 mm or smaller diameter shank used for normal direction of rotation.
• For the tools used for reverse direction of rotation, letter "H" is added in the last position of the Cat. No. (Example: TBR105E04H)
• For the tools for normal direction of rotation, use a left hand insert, and for reverse direction of rotation, use a right hand insert.
• **rε: Standard corner radius

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| TBR305E04 | CSTB-2 | T-6F |
| TBR308T08 | CSTB-2L | T-6F |
| TBR312T11 | CSTB-2.5 | T-8F |
| TBR316T16 | CSTB-4 | T-15F |

## TBR4

45° approarch angle with round shank




TBR4**T** shown.

| Designation | øDm | f | h1 | h | øDs | L1 | rε** | Insert |
|---|---|---|---|---|---|---|---|---|
| TBR406E04 | 24 | 0 | 5 | 5 | 6 | 25 | 0.2 | EP**0401... |
| TBR408T08 | 30 | 0.5 | 7 | 7 | 8 | 35 | 0.2 | TP**0802... |
| TBR410T09 | 40 | 1 | 8.5 | 8.5 | 10 | 50 | 0.2 | TP**0902... |
| TBR412T11 | 50 | 1 | 10.5 | 10.5 | 12 | 60 | 0.4 | TP**1102... |
| TBR416T16 | 60 | 1.5 | 14 | 14 | 16 | 80 | 0.8 | TP**16T3... |

Note: • Figures shown above are of 6 mm or smaller diameter shank used for normal direction of rotation.
• For the tools used for reverse direction of rotation, letter "H" is added in the last position of the Cat. No. (Example: TBR105E04H)
• For the tools for normal direction of rotation, use a left hand insert, and for reverse direction of rotation, use a right hand insert.
• **rε: Standard corner radius

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| TBR406E04 | CSTB-2 | T-6F |
| TBR408T08 | CSTB-2L | T-6F |
| TBR410T09 | CSTB-2.2 | T-7F |
| TBR412T11 | CSTB-2.5 | T-8F |
| TBR416T16 | CSTB-4 | T-15F |



Inserts for TBR3, TBR4 →
**B120 -** (EP**), **B131 -** (TP**), CBN → **B168 -**, PCD → **B178**

# Top-Borer Tool

## Features

- Indexable insert jig boring tools usable for commercially available adjustable boring heads.
- Minimum bore diameter ø5.5 mm.
- Available in three types of SEXP, SWUB and STUP.



**Applicable for PINZBOHR small diameter finish boring heads.**
(F142)

## Applications by Type

| | |
|---|---|
| SEXP  | • Minimum bore diameter: ø5.5 mm.<br>• A 75° rhombic insert is used. Stable insert holding assures precision boring. |
| SWUB  | • Available in two sizes of minimum bore diameters of ø7 and ø8 mm.<br>• Uses an economical trigon insert. |
| STUP  | • Available in five sizes of minimum bore diameters of ø10, ø12, ø14, ø16 and ø18 mm.<br>• Many standard items make them applicable for a wide range of applications. |

## Designation system for Top-Borer Tools

| Symbol | Material |
|---|---|
| S | Steel |
| C | Carbide |

① Shank material

| Symbol | Min. bore diameter ø$D_m$ |
|---|---|
| 055 | 5.5 |
| 07 | 7 |
| 08 | 8 |
| 10 | 10 |

③ Min. bore dia.

| Symbol | Insert type |
|---|---|
| 04 | EPGT0401□□ |
| 03 | WBGT0301□□ |
| 08 | TPGT0802□□ |
| 11 | TPGT1102□□ |

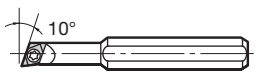
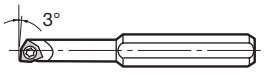
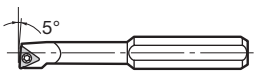
⑥ Applicable insert

**S** ① **08** ② **055** ③ **SEXP** ④ **R** ⑤ **04** ⑥

② Shank size

| Symbol | Shank diameter (mm) |
|---|---|
| 08 | 8 |
| 10 | 10 |
| 12 | 12 |
| 16 | 16 |

④ Tool shape

| Symbol | Shape |
|---|---|
| SEXP |   |
| SWUB |   |
| STUP |   |

⑤ Hand of cartridge

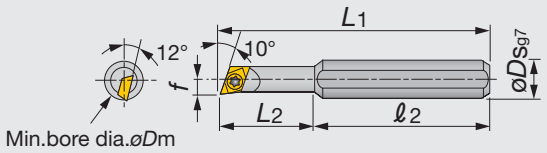
| Symbol | Hand |
|---|---|
| R | Right |
| L | Left |
| N | Neutral |

**Avilable holders are supplied from tooling manufactures.**

# Top-borer tool

## S/C-SEXPR/L

Top-Borer Tools, for posi 75° rhombic insert with 11° clearance




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | ℓ2 | rε** | Insert |
|---|---|---|---|---|---|---|---|---|---|
| S08055-SEXPR04 | STEEL | 5.5 | 8 | 2.8 | 45 | 19 | 26 | 0.4 | EP**0401... |
| S10055-SEXPR04 | STEEL | 5.5 | 10 | 2.8 | 51 | 19 | 32 | 0.4 | EP**0401... |
| S12055-SEXPR04 | STEEL | 5.5 | 12 | 2.8 | 51 | 19 | 32 | 0.4 | EP**0401... |
| C10055-SEXPR04 | CARBIDE | 5.5 | 10 | 2.8 | 62 | 30 | 32 | 0.4 | EP**0401... |
| C12055-SEXPR04 | CARBIDE | 5.5 | 12 | 2.8 | 62 | 30 | 32 | 0.4 | EP**0401... |

Note: • When using an insert with hand, right hand (R) holders use a left hand (L) insert.
• Left hand (L) holders use a right hand (R) insert.
• **rε: Standard corner radius

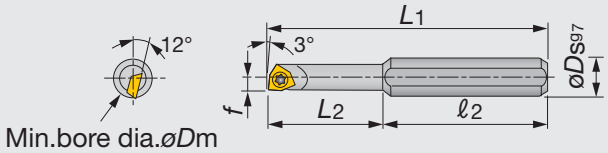
### SPARE PARTS




| Designation | Clamping screw | Wrench |
|---|---|---|
| S/C-SEXPR | CSTB-2 | T-6F |

## S/C-SWUBR/L

Top-Borer Tools, for posi trigon insert with 5° clearance




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | ℓ2 | rε** | Insert |
|---|---|---|---|---|---|---|---|---|---|
| S1008-SWUBR03 | STEEL | 8 | 10 | 4.1 | 60 | 28 | 32 | 0.4 | WBGT0301... |
| S1208-SWUBR03 | STEEL | 8 | 12 | 4.1 | 60 | 28 | 32 | 0.4 | WBGT0301... |
| C1008-SWUBR03 | CARBIDE | 8 | 10 | 4.1 | 76 | 44 | 32 | 0.4 | WBGT0301... |
| C1208-SWUBR03 | CARBIDE | 8 | 12 | 4.1 | 76 | 44 | 32 | 0.4 | WBGT0301... |

Note: • The hole of inserts conforms to ISO standard. When using an insert with hand, right hand (R) holders use a left hand (L) insert.
• Left hand (L) holders use a right hand (R) insert.
• **rε: Standard corner radius

### SPARE PARTS




| Designation | Clamping screw | Wrench |
|---|---|---|
| S/C-SWUBR | CSTB-2 | T-6F |

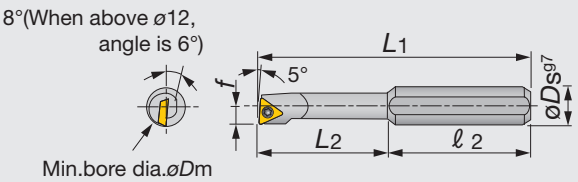


Inserts for S/C-SEXPR/L → **B120 -,** CBN → **B171,** PCD → **B178**

Inserts for S/C-SWUBR/L → **B141**

## S/C-STUPR/L

Top-Borer Tools, for posi triangle insert with 11° clearance




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | ℓ2 | rε** | Insert |
|---|---|---|---|---|---|---|---|---|---|
| S0810-STUPR08 | STEEL | 10 | 8 | 5 | 61 | - | - | 0.4 | TPGT0802... |
| S1010-STUPR08 | STEEL | 10 | 10 | 5 | 67 | 35 | 32 | 0.4 | TPGT0802... |
| S1210-STUPR08 | STEEL | 10 | 12 | 5 | 67 | 35 | 32 | 0.4 | TPGT0802... |
| S1212-STUPR08 | STEEL | 12 | 12 | 6 | 74 | 42 | 32 | 0.4 | TPGT0802... |
| S1212-STUPR11 | STEEL | 12 | 12 | 6 | 74 | 42 | 32 | 0.4 | TPGT1102... |
| S1214-STUPR11 | STEEL | 14 | 12 | 7 | 81 | - | - | 0.4 | TPGT1102... |
| C1010-STUPR08 | CARBIDE | 10 | 10 | 5 | 87 | 55 | 32 | 0.4 | TPG*0802... |
| C1210-STUPR08 | CARBIDE | 10 | 12 | 5 | 87 | 55 | 32 | 0.4 | TPG*0802... |
| C1212-STUPR11 | CARBIDE | 12 | 12 | 6 | 98 | 66 | 32 | 0.4 | TPG*1102... |
| C1214-STUPR11 | CARBIDE | 14 | 12 | 7 | 109 | 84 | 25 | 0.4 | TPG*1102... |

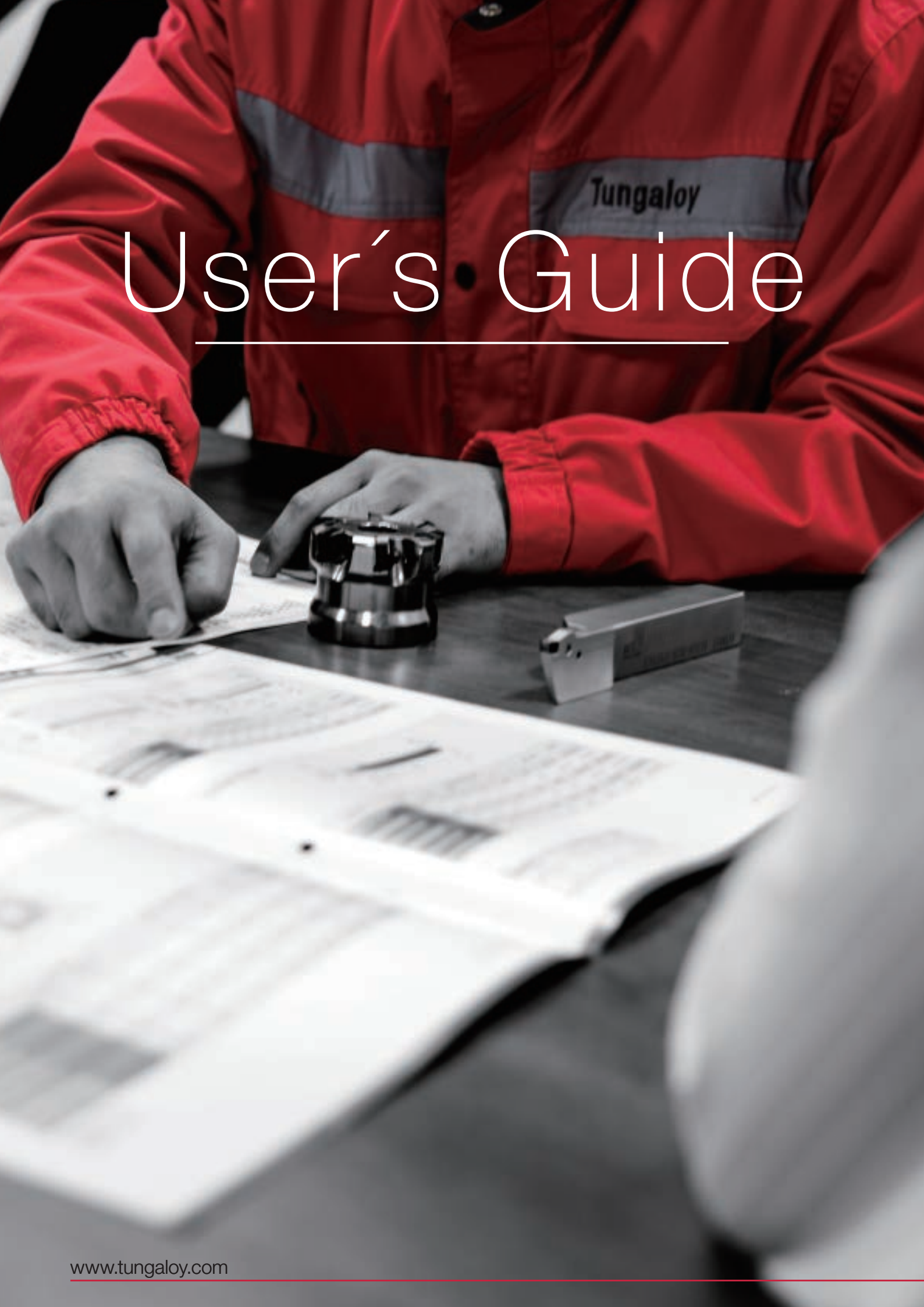
Note: • When using an insert with hand, right hand (R) holders use a left hand (L) insert.
• Left hand (L) holders use a right hand (R) insert.
• **rε: Standard corner radius

### SPARE PARTS




| Designation | Clamping screw | Wrench |
|---|---|---|
| S**10-STUPR08 | CSTB-2L040 | T-6F |
| S1212-STUPR08 | CSTB-2L | T-6F |
| S121*-STUPR11 | CSTB-2.5 | T-8F |
| C1*10-STUPR08 | CSTB-2L040 | T-6F |
| C121*-STUPR11 | CSTB-2.5 | T-8F |

Inserts for S/C-STUPR/L → **B131 -,** CBN → **B168 -,** PCD → **B178**




# User´s Guide

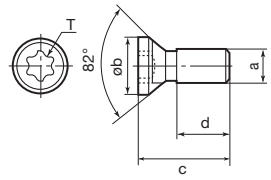
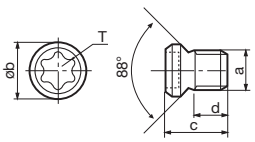
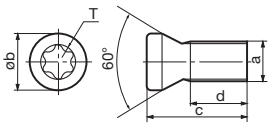
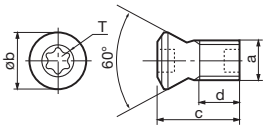
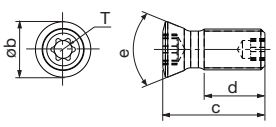
# USER´S GUIDE


Parts for Tool G002

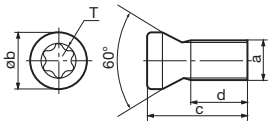
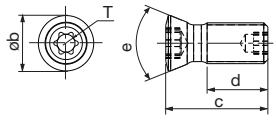
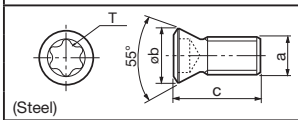
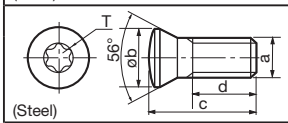
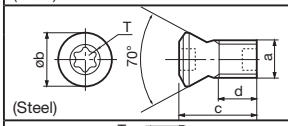
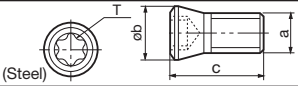
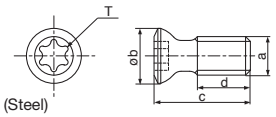
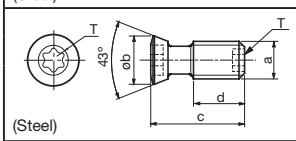
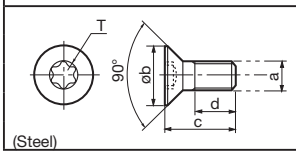
Technical Reference G029

Alphanumeric Index G084

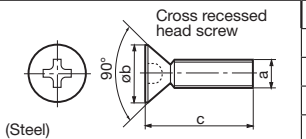
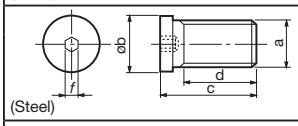
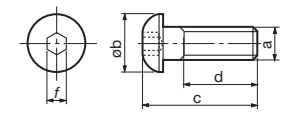
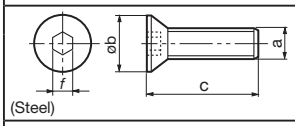
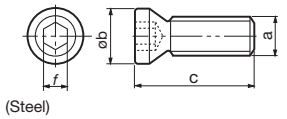
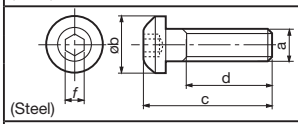
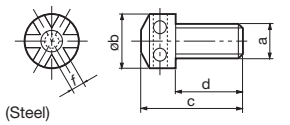
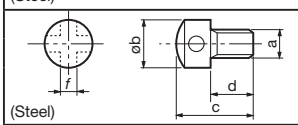
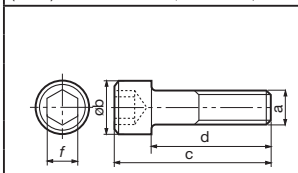
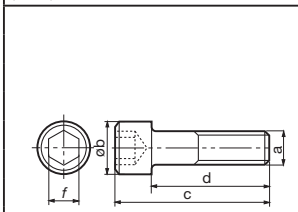
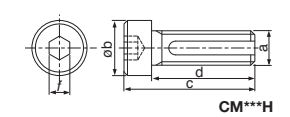
## Screws

| Shape | Designation | Dimension (mm) | | | | | | Torque (N·m) |
|---|---|---|---|---|---|---|---|---|
| | | a | øb | c | d | e | T / f | |
|  (Steel) | **CSTA-NO2** | #2-56UNC | 4 | 6 | 4 | 82 | T8 | 1.3 |
| | **CSTA-NO2S** | | | 5 | 3 | | | |
| | **CSTA-NO2L** | | | 8 | 6 | | | |
| | **CSTA-NO3** | #3-48UNC | 4.3 | 7 | 4 | | T9 | 2.3 |
| | **CSTA-NO5** | #5-40UNC | 5 | 8 | 5 | | | |
| | **CSTA-1.6** | M1.6x0.35 | 2.5 | 3.1 | 0.9 | | T6 | 0.6 |
| | **CSTA-4** | M4x0.7 | 7 | 10 | 7.7 | | T15 | 3.5 |
| | **CSTA-5** | M5x0.8 | 7.2 | 15 | 11 | | | |
| | **CSTA-5S** | | | 12 | 8 | | | |
| | **CSTA-5SS** | | | 9.5 | 5.5 | | | |
| | **CSTA-5ST25** | | | 12 | 8 | | T25 | 5 |
| | **CSPA-5IP15** | | 7.1 | 15 | 11 | | 15IP | 3.5 |
| | **CSPA-5SIP15** | | | 12 | 8 | | | |
| | **CSPA-5IP20** | | | 15 | 11 | | 20IP | 5 |
| | **CSPA-5SIP20** | | | 12 | 8 | | | |
|  CSP-2L033 type shown | **CSP-2L033** | M2x0.4 | 2.6 | 3.3 | 1.9 | 88 | 6IP | 0.7 |
| | **CSTB-2** | | 2.7 | 3.3 | 1.4 | 60 | T6 | 0.7 |
| | **CSTB-2L** | | | 5.2 | 3.3 | | | |
| | **CSTB-2L040** | | | 4 | 2.1 | | | |
| | **CSTB-2.2** | M2.2x0.45 | 3.5 | 6.1 | 3.5 | | T7 | 1 |
| | **CSTB-2.2L038** | | | 3.8 | 2.2 | | | |
| | **CSTB-2.2S** | | | 4.6 | 2 | | | |
| | **CSTB-2.2R** | | 3.1 | 6.1 | 3.7 | | | |
| | **CSTB-2.5** | M2.5x0.45 | 3.5 | 6 | 3.4 | | T8 | 1.3 |
| | **CSTB-2.5L080** | | | 8 | 5.4 | | | |
| | **CSTB-2.5B** | | | 5.5 | 2.6 | | | |
| | **CSTB-2.5S** | | | 4.8 | 2.2 | | | |
|  | **CSTB-3** | M3x0.5 | 4.1 | 8 | 4.5 | | T9 | 2.3 |
| | **CSTB-3L042** | | | 4.2 | 0.7 | | | |
| | **CSTB-3L050** | | | 5 | 2 | | | |
| | **CSTB-3L081** | | 4.2 | 8.1 | 4.7 | | T8 | |
| | **CSTB-3S** | | 4.1 | 6 | 2.5 | | T9 | |
|  CSTB-4SD type shown | **CSTB-3.5ST** | M3.5x0.6 | 5.5 | 12.5 | 4 | | T15 | 3.5 |
| | **CSTB-3.5H** | | 5.2 | 6.5 | 3.1 | | | |
| | **CSTB-3.5** | | 5.5 | 8.4 | 4.3 | | | |
| | **CSTB-3.5T** | | 6.5 | 10 | 5.5 | | T20 | 5 |
| | **CSTB-3.5TS** | | | 8.5 | 4 | | | |
| | **CSTB-3.5D** | | 4.7 | 8.4 | 4.9 | | T9 | 2.3 |
| | **CSTB-3.5L110** | | 5.5 | 11 | 7.5 | | T15 | 3.5 |
| | **CSTB-3.5L115** | | 4.8 | 11.5 | 7 | | T10 | 2.5 |
| | **CSTB-3.5L115-S** | | 4.8 | 11.5 | 6.5 | | | 3.5 |
|  CSTC-4L type shown | **CSTB-3.5L** | M4x0.7 | 5.5 | 12.5 | 8.4 | | T15 | 3.5 |
| | **CSTB-4** | | | 11.4 | 7.4 | | | |
| | **CSTB-4L060** | | | 6 | 2 | | | |
| | **CSTB-4L085** | | | 8.48 | 3.48 | | | |
| | **CSTB-4L090** | | 5.7 | 9 | 5.5 | | | |
| | **CSTB-4L115-S** | | 5.5 | 11.5 | 6.5 | | | 5.5 |
| | **CSTB-4S** | | 5.5 | 8 | 4 | | | 3.5 |
| | **CSTB-4ST** | M4x0.5 | 6.4 | 14.7 | | | | |
| | **CSTB-4SD** | M4x0.7 | 5.5 | 8 | | | T8 | 1.3 |
| | **CSTB-4M** | | | 9.5 | 5.5 | | T15 | 3.5 |
| | **CSTB-4F** | M4x0.5 | 7 | 14.7 | 8.7 | | | |
| | **CSTB-4TS** | M4x0.7 | 6.5 | 9 | 4.5 | | T20 | 5 |
| | **CSTB-5** | M5x0.8 | 7 | 12 | 7.5 | | | |
| | **CSTB-5S** | | | 9.5 | 5 | | | |
| | **CSTB-5L105** | | | 10.5 | 6.1 | | | |
| | **CSTB-5L120** | | | 12 | 6.5 | | | |
| | **CSTB-5L159** | | 7.2 | 15.9 | 11.2 | | | |
| | **CSTB-5L163-S** | | 6.9 | 16.3 | 11.3 | | | 6 |
| | **CSTC-4L055DR** | M4x0.5 | 5.42 | 5.5 | 2 | 44 | T8/T10 | 1.3/2.5 |
| | **CSTC-4L055DL** | M4x0.5 | 5.42 | 5.5 | 2 | | T8/T10 | 1.3/2.5 |
| | **CSTC-4L100DR** | M4x0.7 | 5.42 | 10 | 5.95 | | T8/T10 | 1.3/2.5 |
| | **CSTC-4L100DL** | M4x0.7 | 5.42 | 10 | 5.95 | | T8/T10 | 1.3/2.5 |
| (Steel) | **CSPB-2L043** | M2x0.4 | 2.7 | 4.3 | 2.5 | 60 | 6IP | 0.7 |
| | **CSPB-2H** | | 2.6 | 3.4 | 1.6 | | | |

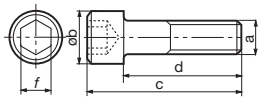
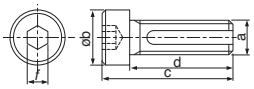
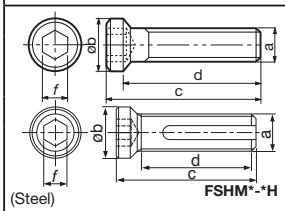
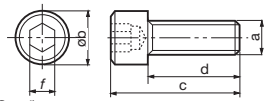
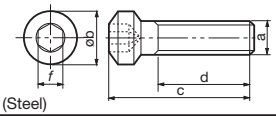
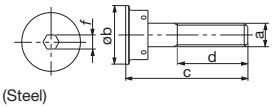
## Screws

| Shape | Designation | Dimension (mm) | | | | | | Torque (N·m) |
|---|---|---|---|---|---|---|---|---|
| | | a | øb | c | d | e | T / f | |
|  | **CSPB-2.2** | M2.2x0.45 | 3 | 6 | 3.9 | | 7IP | 1 |
| | **CSPB-2.2SH** | | | 4 | 2 | | | 1.1 |
| | **CSPB-2.5** | M2.5x0.45 | 3.5 | 6 | 3.5 | | 8IP | 1.3 |
| | **CSPB-2.5S** | | | 4.2 | 1.7 | | | |
| | **CSPB-2.5SH** | | 3.3 | 5.2 | 3.3 | | 7IP | 1.1 |
| | **CSPB-3.5** | M3.5x0.6 | 5.2 | 9 | 5.6 | | 15IP | 3.5 |
| | **CSPB-3.5S** | | | 6.5 | 3.1 | | | |
| | **CSPB-4** | M4x0.7 | 5.5 | 11.6 | 7.4 | | | |
| | **CSPB-4S** | | | 8.2 | 4 | | | |
| | **CSPB-5** | M5x0.8 | 7 | 12 | 7.5 | | 20IP | 5 |
|  SCREW TORX M4 L=9.5MM type shown | **VX040024A** | M4 | 5.45 | 9 | 6 | 60 | T15 | 4.5 |
| | **VX040028A** | M4 | 5.2 | 9.7 | 4.7 | 44 | T15 | 4.5 |
| | **SR14-500/L5.1** | M4 | 5.5 | 5.1 | 2.3 | | T15 | 3.5 |
| | **SR14-500-L7.0** | M4 | 5.5 | 7 | 4.2 | | T15 | 3.5 |
| | **SR14-562** | M3.5 | 4.8 | 8.75 | 5.55 | | T10 | 2.5 |
| | **SR14-562/S** | M3.5 | 4.8 | 6.5 | 3.3 | 60 | T10 | 2.5 |
| | **SR14-591** | M5x0.8 | 6.6 | 13.5 | 7.6 | | T20 | 5 |
| | **SR34-508** | M2.2x0.45 | 3.15 | 4.6 | 2.67 | | T7 | 0.9 |
| | **SR34-514** | M2.5x0.45 | 3.3 | 5.2 | 3.2 | | T7 | 0.9 |
| | **SR76-943** | M6 | 9.6 | 20 | 10 | 90 | T20 | 5 |
| | **SR76-961** | M5 | 6.6 | 13.5 | 7.35 | 61 | T15 | 3.5 |
| | **SR76-963** | M5 | 8.6 | 20 | 9.6 | 91 | T15 | 3.5 |
| | **SR114-018-L3.40** | M2.5 | 3.6 | 3.35 | 2 | 56 | T6 | 0.7 |
| | **SM40-143-H0** | M4X0.7 | 5.6 | 14.3 | 8.4 | 61 | T15 | 3.5 |
| | **TS25F080A** | M2.25X0.35 | 3.7 | 6.9 | 2.1 | | T8 | 1.3 |
| | **TS30F100A** | M3X0.35 | 4.6 | 8.3 | 2.2 | 60 | T10 | 2.5 |
| | **TS40085I/HG** | M4 | 5.7 | 8.5 | 4.5 | | T15 | 3.5 |
| | **TS40093I/HG** | M4 | 5.7 | 9.3 | 4.3 | | T15 | 3.5 |
| | **TS40B100I** | M4 | 6 | 10 | 6 | R3.0 | T15 | 3.5 |
| | **TS40F120A** | M4X0.5 | 6 | 10.6 | 3 | 60 | T15 | 3.5 |
| | **TS45120I** | M4.5 | 6.9 | 12 | 7.5 | R3.5 | T20 | 5 |
| | **TS50115I** | M5 | 7 | 11.35 | 6.4 | | T20 | 5 |
| | **TS50F160A** | M5X0.5 | 7 | 13.9 | 3.5 | | T20 | 5 |
| | **TS60F200A** | M6X0.75 | 8.2 | 16.7 | 4.5 | 60 | T20 | 7 |
| | **TS70F250A** | M7X0.75 | 10 | 21 | 5.6 | | T25 | 7 |
| (Steel) | **TS80F300A** | M8X1.0 | 12 | 25 | 7.3 | | T30 | 10 |
|  (Steel) | **CSPD-1.8S** | M1.8x0.35 | 2.4 | 3.3 | 1.4 | | 6IP | 0.7 |
| | **CSTD-3T** | M3x0.5 | 4.3 | 7 | 4.5 | 55 | T10 | 2.5 |
| | **CSPD-3** | | | | 4.2 | | 10IP | 2.5 |
| | | | | | | | | |
|  (Steel) | **CSTB-4.5L110P** | M4.5X0.75 | 6.6 | 11.7 | 7 | 56 | T15 | 3.5 |
| | | | | | | | | |
|  (Steel) | **SRM5X0.8IP20X+ACROLYTE** | M5X0.8 | 9.2 | 15 | 9.8 | 70 | 20IP | 7.5 |
| | | | | | | | | |
|  (Steel) | **CSTC-2** | M2x0.4 | 3.1 | 5.1 | - | | T6 | 0.7 |
| | | | | | | | | |
|  (Steel) | **CSTR-4L100** | M4x0.7 | 5.7 | 10 | 5.5 | | T15 | 3.5 |
| | | | | | | | | |
|  (Steel) | **SR16-212-01397** | M5x0.8 | 6.4 | 12.5 | 6.8 | 43 | T20/T10 | 2.5 |
| | **SR16-212-01397L** | | | | | | | |
| | | | | | | | | |
|  (Steel) | **CST-3.5** | M3.5X0.6 | 6 | 4.8 | - | | T9 | 2.3 |
| | **CST-3.5S** | | | 3.5 | - | | | |
| | **CST-5** | M5x0.8 | 10 | 18 | 13 | 90 | T25 | 5 |
| | **CST-5S** | | | 12 | 7 | | | |
| | **CSTF-2L055-S** | M2x0.4 | 2.7 | 5.5 | 3.8 | | T6 | 0.7 |

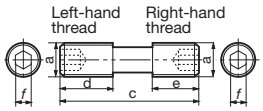
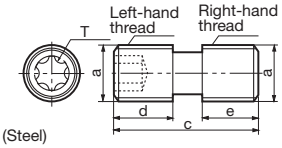
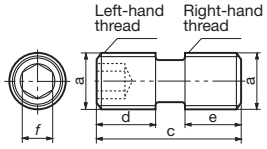
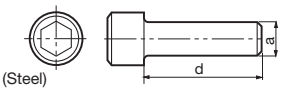
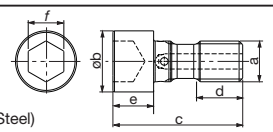
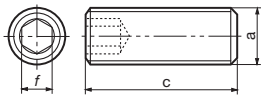
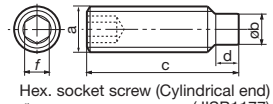
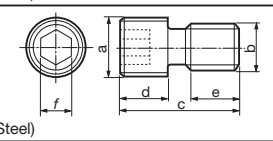
## Screws

| Shape | Designation | Dimension (mm) | | | | | | Torque (N·m) |
|---|---|---|---|---|---|---|---|---|
| | | a | øb | c | d | T / f | | |
|  Cross recessed head screw (Steel) | **SM2.5×0.45×8** | M2.5x0.45 | 5 | 8 | - | - | | - |
| | **SM2.5×0.5×8** | M2.5x0.5 | 5 | 8 | - | - | | - |
| | **SM3×0.5×6** | M3x0.5 | 6 | 6 | - | - | | - |
| | **SM3×0.5×8** | | | 8 | - | - | | - |
| | **SM3×0.5×10** | | | 10 | - | - | | - |
|  (Steel) | **MSP-5** | M5x0.8 | 6.1 | 7.9 | 4.9 | 2 | | 1.5 |
| | **MSP-6.3** | M6.3x1 | 7.7 | 12.7 | 9.9 | 2.5 | | 3 |
| | | | | | | | | |
|  (Steel) | **BHM3-8** | M3x0.5 | 5.5 | 10 | 8 | 2 | | 1.5 |
| | **BHM4-8** | M4x0.7 | 7 | 10.6 | | 2.5 | | 2.2 |
| | **BHM4-10** | | | 12.6 | 10 | | | |
| | **BHM5-14** | M5x0.8 | 9 | 17.6 | 14 | 3 | | 3 |
| | **BHM6-20-A** | M6x1.0 | 10.5 | 24 | 20 | 4 | | 5 |
| | **BHM8-25U** | M8 | 14 | 29.3 | 25 | 5 | | 8.5 |
| | **BHM8-30U** | | | 34.3 | 30 | | | |
|  (Steel) | **CSHM-3-8** | M3 | 6 | 8 | - | 2 | | 1.5 |
| | | | | | | | | |
|  (Steel) | **CSHB-4-A** | M4 | 5.5 | 11 | | T15 | | 2 |
| | **CSHB-6** | M6 | 8.5 | 19 | - | 4 | | 5 |
| | **CSHB-6-A** | M6 | 8.5 | 19 | | | | 5 |
| | | | | | | | | |
|  (Steel) | **RT-1** | M6 | 10 | 22.5 | 14 | 4 | | 5 |
| | **RT-2** | M8 | 13 | 31 | 20 | 5 | | 8.5 |
| | | | | | | | | |
|  (Steel) | **ASM6** | M6 | 10 | 18 | 12 | 3 | | - |
| | **AJM5F** | M5x0.5 | 9 | 13 | 8 | 2 | | - |
| | **AJM5** | M5x0.8 | 9 | 13 | 8 | 2 | | - |
| | | | | | | | | |
|  (Steel) | **ASM34S** | M3 | 4.8 | 8 | 5 | 2 | | - |
| | **ASM34L** | | | 11 | 8 | | | - |
| | **ASM54** | M5x0.8 | 9 | 14 | 9 | 3 | | - |
| | | | | | | | | |
|  (Steel) | **CHHM3.5-10** | M3.5x0.6 | 6 | 13.5 | 10 | 3 | | 3 |
| | **CHHM4-10** | M4x0.7 | 7 | 14 | | | | |
| | **CHHM5-14** | M5x0.8 | 8.5 | 19 | 14 | 4 | | 5 |
| | **CHHM5-18** | | | 23 | 18 | | | |
| | **CHHM6-15** | M6 | 10 | 21 | 15 | 5 | | 8.5 |
| | **CHHM6-20** | | | – | 20 | | | |
| | **CHHM6-25** | | | 31 | 25 | | | |
| | | | | | | | | |
|  Hex. socket head screw (JISB1176) | **CM3X0.5X6** | M3x0.5 | 5.5 | 9 | 6 | 2.5 | | 2.2 |
| | **CM3X0.5X10** | | | 13 | 10 | | | |
| | **CM4X0.7X10** | M4x0.7 | 7 | 14 | | 3 | | 3 |
| | **CM4X0.7X12** | | | 16 | 12 | | | |
| | **CM4X0.7X14** | | | 18 | 14 | | | |
| | **CM4X0.7X15** | | | 19 | 15 | | | |
| | **CM4X0.7X20** | | | 24 | 20 | | | |
| | **CM4X0.7X20-M0-A** | | 6 | 24 | 20 | | | |
|  **CM***H** (Steel) | **CM5X0.8X8** | M5x0.8 | 8.5 | 13 | 8 | 4 | | 5 |
| | **CM5X0.8X10-A** | | | 15 | 10 | | | |
| | **CM5X0.8X12** | | | 17 | 12 | | | |
| | **CM5X0.8X12-A** | | | 17 | 12 | | | |
| | **CM5X0.8X14** | | | 18 | 14 | | | |
| | **CM5X0.8X16** | | | 21 | 16 | | | |
| | **CM5X0.8X16-A** | | | 21 | 16 | | | |
| | **CM5X0.8X18** | | | 23 | 18 | | | |
| | **CM5X0.8X20-A** | | | 25 | 20 | | | |
| | **CM5X0.8X25-A** | | | 30 | 25 | | | |
| | **CM5X15** | M5 | | 20 | 15 | | | |

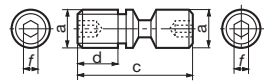
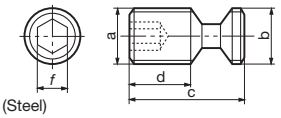
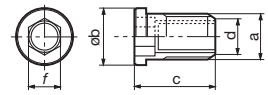
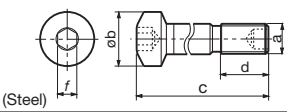
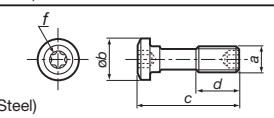
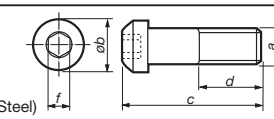
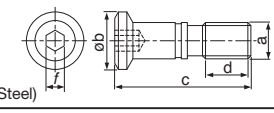
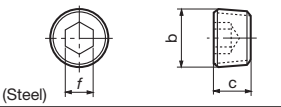
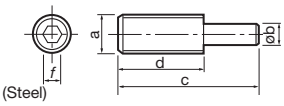
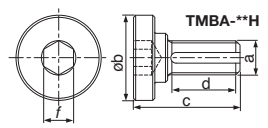
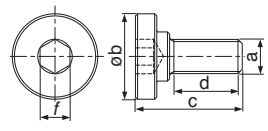
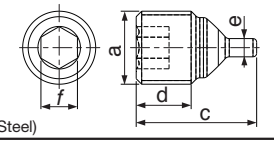
## Screws

| Shape | Designation | Dimension (mm) | | | | | | | Torque (N·m) |
|---|---|---|---|---|---|---|---|---|---|
| | | a | øb | c | d | e | f | g | |
|  Hex. socket head screw (JISB1176) | CM6X1X16-A | M6x1.0 | 10 | 22 | 16 | | 5 | | 8.5 |
| | CM6X1X20-A | | | 26 | 20 | | | | |
| | CM6X1X25-A | | | 31 | 25 | | | | |
| | CM6X1.0X40-A | | | 46 | 40 | | | | |
| | CM6X10 | M6 | | 16 | 10 | | | | |
| | CM6X15 | | | 21 | 15 | | | | |
| | CM6X16 | | | 22 | 16 | | | | |
| | CM6X20 | | | 26 | 20 | | | | |
| | CM6X25 | | | 31 | 25 | | | | |
| | CM6X30-S | M6x1.0 | 10 | 35.7 | 28 | | | | |
| | CM8X1.25X20-A | M8x1.25 | 13 | 28 | 20 | | 6 | | 25 |
| | CM8X1.25X25-A | | | 33 | 25 | | | | |
| | CM8X30H | | | 36 | 30 | | 5 | | |
| | CM10X30 | M10x1.5 | 16 | 30 | 20 | | 8 | | 40 |
| | CM10X30H | | 16 | 38 | 30 | | 6 | | 40 |
| | CM12X30H | M12x1.75 | 18 | 40 | | | 8 | | 70 |
| | CM16X40H | M16x2 | 24 | 54 | 40 | | 10 | | 100 |
| | CM16x75 | M16 | 24 | 75 | 51 | | 14 | | 100 |
| | CM16x120 | M16 | 24 | 120 | 96 | | 14 | | 100 |
| | CM16x140 | M16 | 24 | 140 | 116 | | 14 | | 100 |
|  CM***H | CM20x80 | M20 | 30 | 80 | 50 | | 17 | | 150 |
| | CM20x120 | M20 | 30 | 120 | 90 | | 17 | | 150 |
| | CM20x150 | M20 | 30 | 150 | 120 | | 17 | | 150 |
| | CAP-CM12x1.75x50 | M12 | 18 | 50 | 38 | | 10 | | 70 |
| | CAP-CM16X2.0X55 | M16 | 24 | 55 | 39 | | 14 | | 40 |
| | CAP-CM20X2.5X50 | M20 | 30 | 50 | 30 | | 17 | | 100 |
| | C0.375X1.125H | 3/8-24UNF | 14.27 | 38.11 | 28.58 | | 5.55 | | 35 |
| | C0.500X1.375H | 1/2-20UNF | 19.05 | 47.63 | 34.93 | | 7.94 | | 70 |
| | SD06-A3 | M10x1.5 | 16 | 70 | 60 | | 8 | | 40 |
| | SRM6X16DIN912-12.9 | M6x1 | 10 | 22 | 14.1 | | 5 | | |
| | VC00TEDI12040F | M12 | 26 | 51 | 40 | | 8 | | 60 |
| | VC00TEDI20040F | M20 | 49 | 50 | 34.5 | | 12 | | 150 |
| | VC00TANG16040F | M16 | 46 | 46.5 | 33 | | 10 | | 60 |
| | SD08-98 | M12x1.75 | 18 | 77 | 65 | | 10 | | 70 |
| | LHM12x1.75x30-C | M12 | 18 | 36.9 | 30 | | 8 | | 70 |
| | VC004762I10035F | M10 | 16 | 45 | 34.5 | | 8 | | 60 |
| (Steel) | FCS3 | M3x0.5 | 5.5 | 16 | 12 | | 2.5 | | |
| | FCS6 | M6x1 | 10 | 26 | 20 | | 5 | | |
|  (Steel) FSHM*-*H | FSHM8-30 | M8x1.25 | 11 | 30 | 27 | | 5 | | 25 |
| | FSHM8-30H | | | | | | | | 25 |
| | FSHM10-40 | M10 | 14 | 40 | 36.5 | | 6 | | 40 |
| | FSHM10-40H | | | | | | | | 40 |
| | | | | | | | | | |
|  (Steel) | SHCM4-10 | M4x0.7 | 6 | 14 | 10 | | 3 | | 3 |
| | SHCM4-12 | | | 16 | 12 | | | | |
| | SHCM4-16 | | | 20 | 16 | | | | |
| | | | | | | | | | |
|  (Steel) | CTS-M6 | M6x1 | 10 | 25 | 16.4 | | 4 | | 5 |
| | | | | | | | | | |
|  (Steel) | RSFTS-050M | M10 | 25 | 52 | 42.5 | | 6 | | |
| | | | | | | | | | |

## Screws

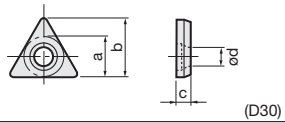
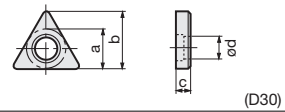
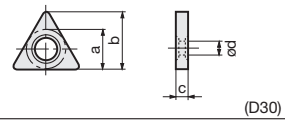
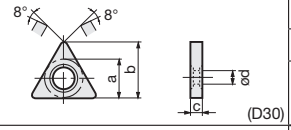
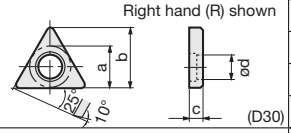
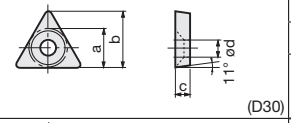
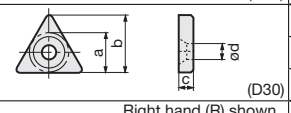
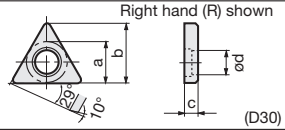
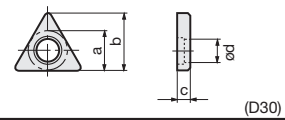
| Shape | Designation | Dimension (mm) | | | | | | Torque (N·m) |
|---|---|---|---|---|---|---|---|---|
| | | a | øb | c | d | e | T / f | |
|   (Steel) | **MCS520-2.5** | M5×0.8 | | 20 | 7 | 6 | 2.5 | 3 |
| | **MCS620-3** | M6×1 | | | | 7 | 3 | 6 |
| | **MCS625-3** | | | 25 | 10 | 8 | | |
| | **MCS825-4** | M8×1 | | | 12.5 | 6.5 | 4 | 8 |
| | **MCS828-4** | | | 28.5 | 12 | 10.5 | | |
| | **NDS-8A** | | | 30 | 11.5 | 11.5 | | |
| | **NDS-8S** | M8×1.25 | | 20 | 8 | 8 | | |
| | **RSRGR5M40** | M4 | | 9 | 3.67 | 4.17 | T8 | |
| | **SR PS 118-0273** | M10 | | 40 | 16.5 | 15 | 5 | 40 |
|   (Steel) | **DS-6T** | M6 | | 15 | 6 | 6 | | 3.5 |
| | **DS-6P** | M6×1 | | 21 | 7 | 7 | 15IP | 6 |
| | **FDS-8ST** | M8×1 | | 20 | 8 | 8 | T27 | 10 |
| | **FDS-8ST-18** | | | 18 | | 6 | | |
| | | | | | | | | |
|   (Steel) | **DS-6** | M6×1 | | 15 | 6 | 6 | 3 | 6 |
| | **DS-8** | M8×1.25 | | 16 | 7 | 7 | 4 | 8 |
| | **DS-8S** | | | 13 | 5.5 | 5.5 | | |
| | **DS-10** | M10×1.5 | | 26 | 10 | 12 | 5 | 8 |
| | **FDS-6Z** | M6×0.75 | | 20.5 | | 5.5 | 3 | 6 |
| | **FDS-8** | M8×1 | | 26 | | 10 | 4 | 8 |
| | **FDS-8S** | | | 20 | 8 | 8 | | |
| | **FDS-8SS** | | | 18.5 | | 6.5 | | |
|   (Steel) | **SS100** | 1/4-20 | | | 19.05 | | | |
| | **S-412** | 10-32 | | | 19.05 | | | |
| | | | | | | | | |
|   (Steel) | **SHM8x1.25x35-C** | M8 | 13 | 43 | 23 | 8 | 6 | 25 |
| | **SHM10x1.5x30-C** | M10 | 16 | 40 | 17 | 10 | 8 | 40 |
| | **SHM16x2x35-C** | M16 | 24 | 51 | 18 | 16 | 14 | 100 |
| | **SHM20x2.5x40-C** | M20 | 30 | 58 | 20 | 18 | 17 | 150 |
| Hex. socket screw (Flat end)(JISB1177)   | **SSHM2.5-3** | M2.5 | | 3 | | | 1.5 | 1 |
| | **SSHM3-3** | M3 | | 3 | | | | |
| | **SSHM3-4** | | | 4 | | | | |
| | **SSHM3-6** | | | 6 | | | | |
| | **SSHM4-4** | M4 | | 4 | | | 2 | 1.5 |
| | **SSHM4-5** | | | 5 | | | | |
| | **SSHM4-6** | | | 6 | | | | |
| | **SSHM4-8** | | | 8 | | | | |
| | **SSHM4-10** | | | 10 | | | | |
| | **SSHM4-14** | | | 14 | | | | |
| | **SSHM5-6** | M5 | | 6 | | | 2.5 | 2 |
| | **SSHM5-10** | | | 10 | | | | |
| | **SSHM5-16** | | | 16 | | | | |
| | **SSHM6-12** | M6 | | 12 | | | 3 | 3 |
| | **SSHM6-16** | | | 16 | | | | |
| | **SSHM6-18** | | | 18 | | | | |
| | **SSHM6-20** | | | 20 | | | | |
| | **SSHM8-8** | M8 | | 8 | | | 4 | 5 |
| | **SSHM8-10** | | | 10 | | | | |
| | **SSHM8-12** | | | 12 | | | | |
| | **SSHM8-14** | | | 14 | | | | |
| | **SSHM8-16** | | | 16 | | | | |
| (Steel) | **SSHM8-18** | | | 18 | | 14 | | |
|   Hex. socket screw (Cylindrical end) (Steel) (JISB1177) | **M5×7** | M5 | 3.5 | 7 | 1.25 | - | 2.5 | 2 |
| | **M5×8** | | | 8 | | - | | |
| | **M5×10** | | | 10 | | - | | |
| | **M6×30** | M6 | 4 | 30 | 1.5 | - | 3 | 3 |
|   (Steel) | **JDS-3525** | M3.5x0.35 | M2.5 x0.45 | 7.5 | 3 | 2.5 | 2 | 1 |
| | **JDS-5040** | M5x0.5 | M4 x0.7 | 10 | 4 | 4 | 2.5 | 1 |
| | | | | | | | | |

## Screws

| Shape | Designation | Dimension (mm) | | | | | | Torque (N·m) |
|---|---|---|---|---|---|---|---|---|
| | | a | b | c | d | e | T / f | |
|  LCS2 has a hex. socket in threaded end only. | LCS2 | M5 | 5 | 14 | 6.5 | | 2 | 1.5 |
| | LCS3 | M6 | 6 | 17 | | | 2.5 | 2 |
| | LCS3B | | | 15 | | | | |
| | LCS4 | M8 | 8 | 21 | | | 3 | 3 |
| | LCS4K | | | | 9.6 | | | |
| | LCS4CA | | | 17.5 | 6.5 | | | |
| | LCS5 | | | 25 | 8.5 | | | |
| | LCS5CA | | | 20.5 | | | | |
| (Steel) | LCS6 | M10 | 9.8 | 27.2 | 9.9 | | 4 | 5 |
| | LCS8 | M12 | 11.8 | 36 | 12.8 | | 5 | 8 |
| | LCS8C | M10 | 9.8 | 30.2 | 13.3 | | 4 | 5 |
|  (Steel) | LCS22 | M5 | M5 | 10 | 4.7 | | 2 | 1.5 |
| | LCS22A | M6 | M6 | 10.7 | | | | |
| | LCS23A | M5 | M5 | 13.1 | 5.1 | | 2.5 | 2 |
| | LCS33 | M5 | M5 | 12 | 6.2 | | 2 | 1.5 |
| | LCS43 | M6 | M6 | 13.5 | 7.3 | | 2.5 | 2 |
|  (Steel) | DTS5-3.5 | M5 | 6.3 | 8.65 | M3.5 | | 3.5 | 4 |
| | DTS5-3.5SS | | | 6.8 | | | | |
| | DTS5-3.5S | | | 7 | | | | |
| | DTS6-4 | M6 | 7.7 | 10.2 | M4 | | 4 | 5 |
| | DTS6-4.5 | | 7.5 | 10 | M4.5 | | 4.5 | 5 |
|  (Steel) | DLCS33 | M5 | 9 | 31.5 | 10 | | 3 | 3 |
| | DLCS43 | M6 | 12 | 34 | 9.5 | | 4 | 5 |
| | DLCS54 | M8x1 | 14 | 41 | 11 | | | 7 |
| | DLCS64 | M10x1 | 16 | 50 | 15 | | 5 | 8 |
|  (Steel) | ACS-5W | M5 | 8 | 20 | 8.5 | | T15 | 4 |
| | ACS-6W | M6 | 10 | 26 | 12.1 | | T20 | 6.4 |
| | | | | | | | | |
|  (Steel) | ACS3 | M5x0.8 | 7.5 | 25.6 | 12-15 | | 3 | 4 |
| | ACS4 | M6x1 | 9 | 27.7 | 14-17 | | 4 | 7 |
| | | | | | | | | |
|  (Steel) | WCS3 | M6 | 9.5 | 22.5 | 8 | | 3 | 3 |
| | | | | | | | | |
|  (Steel) | PT1/4GN | | 13.175 | 10 | - | | 6 | 9.5 |
| | 1/8-28 | | 9.728 | 7 | - | | 5 | 8 |
| | | | | | | | | |
| | | | | | | | | |
|  (Steel) | LS-8 | M8 | 6 | 33 | 20 | | 4 | 5 |
| | | | | | | | | |
| (Steel) | CCS4-A | | | | | | | |
| | BH5-10-A | | | | | | | |
| | BH4-10-A | | | | | | | |
| | BH-40050-A | | | | | | | |
|  TMBA-**H  (Steel) | TMBA-M10 | M10x1.5 | 27 | 30 | 21 | | 8 | 40 |
| | TMBA-M12 | M12x1.75 | 33 | 36 | 26 | | 10 | 70 |
| | TMBA-M12H | M12x1.75 | | 34.5 | | | 8 | |
| | TMBA-M16 | M16x2 | 40 | 50 | 40 | | 14 | 100 |
| | TMBA-M16H | M16x2 | | | | | | |
| | TMBA-M20 | M20x2.5 | 50 | 56 | 42 | | 17 | 150 |
| | TMBA-M20H | M20x2.5 | | | | | | |
| | TMBA-M24 | M24x3 | 65 | 69 | 55 | | 19 | 150 |
| | TMBA-M24H | M24x3 | | | | | | |
| | TMBA-0.500H | 1/2-20UNF | 33 | 33.9 | 25.4 | | 7.94 | 70 |
| | TMBA-0.750H | 3/4-16UNF | 50 | 58.28 | 47.28 | | 12.7 | 150 |
|  (Steel) | SR-10400611 | M4X0.5 | | 6.6 | 3 | 1 | 2 | |
| | | | | | | | | |

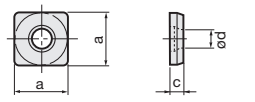
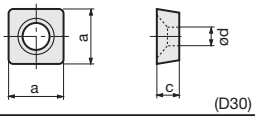
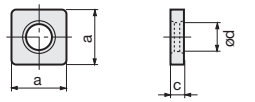
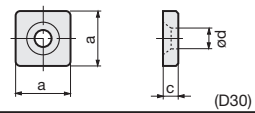
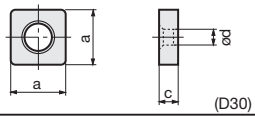
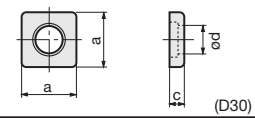
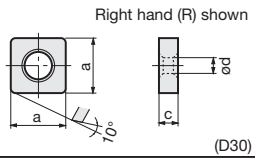
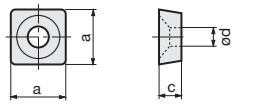
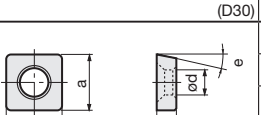
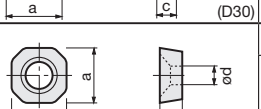
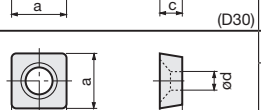
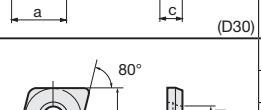
# User's Guide- Parts for Tool

## Shims

| Shape | Designation | Dimension (mm) | | | | |
|---|---|---|---|---|---|---|
| | | a | b | c | ød | |
|  (D30) | **AST322** | 9.3 | 13.2 | 3.2 | 4.4 | |
| | **AST422** | 12.5 | 18 | 3.2 | 4.4 | |
|  (D30) | **MST-322** | 9.1 | 12.9 | 3.24 | 5.8 | |
| | **MST-432** | 12.5 | 17.9 | 4.8 | 7.3 | |
| | **MST-533** | 15.6 | 22.2 | | 9.7 | |
| | **MST-644** | 18.8 | 26.6 | 6.4 | 11.3 | |
|  (D30) | **LST317** | 9.3 | 13.2 | 2.7 | 5 | |
| | **LST42** | 12.5 | 18 | 3.2 | 6.7 | |
| | **LST53** | 15.7 | 22.3 | 4.8 | 7.7 | |
| | **LST42K** | 10.9 | 15.6 | 3.2 | 6.7 | |
|  (D30) | **LST317CA** | 9.3 | 13.2 | 2.7 | 5 | |
| | **LST42CA** | 12.5 | 18 | 3.2 | 6.7 | |
| Right hand (R) shown  (D30) | **ELST42** | 11.5 | 16.5 | 3.2 | 6.5 | |
| | **ELST317** | 8.5 | 12 | 2.7 | 4.9 | |
| | **ELST317BR** | | | | | |
| | **ELST317BL** | | | | | |
|  (D30) | **PAT-32** | 8.2 | 11.7 | 3.2 | 3.5 | |
| | **PAT-53*** | 13.4 | 19.8 | 4.8 | 5 | |
|  (D30) | **NAT-32** | 9.5 | 13.4 | 3.2 | 3.5 | |
| | **NAT-42E** | 12.4 | 17.8 | 3.2 | 3.1 | |
| Right hand (R) shown  (D30) | **LST317BR** | 9.3 | 13.2 | 2.7 | 5 | |
| | **LST317BL** | | | | | |
|  (D30) | **SST32** | 8.5 | 11.9 | 3.2 | 5.4 | |

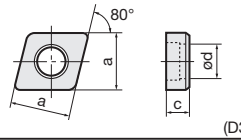
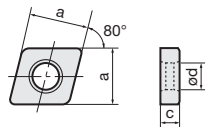
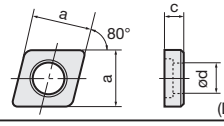
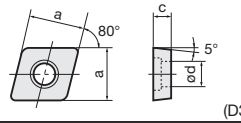
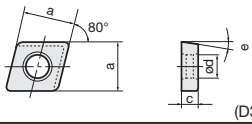
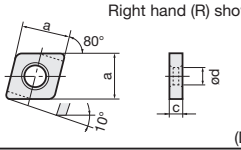
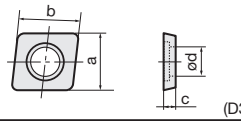
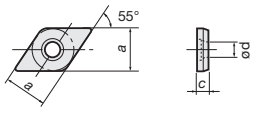
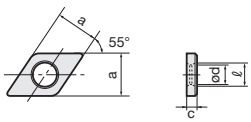
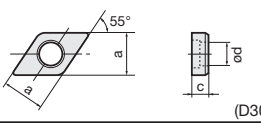
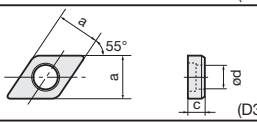
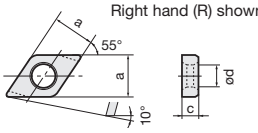
Note: * marked shims are made of steel.

## Shims

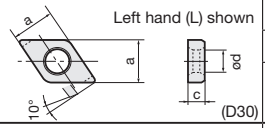
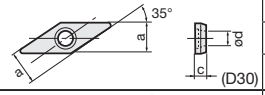
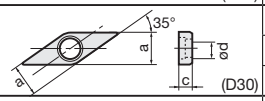
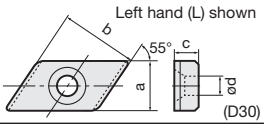
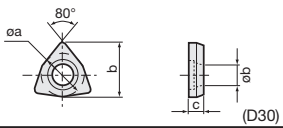
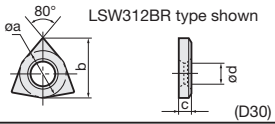
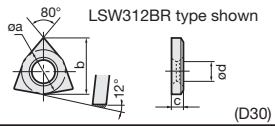
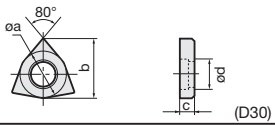
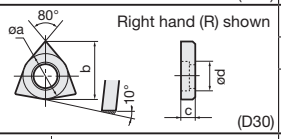
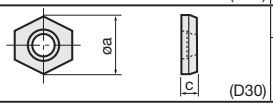
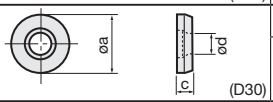
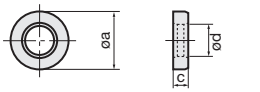
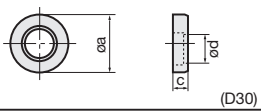
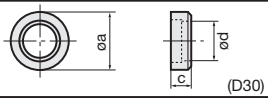
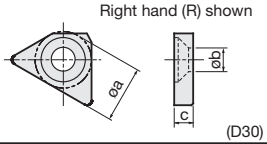
| Shape | Designation | Dimension (mm) | | | | |
|---|---|---|---|---|---|---|
| | | a | b | c | ød | e |
|  (D30) | **ASS422** | 12.5 | | 3.2 | 4.4 | |
| | **CS44-A** | 12.5 | | 4.7 | | |
|  (D30) | **ASS533** | 15.7 | | 4.8 | 5.5 | |
| | **ASS634** | 18.9 | | | | |
|  (D30) | **ELSS32** | 8.5 | | 3.2 | 4.9 | |
| | **LSS33** | 9.3 | | 4.3 | 5 | |
| | **ELSS42** | 11.7 | | 3.2 | 6.5 | |
| | **LSS42** | 12.5 | | 3.2 | 6.7 | |
| | **ELSS53** | 14.7 | | 4.8 | 8 | |
| | **LSS53** | 15.7 | | | 7.7 | |
| | **ELSS63** | 17.9 | | | 9.7 | |
| | **LSS63** | 18.9 | | | | |
| | **ELSS84** | 24.2 | | 6.4 | 12.9 | |
| | **LSS84** | 25.2 | | 6.4 | 13.1 | |
|  (D30) | **NAS-42** | 12.7 | | 3.2 | 3.5 | |
| | **NAS-04** | 31.5 | | 6.4 | 9.1 | |
|  (D30) | **MSS-432** | 12.5 | | 4.8 | 7.3 | |
| | **MSS-442** | | | 6.4 | | |
|  (D30) | **SSS32** | 8.5 | | 3.2 | 5.4 | |
| | | | | | | |
| Right hand (R) shown  (D30) | **LSS42BR** | 12.5 | | 3.2 | 6.7 | |
| | **LSS42BL** | | | | | |
|  (D30) | **PAS-32** | 8.2 | | 3.2 | 3 | |
| | **PAS-42** | 11.4 | | | 3.5 | |
| | **PAS-63*** | 17 | | 4.8 | 5 | |
|  (D30) | **LSS42CA** | 12.5 | | 3.2 | 6.7 | 8° |
| | **LSS53CA** | 15.7 | | 4.8 | 7.7 | 10° |
|  (D30) | **FSSA1102** | 11.6 | | 2 | 5.5 | 13° |
|  (D30) | **FSSP1102** | 11 | | 2 | 5.5 | 17° |
|  (D30) | **ASC322** | 9.3 | | 3.2 | 4.4 | |
| | **ASC422** | 12.5 | | 3.2 | 4.4 | |
| | **ASC533** | 15.7 | | 4.8 | 5.5 | |
| | **ASC634** | 18.9 | | | | |
| | **CC44-A** | 12.5 | | 4.7 | | |

Note: * marked shims are made of steel.

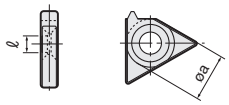
## Shims

| Shape | Designation | Dimension (mm) | | | | |
|---|---|---|---|---|---|---|
| | | a | b | c | ød | e |
|  (D30) | **MSC-432** | 12.5 | | 4.8 | 7.3 | |
| | **MSC-442** | | | 6.4 | | |
| | **MSC-533** | 15.6 | | 4.8 | 9.7 | |
| | **MSC-543** | | | 6.4 | | |
| | **MSC-634** | 18.8 | | | 11.3 | |
|  (D30) | **ELSC32** | 8.5 | | 3.2 | 6.2 | |
| | **LSC42** | 12.5 | | | 6.5 | |
| | **ELSC42** | 11.7 | | | | |
| | **LSC53** | 15.7 | | 4.8 | 7.7 | |
| | **ELSC53** | 14.7 | | | 8.1 | |
| | **ELSC63** | 17.9 | | | 9.7 | |
| | **LSC63** | 18.9 | | | | |
| | **LSC317** | 9.3 | | 2.7 | 5 | |
|  (D30) | **SSC32** | 8.5 | | 3.2 | 5.4 | |
| | **SSC4T3** | 11.4 | | 4 | 6.6 | |
| | | | | | | |
|  (D30) | **SSC4T3-P** | 11.4 | | 4 | 6.6 | |
| | **SSC54-P** | 13.4 | | | | |
| | | | | | | |
|  (D30) | **LSC42CA** | 12.5 | | 3.2 | 6.7 | 8° |
| | **LSC53CA** | 15.7 | | 4.8 | 7.7 | 10° |
| | | | | | | |
| Right hand (R) shown  (D30) | **LSC42BR** | 12.5 | | 3.2 | 6.7 | |
| | **LSC42BL** | | | | | |
| | | | | | | |
|  (D30) | **ZSA1102** | 10.5 | 11 | 2 | 5.475 | |
| | **ZSA1502** | 15.6 | 12.4 | | 6 | |
| | | | | | | |
|  (D30) | **ASD322** | 9.3 | | 3.2 | 4.4 | |
| | **ASD423** | 12.5 | | 3.2 | 4.4 | |
| | **ASD432** | 12.5 | | 4.8 | 4.4 | |
| | **CD44-A** | 12.5 | | 4.7 | | |
| | | | | | | |
|  (D30) | **ELSD32** | 8.5 | | 3.2 | 4.9 | |
| | **ELSD42** | 11.7 | | | 6.5 | |
| | **LSD42** | 12.5 | | | 6.7 | |
| | **LSD42A** | | | | | |
| | **LSD43** | | | 4.8 | | |
| | **LSD43A** | | | | | |
|  (D30) | **MSD-322** | 9.3 | | 3.2 | 5.8 | |
| | **MSD-432** | 12.5 | | 4.8 | 7.3 | |
| | **MSD-442** | | | 6.4 | | |
| | | | | | | |
|  (D30) | **SSD32** | 8.5 | | 3.2 | 5.4 | |
| | | | | | | |
| Right hand (R) shown  (D30) | **ELSD317BR** | 8.5 | | 2.7 | 4.9 | |
| | **ELSD317BL** | | | | | |
| | **LSD42BR** | 12.5 | | 3.2 | 6.7 | |
| | **LSD42BL** | | | | | |
| | | | | | | |

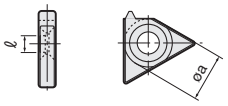
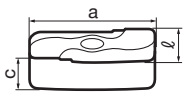
## Shims

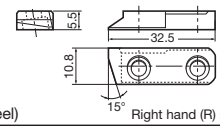
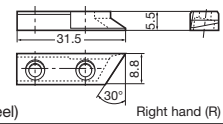
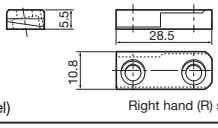
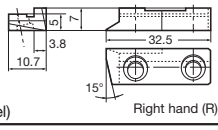
| Shape | Designation | Dimension (mm) | | | | |
|---|---|---|---|---|---|---|
| | | øa | b | c | ød | |
|  Left hand (L) shown (D30) | **LSZ42BR** | 12.5 | | 3.2 | 6.7 | |
| | **LSZ42BL** | | | | | |
| | | | | | | |
|  (D30) | **ASV322** | 9.3 | | 3.2 | 4.4 | |
| | **CV34-A** | 9.3 | | 4.7 | | |
| | | | | | | |
|  (D30) | **MSV-322** | 9.26 | | 3.2 | 5.8 | |
| | **SSV32** | 8.4 | | | 5.4 | |
| | **SSV42** | 11 | | | 6.3 | |
|  Left hand (L) shown (D30) | **CSK54R** | 9.4 | 14.8 | 4.8 | 3.5 | |
| | **CSK54L** | | | | | |
| | | | | | | |
|  (D30) | **ASW322** | 9.33 | 11.5 | 3.2 | 4.4 | |
| | **ASW422** | 12.5 | 15.2 | | | |
| | | | | | | |
|  LSW312BR type shown (D30) | **LSW312** | 9.33 | 11.5 | 2.7 | 5 | |
| | **LSW42** | 12.5 | 15.5 | 3.2 | 6.7 | |
| | | | | | | |
|  LSW312BR type shown (D30) | **LSW312BR** | 9.33 | 11.5 | 2.7 | 5 | |
| | **LSW312BL** | | | | | |
| | | | | | | |
|  (D30) | **MSW-432** | 12.8 | 15.8 | 4.8 | 7.3 | |
| | **MSW-533** | 16 | 19.7 | | 9.7 | |
| | **MSW-633** | 19.2 | 23.7 | | 11.3 | |
| | | | | | | |
|  Right hand (R) shown (D30) | **MSW-432BR** | 12.8 | 15.8 | 4.8 | 7.3 | |
| | **MSW-432BL** | | | | | |
| | | | | | | |
|  (D30) | **CH44-A** | 12.5 | | 4.7 | | |
| | | | | | | |
|  (D30) | **ASR420** | 12.5 | | 3.2 | 4.4 | |
| | | | | | | |
|  (D30) | **LSR32** | 8.9 | | 3.2 | 5 | |
| | **LSR32C** | 8.4 | | | | |
| | **LSR42** | 12.1 | | | 6.7 | |
| | **LSR42C** | 9.9 | | | 5 | |
| | **LSR53C** | 14 | | 4.8 | 6.7 | |
| | **LSR63C** | 17.2 | | | 8.2 | |
| | **LSR84C** | 21.9 | | 6.4 | 9.7 | |
|  (D30) | **MSR-43** | 12.5 | | 4.8 | 7.3 | |
| | **MSR-44** | | | 6.4 | | |
| | | | | | | |
|  (D30) | **SSR32** | 8.7 | | 3.18 | 5.2 | |
| | | | | | | |
| Right hand (R) shown  (D30) | **G16EL/IR** | 9.5 | - | 3.2 | 4 | |
| | **G16ER/IL** | | | 3.2 | | |
| | **G16EL/IR-DT** | | | 3.97 | 5.4 | |
| | **G16ER/IL-DT** | | | 3.97 | | |
| | | | | | | |

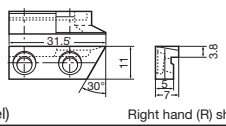
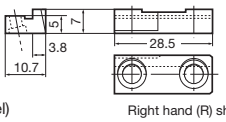
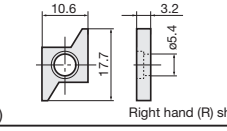
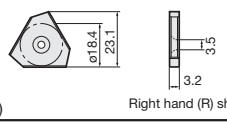
## Shims

| Shape | Designation | Dimension (mm) | | |
|---|---|---|---|---|
| | | øa | ød | Lead angle |
|  | AE16-4DT | 9.5 | 5.4 | 4° |
| | AE16-3DT | | 5.4 | 3° |
| | AE16-2DT | | 5.4 | 2° |
| | A16-1DT | | 5.4 | 1° |
| | AE16-0DT | | 5.4 | 0° |
| | AE16-99DT | | 5.4 | -1° |
| | AE16-98DT | | 5.4 | -2° |
| | AE16-4 | | 4 | 4° |
| | AE16-3 | | 4 | 3° |
| | AE16-2 | | 4 | 2° |
| | A16-1 | | 4.3 | 1° |
| | AE16-0 | | 4 | 0° |
| | AE16-99 | | 4 | -1° |
| | AE16-98 | | 4 | -2° |
| | AN16-4DT | 9.5 | 5.4 | 4° |
| | AN16-3DT | | 5.4 | 3° |
| | AN16-2DT | | 5.4 | 2° |
| | AN16-0DT | | 5.4 | 0° |
| | AN16-99DT | | 5.4 | -1° |
| | AN16-98DT | | 5.4 | -2° |
| | AN16-4 | | 4 | 4° |
| | AN16-3 | | 4 | 3° |
| | AN16-2 | | 4 | 2° |
| | AN16-0 | | 4 | 0° |
| | AN16-99 | | 4 | -1° |
| | AN16-98 | | 4 | -2° |
| | GXE16-98 | 9.5 | 4 | -2° |
| | GXE16-98DT | | 5.4 | -2° |
| | GXE16-99 | | 4 | -1° |
| | GXE16-99DT | | 5.4 | -1° |
| | GXE16-0 | | 4 | 0° |
| | GXE16-0DT | | 5.4 | 0° |
| | GXE16-1 | | 4.3 | 1° |
| | GX16-1DT | | 5.4 | 1° |
| | GXE16-2 | | 4 | 2° |
| | GXE16-2DT | | 5.4 | 2° |
| | GXE16-3 | | 4 | 3° |
| | GXE16-3DT | | 5.4 | 3° |
| | GXE16-4 | | 4 | 4° |
| | GXE16-4DT | | 5.4 | 4° |
| | GXE22-98DT | 12.7 | 6.6 | -2° |
| | GXE22-99DT | | | -1° |
| | GXE22-0DT | | | 0° |
| | GX22-1DT | | | 1° |
| | GXE22-2DT | | | 2° |
| | GXE22-3DT | | | 3° |
| | GXE22-4DT | | | 4° |
| | GXN16-98 | 9.5 | 4 | -2° |
| | GXN16-98DT | | 5.4 | -2° |
| | GXN16-99 | | 4 | -1° |
| | GXN16-99DT | | 5.4 | -1° |
| | GXN16-0 | | 4 | 0° |
| | GXN16-0DT | | 5.4 | 0° |
| | GXN16-1 | | 4.3 | 1° |
| | GXN16-2 | | 4 | 2° |
| | GXN16-2DT | | 5.4 | 2° |
| | GXN16-3 | | 4 | 3° |
| | GXN16-3DT | | 5.4 | 3° |
| | GXN16-4 | | 4 | 4° |
| | GXN16-4DT | | 5.4 | 4° |
| | GXN22-98DT | 12.7 | 6.6 | -2° |
| | GXN22-99DT | | | -1° |
| | GXN22-0DT | | | 0° |
| | GXN22-2DT | | | 2° |
| | GXN22-3DT | | | 3° |
| (D30) | GXN22-4DT | | | 4° |

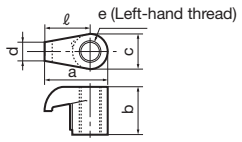
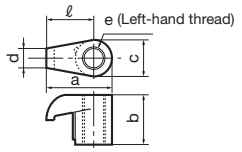
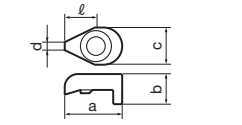
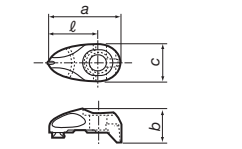
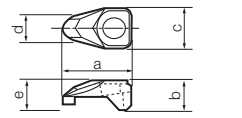
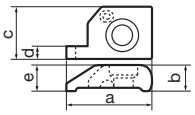
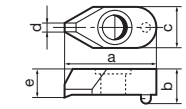
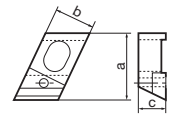
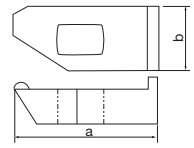
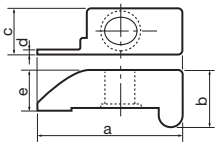
## Shims

| Shape | Designation | Dimension (mm) | | |
|---|---|---|---|---|
| | | a | ℓ | Lead angle |
|  | NXE22-98 | 12.7 | 4 | -2° |
| | NXE22-99 | | | -1° |
| | NXE22-0 | | | 0° |
| | NXE22-1 | | 4.5 | 1° |
| | NXE22-2 | | 4 | 2° |
| | NXE22-3 | | | 3° |
| | NXE22-4 | | | 4° |
| | NXE27-98 | 15.9 | 4 | -2° |
| | NXE27-99 | | | -1° |
| | NXE27-0 | | | 0° |
| | NXE27-1 | | 4.5 | 1° |
| | NXE27-2 | | 4 | 2° |
| | NXE27-3 | | | 3° |
| | NXE27-4 | | | 4° |
| | NXN22-98 | 12.7 | 4 | -2° |
| | NXN22-99 | | | -1° |
| | NXN22-0 | | | 0° |
| | NXN22-1 | | 4.5 | 1° |
| | NXN22-2 | | 4 | 2° |
| | NXN22-3 | | | 3° |
| | NXN22-4 | | | 4° |
| | NXN27-98 | 15.9 | 4 | -2° |
| | NXN27-99 | | | -1° |
| | NXN27-0 | | | 0° |
| | NXN27-1 | | 4.5 | 1° |
| | NXN27-2 | | 4 | 2° |
| | NXN27-3 | | | 3° |
| (D30) | NXN27-4 | | | 4° |
|  | TSL12R | 12 | 4.7 | 4.5° |
| | TSL12L | 12 | 4.7 | 4.5° |
| | TSL16R | 15.9 | 6.4 | 5° |
| | TSL16L | 15.9 | 6.4 | 5° |
| | TSL24R | 23.8 | 9.4 | 7° |
| | TSL24L | 23.8 | 9.4 | 7° |
| | TSL12RI | 10.7 | 4.7 | 4.5° |
| | TSL12LI | 10.7 | 4.7 | 4.5° |
| | TSL16RI | 18.8 | 6.4 | 5° |
| (D30) | TSL16LI | 18.8 | 6.4 | 5° |

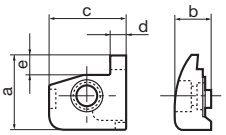
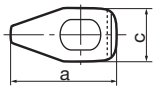
| Shape | Designation |
|---|---|
|  (Steel) Right hand (R) shown | SL-1R |
| | SL-1L |
|  (Steel) Right hand (R) shown | SL-2R |
| | SL-2L |
|  (Steel) Right hand (R) shown | SL-3R |
| | SL-3L |
|  (Steel) Right hand (R) shown | SL-6R |
| | SL-6L |

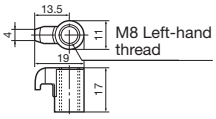
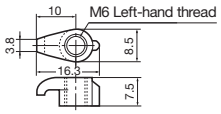
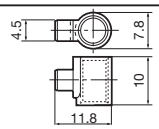
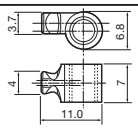
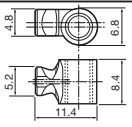
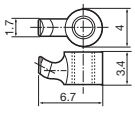
| Shape | Designation |
|---|---|
|  (Steel) Right hand (R) shown | SL-7R |
| | SL-7L |
|  (Steel) Right hand (R) shown | SL-8R |
| | SL-8L |
|  (D30) Right hand (R) shown | SGSR151 |
| | SGSL151 |
|  (D30) Right hand (R) shown | STN62R |
| | STN62L |

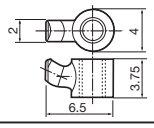
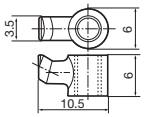
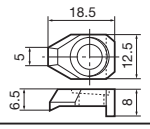
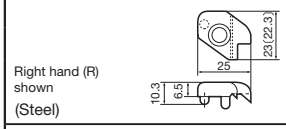
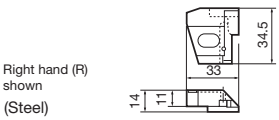
## Clamps

| Shape | Designation | Dimension (mm) | | | | | |
|---|---|---|---|---|---|---|---|
| | | a | b | c | d | e | ℓ |
|  e (Left-hand thread) (Steel) | **MCL-5M** | 14.7 | 11 | 7.8 | 4 | M5 | 10.8 |
| | **MCL-6** | 18.6 | 11.5 | 9.5 | | M6 | 13.8 |
| | **MCL-8S** | 19.1 | 13.5 | 10.9 | 5 | M8 | 13.6 |
| | **MCL-8M** | 22.5 | | | | | 17 |
| | **MCL-8L** | 25.5 | 14.5 | | 4 | | 20 |
|  e (Left-hand thread) (Steel) | **MCPM-6** | 14.7 | 11.2 | 7.9 | 4 | M5 | 10.8 |
| | **MCPM-9** | 19.1 | 16.8 | 10.9 | 5 | M8×1 | 13.6 |
| | **MCPM-12** | 22.5 | | | | | 17 |
| | **MCPM-20** | 18.6 | 9.5 | 9.5 | 4 | M6 | 13.8 |
| | **MCPM-21** | | 12.2 | | | | |
| | **MCPM-22** | 21.5 | 13.2 | | | | 16.7 |
| | **MCPM-30** | 25.5 | 16.8 | 10.9 | 5 | M8×1 | 20 |
|  (Steel) | **DCPM-33** | 16 | 9.3 | 10.5 | 2.4 | | 8.5 |
| | **DCPM-43** | 21.2 | 11.5 | 13.5 | 3 | | 13.2 |
| | **DCPM-54** | 25.8 | 15.25 | 14 | 3.5 | | |
| | **DCPM-64** | 28.4 | 15.5 | 16 | 4 | | |
|  (Steel) | **ACP3S** | 22.8 | 9.5 | 10 | | | 15 |
| | **ACP3S-E** | 21.7 | 9.5 | 10 | | | 13.9 |
| | | | | | | | |
| | **ACP4S** | 25.7 | 12 | 13 | | | 17.7 |
| | **ACP5S** | 30.1 | 12.9 | 15 | - | - | 20.7 |
| | **ACP6S** | 33.4 | 12.8 | 16.5 | - | - | 24 |
|  (Steel) | **ACP3** | 17.9 | 10 | 10 | 6.5 | 6.3 | |
| | **ACP4** | 25.9 | 13.9 | 12 | 7 | 10.8 | |
| | | | | | | | |
|  Right hand (R) shown (Steel) | **CTC-3R** | 29 | 8.8 | 16 | 2.2 | 8 | |
| | **CTC-3L** | | | | | | |
| | **CTC-4R** | | | 17 | 3.2 | | |
| | **CTC-4L** | | | | | | |
| | **CTC-5R** | | | 18 | 4.2 | | |
| | **CTC-5L** | | | | | | |
|  (Steel) | **CP81A** | 28 | 10.5 | 12 | 3.5 | 8 | |
| | **CP81B** | | | | | | |
| | | | | | | | |
|  TC-3 type shown, TC-4 : Left-hand thread (Steel) | **TC-3** | 19 | 12.5 | 8.3 | – | – | – |
| | **TC-4** | 21.6 | | 8 | | | |
| | | | | | | | |
|  (Steel) | **TF-72** | 22 | 5.78 | | | | |
| | **TF-73** | 22 | 11.3 | | | | |
| | **TF-184** | 22 | 11.3 | | | | |
| | | | | | | | |
|  (Steel) | **CCR2** | 34.7 | 14.9 | 10.7 | 1.2 | 10.5 | |
| | **CCL2** | | | | | | |
| | **CCR3** | | | | 2.2 | | |
| | **CCL3** | | | | | | |
| | **CCR4** | | | | 2.8 | | |
| | **CCL4** | | | | | | |
| | **CCR5** | | | | 3.2 | | |
| | **CCL5** | | | | | | |
| | **CCR6** | | | | 3.9 | | |
| | **CCL6** | | | | | | |
| | **CCR8** | | | | 4.9 | | |
| | **CCL8** | | | | | | |

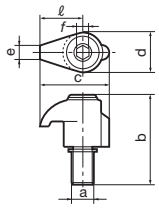
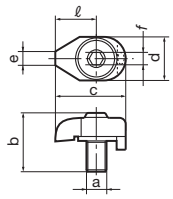
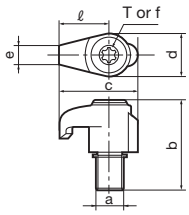
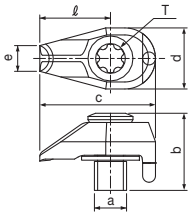
## Clamps

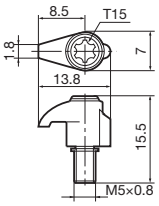
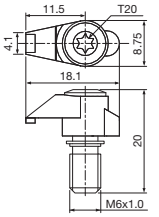
| Shape | Designation | Dimension (mm) | | | | | |
|---|---|---|---|---|---|---|---|
| | | a | b | c | d | e | |
|  Right hand (R) shown | CFG-3SR | 22 | 11 | 23.1 | 2 | 6 | |
| | CFG-3SL | | | | | | |
| | CFG-4SR | | | | 3 | | |
| | CFG-4SL | | | | | | |
| | CFG-4DR | 32 | | | | 16 | |
| | CFG-4DL | | | | | | |
| | CFG-5SR | 22 | | | 4 | 6 | |
| | CFG-5SL | | | | | | |
| | CFG-5DR | 32 | | | | 16 | |
| | CFG-5DL | | | | | | |
| | CFG-6SR | 23 | | | 5 | 7 | |
| | CFG-6SL | | | | | | |
| | CFG-6DR | 33 | | | | 17 | |
| | CFG-6DL | | | | | | |
| | CFG-8SR | 28 | | 27.1 | 7 | 8 | |
| | CFG-8SL | | | | | | |
| | CFG-8DR | 38 | | | | 18 | |
| (Steel) | CFG-8DL | | | | | | |
|  (Steel) | CCP4-A | 29.1 | | 14 | | | |
| | | | | | | | |

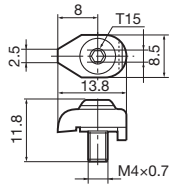
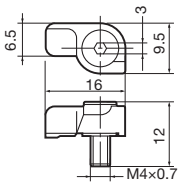
| Shape | Designation |
|---|---|
|  (Steel) | NF-84A |
|  (Steel) | CP536 |
|  (Steel) | CP91 |
|  (Steel) | CP900 |
|  (Steel) | CP910 |
|  (Steel) | JCP-1 |

| Shape | Designation |
|---|---|
|  (Steel) | JCP-2 |
|  (Steel) | JCP-3<br>JCP-3N |
|  (Steel) | CQ-1 |
|  Right hand (R) shown (Steel) | CPK5R<br>CPK5L |
|  Right hand (R) shown (Steel) | C11R-5<br>C11L-5 |

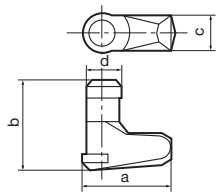
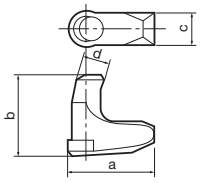
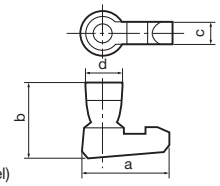
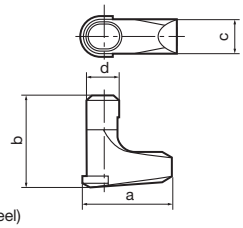
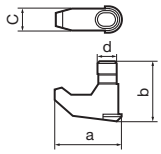
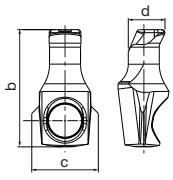
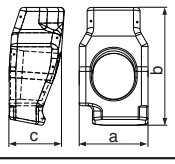
## Clamp Sets

| Shape | Designation | Dimension (mm) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | a | b | c | d | e | ℓ | T / f |
|  (Steel) | **CSG-5S** | M5×0.8 | 13.5 | 13.8 | 7 | 1.8 | 8.5 | 2.5 |
| | **CSG-5** | | 15.5 | | | | | |
| | **CSG-6S** | M6×1 | | 16.3 | 8.5 | 2.5 | 10 | 3 |
| | **CSG-6** | | 18 | | | | | |
| | **CSG-6L** | | 21.5 | | | | | |
| | **CSG-8S** | M8×1 | 21 | 20.5 | 11 | 3.5 | 12.5 | 4 |
| | **CSG-8** | | 23.5 | | | | | |
|  (Steel) | **CSW-00** | M4×0.7 | 11.5 | 12 | 8 | 2 | 7.5 | 2.5 |
| | **CSW-1** | M5×0.8 | 16.5 | 16.5 | 9.5 | 4 | 10 | 3 |
| | **CSW-0** | M4×0.7 | 11.5 | 13.8 | 8.5 | 2.5 | 8 | 2.5 |
| | **CSW-2** | M6×1 | 20 | 20.5 | 11 | 6 | 13 | 4 |
| | **CSW-40** | M4×0.7 | 12 | 13.2 | 8 | 2 | 7.5 | 2.5 |
| | **CSW-50** | M5×0.8 | 15 | 16.9 | 10 | | 9.5 | 3 |
| | | | | | | | | |
|  (Steel) | **CSP 16** | M5×0.8 | 15.5 | 14.4 | 6.9 | 3.2 | 9.1 | T15 |
| | **CSP 22** | M6×1 | 20 | 18.1 | 8.9 | 4.2 | 11.5 | T20 |
| | **CSP 27** | M8×1 | 23.5 | 24.4 | 11.9 | 3.9 | 15.6 | 4 |
| | | | | | | | | |
|  (Steel) | **CSY-15** | M4×0.7 | 11.6 | 11.5 | 7 | 3 | 6 | 15IP |
| | **CSY-20** | M5×0.8 | 12 | 18 | 9.5 | 4 | 11 | 20IP |
| | | | | | | | | |

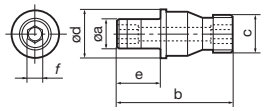
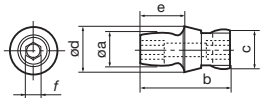
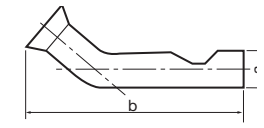
| Shape | Designation |
|---|---|
|  (Steel) | **CSG-5T** |
| | |
|  (Steel) | **CSX20** |
| | |

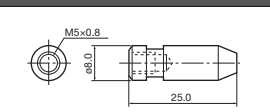
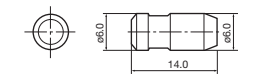
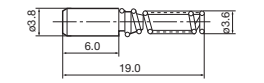
| Shape | Designation |
|---|---|
|  (Steel) | **CSW-0T** |
| | |
|  (Steel) | **CSL-4** |
| | |

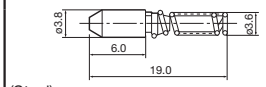
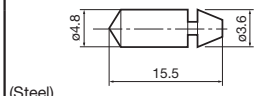
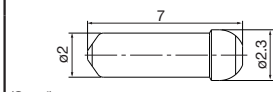
## Levers

| Shape | Designation | Dimensions (mm) | | | | |
|---|---|---|---|---|---|---|
| | | a | b | c | d | |
|  (Steel) | **LCL3** | 10 | 12 | 3.7 | 3.6 | |
| | **LCL4** | 14.6 | 14 | 4.7 | 4.7 | |
| | **LCL5** | 17.1 | 17 | 6 | 6 | |
| | **LCL6** | 20.5 | 21 | 7.5 | 7.5 | |
| | **LCL8** | 25.4 | 25.4 | 8.6 | 8.6 | |
| | | | | | | |
|  (Steel) | **LCL3C** | 10.8 | 11.8 | 3.4 | 3 | |
| | **LCL4C** | 13 | 13.4 | 3.7 | 3.4 | |
| | **LCL5C** | 18.6 | 17.7 | 4.7 | 4.5 | |
| | **LCL6C** | 20.5 | 19 | 6 | 5.7 | |
| | **LCL8C** | 24.2 | 23.5 | 7.5 | 6.2 | |
| | | | | | | |
|  (Steel) | **LCL22N** | 7.5 | 6.5 | 2.6 | 2.06 | |
| | **LCL32N** | 10 | 7.8 | 3.2 | 3.2 | |
| | **LCL33NL** | 11.5 | 9.5 | 3.1 | 3.6 | |
| | **LCL33N** | 10 | 9.4 | 3.2 | 3.2 | |
| | **LCL43N** | 13.4 | 10 | 4.7 | 4.7 | |
| | | | | | | |
|  (Steel) | **LCL23** | 7.8 | 8.5 | 2.6 | 2.1 | |
| | **LCL33** | 10.1 | 12.1 | 3.6 | 3.7 | |
| | **LCL33L** | 12 | 11.5 | 3.1 | 3.6 | |
| | **LCL43S** | 13.5 | 13.2 | 4.7 | 4.7 | |
| | **LCL43M** | | | | | |
| | **LCL44** | 16.1 | 14.6 | 4.7 | 4.7 | |
| | **LCL54** | 16.5 | 17.2 | 6.1 | 6 | |
| | | | | | | |
|  (Steel) | **DLCL43** | 15.55 | 14 | 5 | 4.7 | |
| | **DLCL54** | 19.1 | 19.1 | 6.1 | 6 | |
| | **DLCL64** | 21.5 | 21 | 7.5 | 7.5 | |
| | | | | | | |
|  (Steel) | **SLLV-1** | | 7.75 | 3.4 | 2.43 | |
| | **SLLV-2** | | 7.75 | 3.4 | 2.75 | |
| | | | | | | |
|  (Steel) | **FCL4** | 5 | 7.78 | 3.81 | | |
| | **FCL8** | 10 | 14.3 | 5.39 | | |
| | | | | | | |

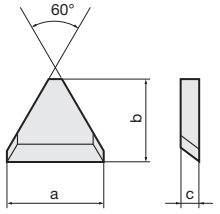
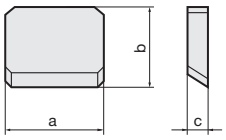
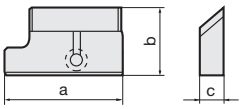
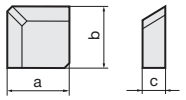
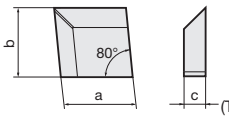
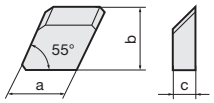
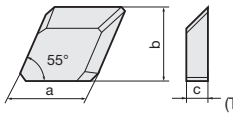
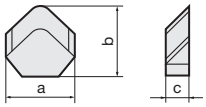
## Pins

| Shape | Designation | Dimension (mm) | | | | | |
|---|---|---|---|---|---|---|---|
| | | øa | b | øc | ød | e | f |
|  (Steel) | **MLP32L** | 3.9 | 8.8 | M5×0.8 | 5.6 | 3.5 | 2 |
| | **MLP33** | 3.7 | | | | | |
| | **MLP34L** | 3.7 | 13.1 | | 6.2 | 5 | |
| | **MLP46** | 5 | 17.2 | M6.3×1 | 7.8 | 5.5 | 2.5 |
| | **MLP46L** | | 18.6 | | | 6.9 | |
| | **MLP58** | 6.2 | 21.9 | M8×1 | 10.3 | | 3 |
| | **MLP68** | 7.8 | | M10×1 | 11.9 | | 4 |
| | **MLP68L** | | 24.1 | | | 9.1 | |
|  (Steel) | **MLP44** | 5 | 13.2 | M6.3×1 | 7.1 | 5.5 | 2.5 |
| | **MLP33L** | 3.7 | 10.4 | M5×0.8 | 5.6 | 5.1 | 2 |
| | | | | | | | |
|  (Steel) | **SW99** | 8 | 47.5 | | | | |
| | | | | | | | |

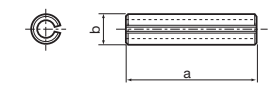
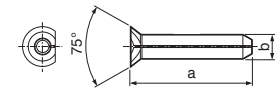
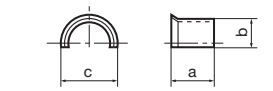
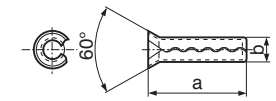
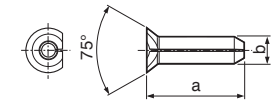
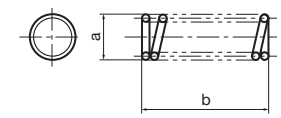
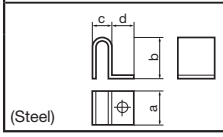
| Shape | Designation |
|---|---|
|  (Steel) | **SP-8** |
| | |
|  (Steel) | **SP-6** |
| | |
|  (Steel) | **BP-3** |
| | |

| Shape | Designation |
|---|---|
|  (Steel) | **BP-360** |
| | |
|  (Steel) | **BP-490** |
| | |
|  (Steel) | **SL-PI-2** |
| | |

## Chipbreaker Pieces

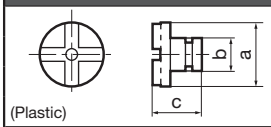
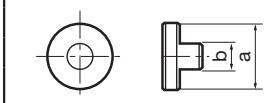
| Shape | Designation | Dimension (mm) | | | | |
|---|---|---|---|---|---|---|
| | | a | b | c | | |
|  (TX30) | **CBT-2S** | 8.8 | 7.6 | 2 | | |
| | **CBT-2M** | 7.4 | 6.6 | | | |
| | **CBT-3S** | 13.3 | 12.1 | 2.5 | | |
| | **CBT-3M** | 12.3 | 11.1 | | | |
| | **CBT-3L** | 11.3 | 10.1 | | | |
| | **CBT-4S** | 18.8 | 16.9 | | | |
| | **CBT-4M** | 17.8 | 15.9 | | | |
| | **CBT-4L** | 16.8 | 14.4 | | | |
| | **NCT-2S** | 14.2 | 11.8 | | | |
| | **NCT-2M** | 13 | 10.8 | | | |
| | **NCT-2L** | 11.9 | 9.8 | | | |
|  (TX30) | **CBS-3S** | 9.5 | 8.3 | 2 | | |
| | **CBS-3M** | | 7.3 | | | |
| | **CBS-4S** | 12.7 | 11.6 | 2.5 | | |
| | **CBS-4SN** | | | | | |
| | **CBS-4M** | | 10.6 | | | |
| | **CBS-4L** | | 9.1 | | | |
| | **NCS-3S** | | 11.2 | | | |
| | **NCS-3M** | | 10.2 | | | |
| | **NCS-3L** | | 8.7 | | | |
|  Right hand (R) shown (TX30) | **B11 R-5** | 24 | 13 | 5 | | |
| | **B11 L-5** | | | | | |
| | | | | | | |
|  (TX30) | **CBS-4SN** | 11.5 | 11.5 | 2.5 | | |
| | **CBS-4MN** | 10.5 | 10.5 | | | |
| | **CBS-4LN** | 9 | 9 | | | |
| | **NCS-3SN** | 11.2 | 11.2 | | | |
| | **NCS-3MN** | 10.2 | 10.2 | | | |
| | **NCS-3LN** | 8.7 | 8.7 | | | |
|  (TX30) | **CBC-4SN** | 11.5 | 11.5 | 2.5 | | |
| | **CBC-4MN** | 10.5 | 10.5 | | | |
| | **CBC-4LN** | 9.5 | 9.5 | | | |
| | | | | | | |
|  Right hand (R) shown (TX30) | **CBD-4SR** | 12.7 | 11.5 | 2.5 | | |
| | **CBD-4MR** | | 10.5 | | | |
| | **CBD-4ML** | | | | | |
| | **CBD-4LR** | | 9.5 | | | |
| | | | | | | |
|  (TX30) | **CBD-4SN** | 11.5 | 11.5 | 2.5 | | |
| | **CBD-4MN** | 10.5 | 10.5 | | | |
| | | | | | | |
|  (TX30) | **CBR-4SN** | 12.7 | 11.9 | 2.5 | | |
| | **CBR-4MN** | | 10.9 | | | |
| | | | | | | |

## Springs (Springs for Shims)

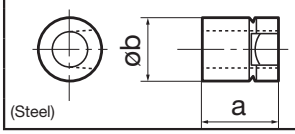
| Shape | Designation | Dimension (mm) | | | | | |
|---|---|---|---|---|---|---|---|
| | | a | b | c | d | | |
|  (Steel) | **SP-2.5** | 12 | 2.7 | | | | |
|  (Steel) | **SP-16-L14** | 13.6 | 2.85 | | | | |
|  (Steel) | **LSP3** | 5.5 | 3 | 5.9 | | | |
| | **LSP3L** | 7 | | | | | |
| | **LSP4** | | 4 | 7.6 | | | |
| | **LSP4S** | 6 | | | | | |
| | **LSP5** | 8.5 | 4.5 | 8.8 | | | |
| | **LSP6** | 11 | 5.9 | 10.9 | | | |
| | **LSP6C** | 8.5 | 4.8 | 9.3 | | | |
| | **LSP8** | 12 | 10 | 15.4 | | | |
|  (Steel) | **PSP-2.5** | 10 | 2.7 | | | | |
| | **PSP-4.0** | 16 | 4.2 | | | | |
| | **PSP301** | 7.6 | 3 | | | | |
| | | | | | | | |
|  (Steel) | **PSP-16** | 9.75 | 2.85 | | | | |
|  (Steel) | **BP-0** | 3.6 | 13 | | | | |
| | **BP-5-A** | | | | | | |
| | **BP-7** | 7 | 11 | | | | |
| | **BP-8.8** | 8.8 | 10 | | | | |
| | **BP-9** | 8.3 | | | | | |
| | **BP-10** | 9.1 | | | | | |
| | **SP913** | 9 | 13 | | | | |
|  (Steel) | **BSP-1** | 7.8 | 7.5 | 4.8 | 6 | | |

# User's Guide- Parts for Tool

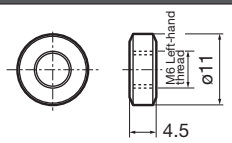
## Coolant Supply Attachment

| Shape | Designation | Dimension (mm) | | | | | |
|---|---|---|---|---|---|---|---|
| | | a | b | c | Thread | | |
|  (Plastic) | **EA-20** | 20 | 10 | 15 | | | |
| | **EA-25** | 25 | | | | | |
| | **EA-32** | 32 | 16 | | | | |
| | | | | | | | |
|  (Plastic) | **CA-16** | 16 | 8 | | M6 | | |
| | **CA-20** | 20 | 8.5 | | M6 | | |
| | **CA-25** | 25 | 11.5 | | R1/8 | | |
| | **CA-32** | 32 | 11.5 | | R1/8 | | |
| | **CA-40** | 40 | 11.5 | | R1/8 | | |

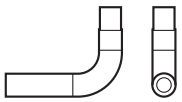
## Pistons

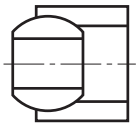
| Shape | Designation | Dimension (mm) | | | | |
|---|---|---|---|---|---|---|
| | | a | øb | | | |
|  (Steel) | **DPIS33** | 12.6 | 9 | | | |
| | **DPIS43** | 11.8 | 10 | | | |
| | **DPIS44** | 13.4 | 10 | | | |
| | **DPIS54** | 16 | 13 | | | |
| | **DPIS64** | | 15 | | | |

## Nuts

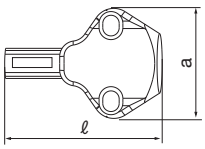
| Shape | Designation |
|---|---|
|  | **SRW11** |

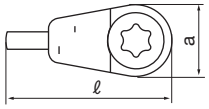
## Coolant Pipe & Nozzle

| Shape | Designation |
|---|---|
|  | **PNZ5** |

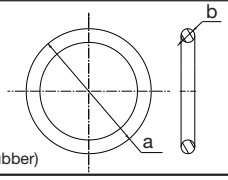
| Shape | Designation |
|---|---|
|  | **CNZ125** |

## Coolant unit

| Shape | Designation | Dimension (mm) | |
|---|---|---|---|
| | | a | ℓ |
|  | **CU-CW-CHP** | 20.8 | 29.7 |
| | **CU-D-CHP** | 20.8 | 29.6 |
| | **CU-V-CHP** | 20.8 | 30 |
| | | | |

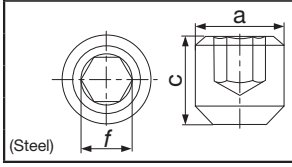
| Shape | Designation | Dimension (mm) | |
|---|---|---|---|
| | | a | ℓ |
|  | **S-CU-CHP** | 7 | 16.2 |
| | | | |

## O-ring for TungTurn-Jet

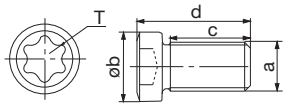
| Shape | Designation | Dimension (mm) | | | | |
|---|---|---|---|---|---|---|
| | | a | øb | | | |
|  (Rubber) | **OR6.4X0.9N** | 8.2 | 0.9 | | | |
| | **OR14X2.5NN** | 19 | 2.5 | | | |
| | | | | | | |

# User's Guide- Parts for Tool

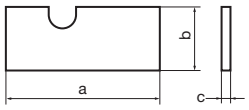
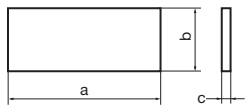
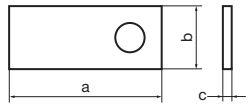
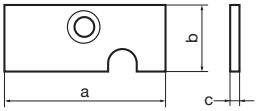
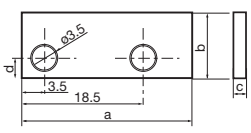
## Coolant screw for TungTurn-Jet

| Shape | Designation | Dimension (mm) | | | | |
|---|---|---|---|---|---|---|
| | | a | c | | | T / *f* |
|  (Steel) | **SRM4X4 TL360** | M4 | 4 | | | 2 |

## Mounting screw for TungTurn-Jet

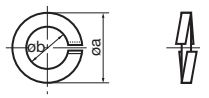
| Shape | Designation | Dimension (mm) | | | | |
|---|---|---|---|---|---|---|
| | | a | øb | c | d | T / *f* |
|  (Steel) | **SR M3** | M3X0.5 | 4.2 | 7 | 4.9 | T8 |

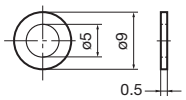
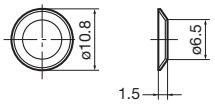
## Sizing Plates

| Shape | Designation | Dimension (mm) | | | | | |
|---|---|---|---|---|---|---|---|
| | | a | b | c | d | | |
|  (Steel) | **S0816A** | 55 | 15.5 | 0.8 | | | |
| | **S1016A** | | | 1 | | | |
| | **S0816B** | 50 | | 0.8 | | | |
| | **S1016B** | | | 1 | | | |
| | **S0816C** | 45 | | 0.8 | | | |
| | **S1016C** | | | 1 | | | |
| | **S0820A** | 61 | 19.5 | 0.8 | | | |
| | **S1020A** | | | 1 | | | |
| | **S0820B** | 54.5 | | 0.8 | | | |
| | **S1020B** | | | 1 | | | |
| | **SM-00** | 18 | 8 | 1 | | | |
|  (Steel) | **SW04** | 25.5 | 5.8 | 0.25 | | | |
| | | | | 0.5 | | | |
| | | | | 1 | | | |
| | **SW05** | 37 | 8.3 | 0.25 | | | |
| | **SW06** | 36 | 10.8 | 0.5 | | | |
| | | | | 1 | | | |
| | **SW08** | 35.5 | 12.3 | 2 | | | |
|  (Steel) | **S0810** | 40 | 11 | 0.8 | | | |
| | **S1010** | | | 1 | | | |
| | | | | | | | |
|  Attached with fix screw and wrench. (Steel) | **PSTR08** | 24 | 11 | 1.5 | | | |
| | **PSTL08** | | | | | | |
| | **PSTR10** | 42 | 16.5 | 2 | | | |
| | **PSTL10** | | | | | | |
| | **PSTR12** | 47 | 19 | 2 | | | |
| | **PSTL12** | | | | | | |
|  (Steel) | **AP0801** | 26 | 9.5 | 0.5 | 3 | | |
| | **AP0802** | | | 1 | | | |
| | **AP0803** | | | 1.5 | | | |
| | **AP0804** | | | 2 | | | |
| | **AP0805** | | | 2.5 | | | |
| | **AP1101** | 30 | 11.5 | 0.5 | 5 | | |
| | **AP1102** | | | 1 | | | |
| | **AP1103** | | | 1.5 | | | |
| | **AP1104** | | | 2 | | | |
| | **AP1105** | | | 2.5 | | | |
| | **AP1106** | | | 3 | | | |

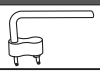
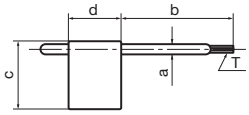
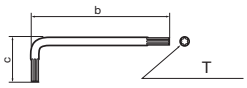
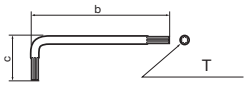
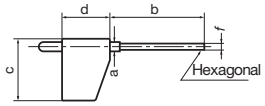
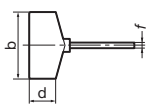
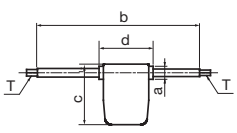
SW04 is composed of three plates and SW05 to SW08 are composed of four plates.
Note on fixing screws: PSTR/L08 is attached with CSSM2-4 and other types are attached with CSHM3-8.

## Washers

| Shape | Designation | Dimension (mm) | | | | | |
|---|---|---|---|---|---|---|---|
| | | øa | øb | | | | |
|  | **VA4** | | | | | | |
| | **VA5** | | | | | | |
| | **VA6** | 10.5 | 6.1 | | | | |
| | | | | | | | |

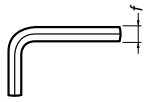
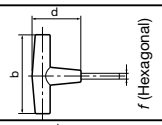
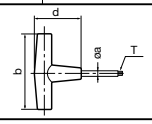
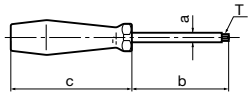
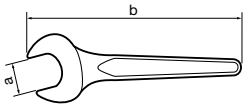
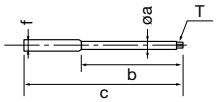
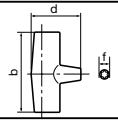
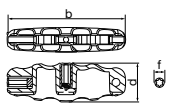
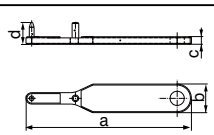
| Shape | Designation |
|---|---|
|  | **CPW5** |
| | |
|  | **CDW6** |
| | |

## Wrenches and Drivers

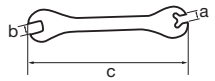
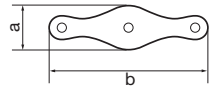
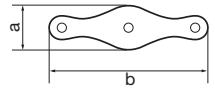
| Shape | Designation | Dimension (mm) | | | | | |
|---|---|---|---|---|---|---|---|
| | | a | b | c | d | *f* | T |
|  | **CRW23** | | | | | | |
| | **CRW33** | | | | | | |
|  | **T-6F** | 1.7 | 34.5 | 15 | 15 | | T6 |
| | **T-7F** | 2 | | 19 | 19 | | T7 |
| | **T-8F** | 2.3 | 39 | | | | T8 |
| | **T-9F** | 2.5 | 42.5 | | | | T9 |
| | **T-15F** | 3.3 | 45 | 27 | 22 | | T15 |
| | **T-20F** | 3.9 | 49 | 30 | | | T20 |
| | **IP-6F** | 1.7 | 34.5 | 15 | 15 | | 6IP |
| | **SET T-15/5** | 4 | 38 | | 15 | | |
|  | **T-6L** | | 48 | 16 | | | T6 |
| | **T-8L** | | | | | | T8 |
| | **T-9L** | | | | | | T9 |
| | **T-15L** | | 59 | 22 | | | T15 |
|  | **KEYV-T20** | | 60 | 22 | | | T20 |
| | **KEYV-T25** | | 65 | 23 | | | T25 |
| | **KEYV-T30L** | | 190 | 37 | | | T30 |
| | **KEYV-T40L** | | 208 | 43 | | | T40 |
| | **KEYV-T50L** | | 232 | 48 | | | T50 |
|  | **P-2F** | 4 | 44 | 20 | 12.5 | 2 | |
| | **P-2.5F** | 5 | 45 | 25 | 20 | 2.5 | |
| | **HW2.0/5RED** | 3 | 38 | 15 | 15 | 2 | |
| | | | | | | | |
|  | **P-2.5T** | | 42 | | 15 | 2.5 | |
| | | | | | | | |
|  | **T-1008/5** | 6.5 | 85 | 28 | 25 | - | T10/T8 |
| | **T-2010/5** | 6.5 | 85 | 28 | 25 | - | T10/ T20 |
| | | | | | | | |

# User's Guide- Parts for Tool

## Wrenches, Drivers and Lubricant

| Shape | Designation | Dimension (mm) | | | | | |
|---|---|---|---|---|---|---|---|
| | | a | b | c | d | *f* | T |
|  | **1/4HEX** | | | | | 6.35 | |
| | **5/32HEX** | | | | | 3.96 | |
| | **P-2** | | | | | 2 | |
| | **P-2.5** | | | | | 2.5 | |
| | **P-3** | | | | | 3 | |
| | **P-3.5** | | | | | 3.5 | |
| | **P-4** | | | | | 4 | |
| | **P-4.5** | | | | | 4.5 | |
| | **P-5** | | | | | 5 | |
| | **P-6** | | | | | 6 | |
|  | **TP-3A** | | 70 | | 45.5 | 3 | |
| | **TP-4** | | 85 | | 53 | 4 | |
| | **TP-5** | | | | | 5 | |
| | | | | | | | |
|  | **T-15T** | 5 | 65 | | 45 | | T15 |
| | **T-20T** | | | | | | T20 |
| | **T-27T** | | 85 | | 42 | | T27 |
| | **IP-20T** | 5 | 80 | | 45 | | 20IP |
|  Handle shape somewhat varies depending on the type number from the above figure. | **T-6D** | 2.5 | 45 | 70 | | | T6 |
| | **T-7D** | 2 | | | | | T7 |
| | **T-8D** | 2.6 | 61 | 67.5 | | | T8 |
| | **T-9D** | 3 | 65 | 80 | | | T9 |
| | **T-10D** | 3.3 | 70 | 90 | | | T10 |
| | **T-15D** | 3.65 | 71 | 100 | | | T15 |
| | **T-20D** | 4.6 | 90 | | | | T20 |
| | **T-25D** | 4.4 | 87 | 86 | | | T25 |
| | **IP-6DB** | | 45 | 70 | | | 6IP |
| | **IP-7D** | 2.6 | 45 | 70 | | | 7IP |
| | **IP-8D** | 2.8 | 56 | 69 | | | 8IP |
| | **IP-10D** | 3.3 | 71 | 89 | | | 10IP |
| | **IP-15D** | 3.9 | 70 | 100 | | | 15IP |
| | **IP-20D** | 4.6 | 90 | 100 | | | 20IP |
|  | **KS-21** | 21 | 195 | | | | |
| | **KS-24** | 24 | 215 | | | | |
| | **KS-27** | 27 | 235 | | | | |
| | **KS-32** | 32 | 275 | | | | |
| | **KS-36** | 36 | 305 | | | | |
|  | **M-1000** | | | | | | |
| | | | | | | | |
|  | **BT15S** | 3.9 | 50 | 90 | | 6 | T15 |
| | **BT15M** | 3.9 | 50 | 118 | | 6 | T15 |
| | **BT20S** | 4.6 | 50 | 90 | | 6 | T20 |
| | **BT20M** | 4.6 | 50 | 118 | | 6 | T20 |
| | **BLD IP15/S7** | 3.9 | 50 | 90 | | 6 | 15IP |
| | **BLD IP15/M7** | 3.9 | 50 | 118 | | 6 | 15IP |
| | **BLD IP20/S7** | 4.6 | 50 | 90 | | 6 | 20IP |
| | **BLD IP20/M7** | 4.6 | 50 | 118 | | 6 | 20IP |
| | **BLD T10/S7** | | | | | | |
|  | **H-TB** | | 100 | | 37 | 6 | |
| | **H-TBS** | | 75 | | 37 | 6 | |
| | | | | | | | |
|  | **H-TB2W** | | 95 | | 31.4 | 6 | |
| | | | | | | | |
|  | **ECW-456EF** | 87 | 15 | 4 | 11.5 | | |
| | **ECW-456I** | 80.5 | 22 | 4 | 10.5 | | |
| | | | | | | | |

## Wrenches and Drivers

| Shape | Designation | Dimension (mm) | | | | | |
|---|---|---|---|---|---|---|---|
| | | a | b | c | d | *f* | T |
|  | **KEYV-S05** | 4 | 5.5 | 100 | | | |
| | **KEYV-S06** | 5.4 | 8 | 125 | | | |
| | **KEYV-S08** | 6.6 | 10 | 150 | | | |
| | **KEYV-S10** | 7.7 | 13 | 175 | | | |
| | **KEYV-S12** | 9.4 | 16 | 250 | | | |
| | **KEYV-W20** | | | | | | |
|  | **KEYV-177** | 29 | 110 | | | | |
| | **KEYV-217** | 29 | 110 | | | | |
| | | | | | | | |
|  | **KGDT-100** | 32 | 108.5 | | | | |
| | **KGDT-110** | 32 | 108.5 | | | | |
| | **KGDT-120** | 32 | 108.5 | | | | |
| | **KGDT-130** | 32 | 108.5 | | | | |
| | **KGDT-140** | 32 | 108.5 | | | | |
| | **KGDT-150** | 32 | 108.5 | | | | |

## Locators

| Designation | Applicable Tool |
|---|---|
| **LD150R** | TXD15125R ~ TXD15315R |
| **LD440R/L** | TMD44<br>TGD4400R/L-A<br>TFD44 |
| **LD442R/L** | EGD4400R |
| **LD540R/L** | TMD54 |
| **LE302R** | ESE3050R (RS**) ~ 3063R (RS**) |
| **LE303R/L** | TSE3003R/LIA ~ 3006R/LIA |
| **LE402AR** | ESE4050RA<br>ESE4063RA |
| **LE403R/L** | TSE4003R/LIA<br>TSE4004R/LIA<br>ESE4003RIA-S32 |
| **LE405R/L** | TSE4005R/LIA ~ 4012R/LIA |
| **LE413R/L** | THE40 |
| **LE444R/L** | TME4403R/LI ~ 4405R/LI<br>TME4403R/LB ~ 4405R/LB<br>EME4405R ~ 4404RI |
| **LE446R/L** | TME4406R/LI ~ 4412R/LI<br>TME4406R/LB ~ 4412R/LB |
| **LE540R/L** | TME54 |
| **LF440R/L** | THF44 |
| **LF540R/L** | THF54 |
| **LF602R** | ERF6050R ~ ERF6063R |
| **LF602R/L** | TRF6003R/LI ~ TRF6006R/LI<br>TRF6008R/LI ~ TRF6012R/LI |
| **LMS56R/L** | MS08R/L ~ MS12R/L |
| **LN423R/L** | TGN42 |
| **LN645R/L** | TPN64 |
| **LP403R/L** | TSP4003R/LIA ~ TSP4004R/LIA<br>TFP4004R/LIA |
| **LP405R/L** | TSP4005R/LIA ~ TSP4012R/LIA<br>TFP4005R/LIA ~ TFP4012R/LIA |
| **LP413R/L** | TGP41<br>TGP42 |
| **LP514R/L** | TGP51 |
| **LPP16R** | TPP16 |
| **LR602R/L** | ERD6050RA ~ ERD6063RA |
| **LR603R/L** | TRD6003R/L<br>TRD6004R/L ~ TRD6008R/L |
| **LV525R/L** | VSN 1 |
| **LV530R/L** | VSN 2 |
| **LV556R/L** | VSN60 |
| **LW400R** | EFP4063R |
| **LW400R/L** | TFD44<br>TFP4000<br>SFP4000 |
| **LW402R** | EFP4050R |

## Insert locking wedges

| Designation | Applicable Tool |
|---|---|
| **FDS-8SST** | EDPD09063R<br>EDPD09063RB |
| **FDS-8ST-18** | EDP09080R<br>EDPD09080RB<br>DPD09100R~DPD09160R<br>DPD09100RB~DPD09160RB |
| **FW-242R/L** | ø63 |
| **FW-243R/L** | ø80~100 |
| **FW-245R/L** | ø125 ~ |
| **FW304R/L-D** | DAD15<br>DPD15<br>EDPD15<br>QPP15 |
| **LE302R** | ESE3050R (RS**) ~ 3063R (RS**) |
| **WF150R** | TXD15125R ~ TXD15315R |
| **WF310R/L** | TGP4100BA<br>TGP4103R/LIA |
| **WF330N** | TSE4003R/LIA<br>TSE4004R/LIA<br>ESE4003RIA-S32<br>TSP4003R/LIA ~ TSP4004R/LIA<br>TFP4004R/LIA |
| **WF330R/L** | TSE3003R/LIA ~ 3006R/LIA |
| **WF444R/L** | TME4403R/LI ~ 4405R/LI<br>TME4403R/LB ~ 4405R/LB<br>EME4405R ~ 4404RI<br>TME4406R/LI ~ 4412R/LI<br>TME4406R/LB ~ 4412R/LB |
| **WF500R** | TSE4005R/LIA ~ 4012R/LIA<br>TSP4005R/LIA ~ TSP4012R/LIA<br>TFP4005R/LIA ~ TFP4012R/LIA |
| **WF500R/L** | TMD54<br>TGP51<br>THF54 |
| **WF50R/L** | TME54 |
| **WF602R** | ERF6050R ~ ERF6063R |
| **WF603R/L** | TRF6003R/LI ~ TRF600R/LI |
| **WF608R/L** | TRF6008R/LI ~ TRF6012R/LI |
| **WN645R/L** | TPN64 |
| **WP193TR/L** | EGD4400R |
| **WP440R/L** | TMD44<br>TGD4400R/L-A<br>TFD44<br>TGP4100IA ~ TGP4112R/LIA<br>TGP42<br>THF44<br>THE40 |
| **WR602R/LW** | ERD6050RA ~ ERD6063RA |
| **WR603R/L** | TRD6003R/L<br>TRD6004R/L ~ TRD6008R/L |
| **WT402R** | ESE4050RA<br>ESE4063RA |
| **WT402R/L** | EME4450RB ~ 4404RB |

## Locator adjusting wedges

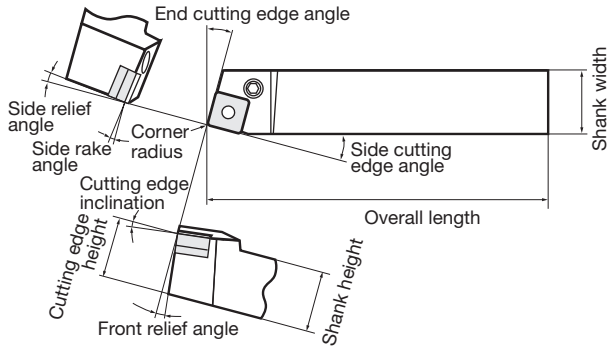
| Designation | Applicable Tool |
|---|---|
| **FW-305** | TFD44<br>TFP40<br>SFP4000<br>EFP4063 |
| **FW325R/L-D** | DAD15<br>QPP15<br>DPD15<br>EDPD15 |

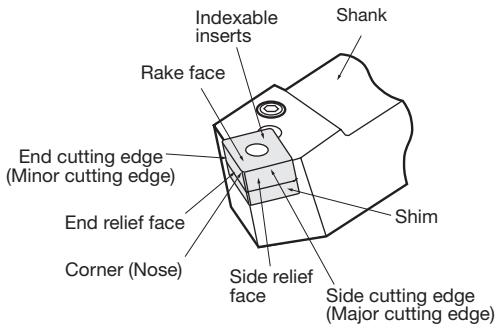
## Fine adjusting screws

| Designation | Applicable Tool |
|---|---|
| **AJM5** | DPD09<br>EDPD09 |
| **ASM34L** | DPD24 |

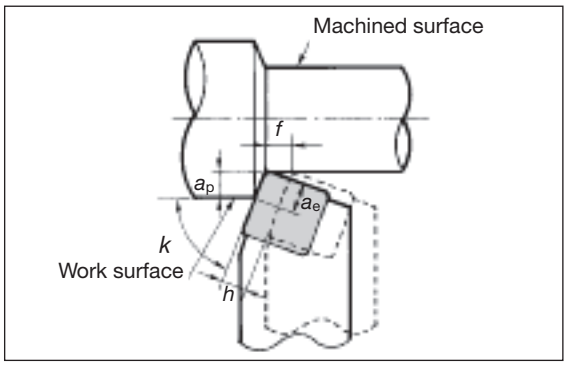
## Turning Tools

### Name of tools parts



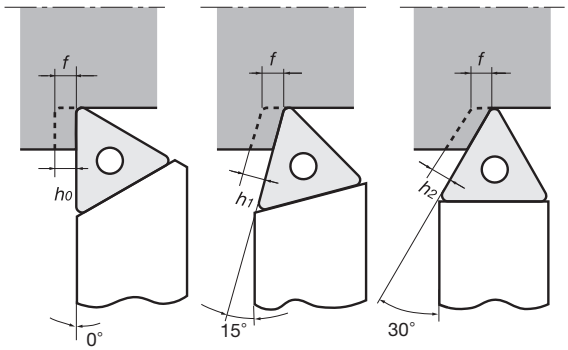




### Relating angles between tool and workpiece




$a_p$ … Depth of cut (Distance between work surface and machined surface)
$a_e$ … Length of cutting edge engaging in cutting.
$\kappa$ … Cutting edge angle (Angle to be made by cutting edge and work surface)
$f$ … Feed per revolution
$h$ … Thickness to be cut per revolution
Machined surface … Workpiece surface after having machined.
Work surface … Workpiece surface to be cut.

### ●Effect of side cutting edge angle




In the cutting of same feed, as the side cutting edge angle increases, the chip thickness decreases.

$h_0 > h_1 > h_2$

### ●Honing

TAC indexable inserts of steel cutting grades are honed.
Honing specifications are shown in the following table.

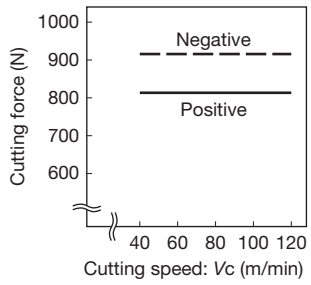
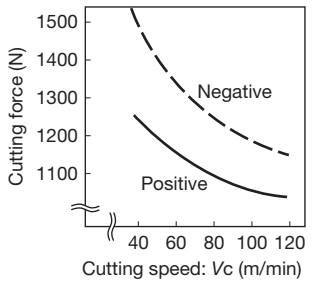
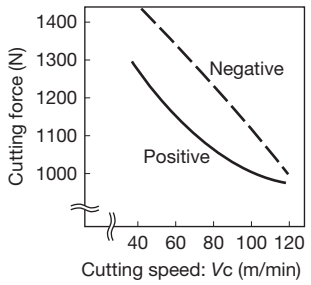
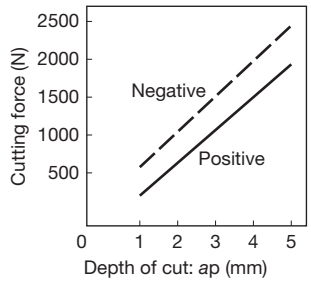
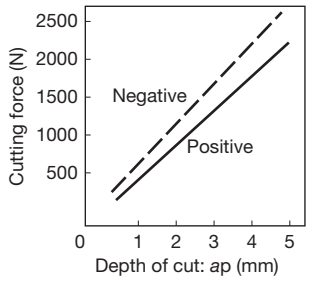
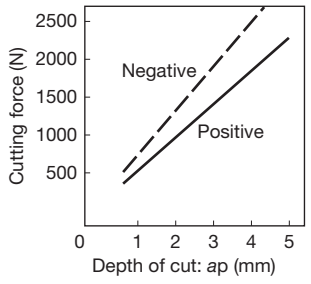
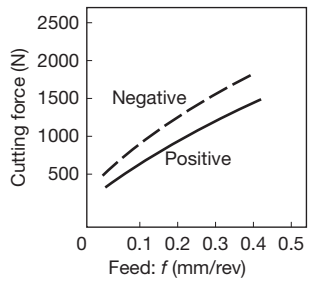
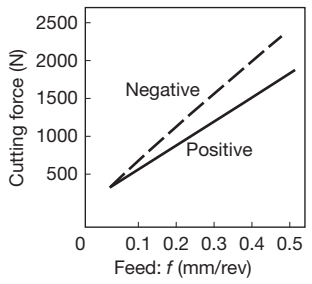
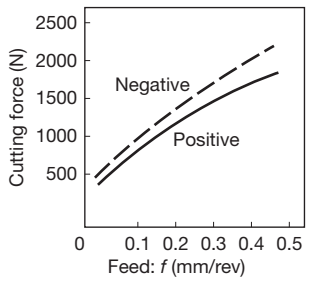
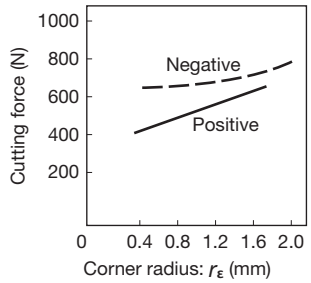
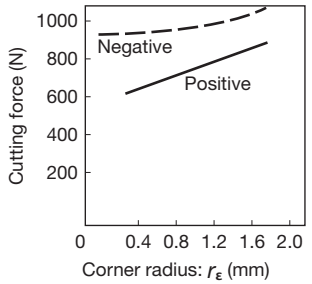
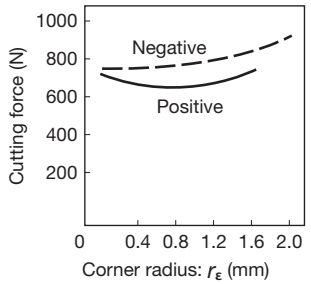
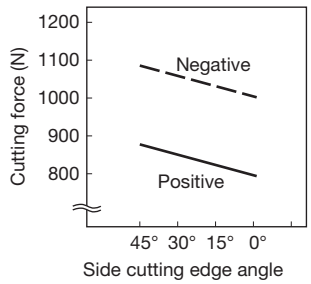
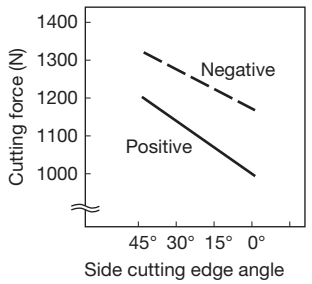
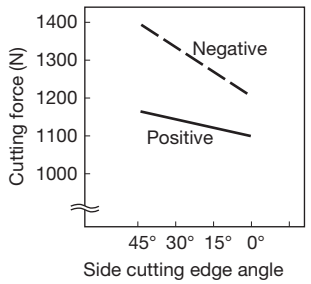
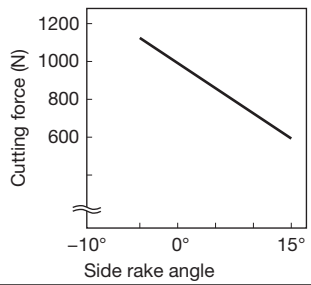
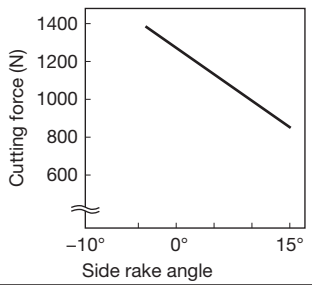
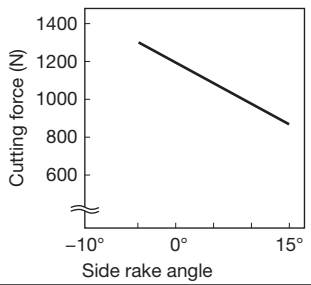
| Edge condition | Shape |
|---|---|
| Sharp edge | |
| Round honing | |
| Chamfered honing | |

### ●Effects of tool geometry on cutting phenomena

| Increasing \ Phenomena | Flank wear | Crater wear | Edge strength | Cutting force | Surface finish | Chattering | Cutting edge temperature | Chip shape and flow |
|---|---|---|---|---|---|---|---|---|
| Cutting edge inclination | – | Decrease | Lower | Radial force decrease | – | Less tendency | Lower | Effect on flow direction |
| Side rake angle | – | Decrease | Lower | Decrease | – | – | Lower | Effect on shape |
| Relief angle | Decrease | – | Lower | Decrease | – | Likely to occur | Lower | – |
| End cutting edge angle | Decrease | – | Lower | Radial force decrease | Roughen | Less tendency | Lower | – |
| Side cutting edge angle | Decrease | Decrease | Increase | Radial force decrease | – | Likely to occur | Increase | Decrease thickness |
| Nose radius | Decrease to some level | | Increase | Increase | Improve | Likely to occur | Increase | Effect on flow direction |
| Honing width | Increase | – | Increase | Increase | – | Likely to occur | Increase | – |

## Turning Tools

### Relations between cutting force and cutting conditions or cutting phenomena

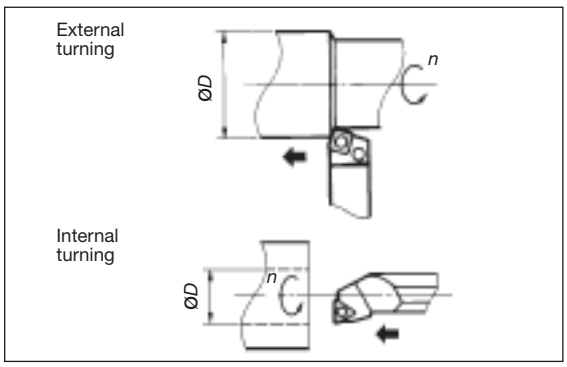
| Condition | Grey cast iron (HB130) | Stainless steel (HB145) | Carbon steel (HB230) |
|---|---|---|---|
| Cutting speed and cutting force<br>$f$ = 0.2 mm/rev<br>$a_p$ = 2 mm<br>Side cutting edge angle 0°<br>Corner radius $r_\varepsilon$ 0.4 |  |  |  |
| Depth of cut and cutting force<br>$V_c$ = 100 m/min<br>$f$ = 0.2 mm/rev<br>Side cutting edge angle 0°<br>Corner radius $r_\varepsilon$ 0.4 |  |  |  |
| Feed and cutting force<br>$V_c$ = 100 m/min<br>$a_p$ = 2 mm<br>Side cutting edge angle 0°<br>Corner radius $r_\varepsilon$ 0.4 |  |  |  |
| Corner radius and cutting force<br>$V_c$ = 100 m/min<br>$f$ = 0.2 mm/rev<br>$a_p$ = 1.2 mm<br>Side cutting edge angle 0° |  |  |  |
| Side cutting edge angle and cutting force<br>$V_c$ = 100 m/min<br>$f$ = 0.2 mm/rev<br>$a_p$ = 2 mm<br>Corner radius $r_\varepsilon$ 0.4 |  |  |  |
| Side rake angle and cutting force<br>$V_c$ = 100 m/min<br>$f$ = 0.2 mm/rev<br>$a_p$ = 2 mm<br>Side cutting edge angle 0°<br>Corner radius $r_\varepsilon$ 0.2 |  |  |  |

* 9.8N = 1kgf

Turning Tools

## Calculation formulas for turning

### ●Cutting speed




When calculating cutting speed from number of revolutions:

$$Vc = \frac{\pi \times \varnothing D \times n}{1000}$$

$V_c$ : Cutting speed (m/min)
$n$ : Number of revolution ($min^{-1}$)
$\varnothing D$ : Diameter of workpiece (mm)
$\pi \approx 3.14$

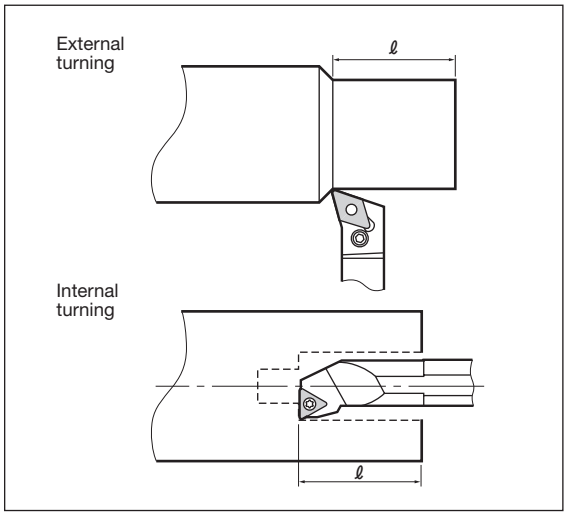
When calculating required number of revolutions from cutting speed:

$$n = \frac{Vc \times 1000}{\pi \times \varnothing D}$$

Example : Calculating the cutting speed when turning a ø150 mm-diameter workpiece at 250 $min^{-1}$

$$V_c = \frac{3.14 \times 150 \times 250}{1000} = 117 \text{ m/min}$$

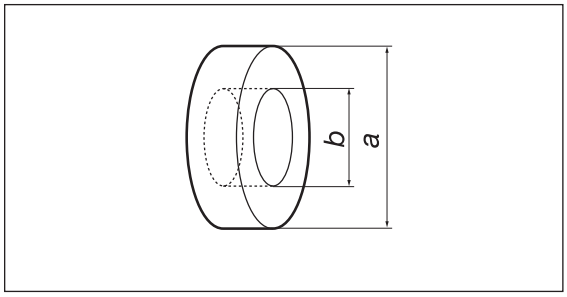
### ●Cutting time on external and internal turning




$$T_{(min)} = \frac{\ell}{f \times n}$$

T : Cutting time (min)
$\ell$ : Cutting length (mm)
$f$ : Feed (mm/rev)
$n$ : Number of revolution ($min^{-1}$)

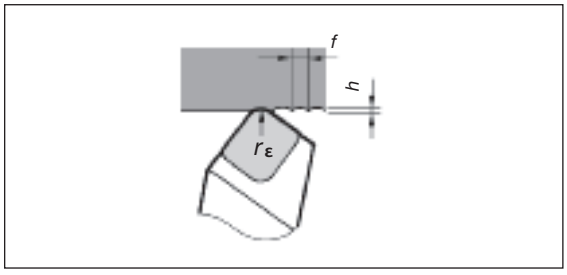
### ●Cutting time on face turning




$$T_{(min)} = \frac{\pi \times (a^2 - b^2)}{4000 \times v_c \times f}$$

$V_c$ : Cutting speed (m/min)
$f$ : Feed (mm/rev)
T : Cutting Time (min)

### ●Theoretical surface roughness




$$h_{(\mu m)} = \frac{f^2}{8 r_\varepsilon} \times 1000$$

$h$ : Surface roughness (μm)
$f$ : Feed (mm/rev)
$r_\varepsilon$ : Nose radius (mm)

### ●Calculation of power consumption (kW)

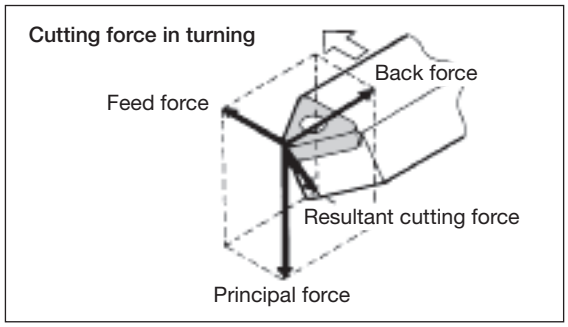
$$P_{c(kW)} = \frac{F \times v_c}{60000}$$

$P_c$ : Power requirement (kW)
$F$ : Cutting force (N)
$V_c$ : Cutting speed (m/min)

## Turning Tools

### ●Cutting forces

(1) Finding from the diagram based on experimental data.
(2) In case determining by simplified equation:




$$F = k_c \times a_p \times f \quad (N)$$

$F$ : Cutting force (N)
$k_c$ : Specific cutting force (N/mm²)
[Refer to the Table below]
$a_p$ : Depth of cut (mm)
$f$ : Feed (mm/rev)

Example :
Calculating the cutting force when cutting a high carbon steel (ISO C55) at $f$ = 0.2 mm/rev and $ap$ = 3 mm.
$F$ = 3430 × 3 × 0.2 = 2058N

### ●Calculating power requirement

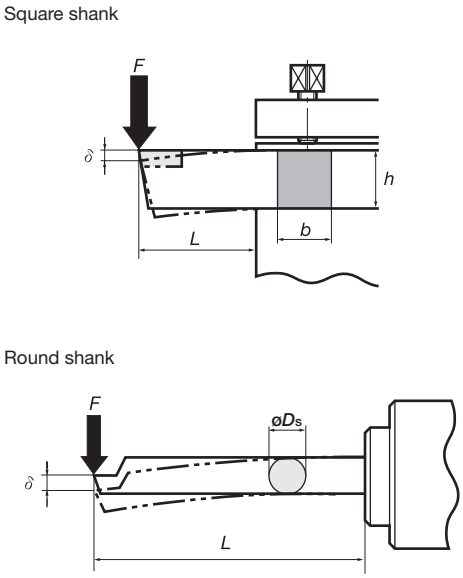
$$P_c = \frac{k_c \times a_p \times v_c \times f}{60 \times 1000} \quad (kW)$$

$P_c$ : Net power requirement (kW)
$k_c$ : Specific cutting force (N/mm²)
[Refer to the Table below]
$v_c$ : Cutting speed (m/min)
$a_p$ : Depth of cutting (mm)
$f$ : Feed (mm/rev)

### Value of specific cutting force ($k_c$)

| Workpiece material (JIS) | Tensile strength (MPa) | Hardness (HB) | Value of specific cutting force on feed $k_c$ (N/mm²) | | | | |
|---|---|---|---|---|---|---|---|
| | | | 0.04 (mm/rev) | 0.1 (mm/rev) | 0.2 (mm/rev) | 0.4 (mm/rev) | 1.0 (mm/rev) |
| SS400, S15C | 390 | 100 | 3430 | 2840 | 2450 | 2080 | 1700 |
| S35C, S40C | 590 | 170 | 4220 | 3490 | 2940 | 2500 | 2080 |
| S50C, SCr430 | 785 | 230 | 4900 | 4020 | 3430 | 2940 | 2400 |
| SCM440, SNCM439 | 980 | 300 | 5390 | 4410 | 3780 | 3240 | 2650 |
| SDK | 1765 ( 56HRC ) | 56HRC | 8390 | 6870 | 5880 | 5000 | 4120 |
| FC200 | ( 160HB ) | 160 | 2550 | 1960 | 1630 | 1340 | 1030 |
| FCD600 | ( 200HB ) | 200 | 3330 | 2550 | 2110 | 1750 | 1340 |
| Aluminium alloy | ( 89HB ) | 89 | 1350 | 1130 | 950 | 810 | 670 |
| Aluminium | | | 1050 | 870 | 740 | 640 | 520 |
| Magnesium alloy | | | 390 | 390 | 390 | 390 | 390 |
| Brass | | | 1080 | 1080 | 1080 | 1080 | 1080 |

### ●Bending stress and tool deflection




**Bending stress**

(1) Square shank

$$S = \frac{6 \times F \times L}{b \times h^2} \quad (MPa)$$

(2) Round shank

$$S = \frac{32 \times F \times L}{\pi \times \varnothing D_s^3} \quad (MPa)$$

$S$ : Bending stress in shank (MPa)
$F$ : Cutting force (N)
$L$ : Overhang length of tool (mm)
$b$ : Shank width (mm)
$h$ : Shank height (mm)
$\varnothing D_s$ : Shank diameter (mm)
$E$ : Modulus of elasticity of shank material (MPa)

**Tool defection (mm)**

(1) Square shank

$$\delta = \frac{4 \times F \times L^3}{E \times b \times h^3} \quad (mm)$$

(2) Round shank

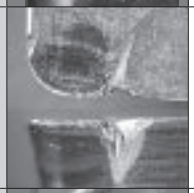
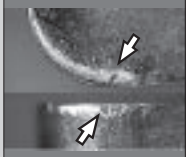
$$\delta = \frac{64 \times F \times L^3}{3 \times \pi \times E \times \varnothing D_s^4} \quad (mm)$$

(Ref.) Values of E

| Material | MPa (N/mm²) | {kgf/mm²} |
|---|---|---|
| Steel | 210,000 | 21,000 |
| Cemented Carbide | 560,000~620,000 | 56,000~62,000 |

Turning Tools

## Troubleshooting in turning

| Typical tool failure | | Countermeasure | | |
|---|---|---|---|---|
| | | Tool grade | Cutting conditions | Tool geometry |
| Flank wear |  | • Change to more wear resistant grades<br>**P, M, K30 → 20 → 10** | • Reduce cutting speed<br>• Change to appropriate feed<br>• Change to wet cutting | • Decrease honing width<br>• Increase relief angle<br>• Increase end cutting edge angle<br>• Increase corner radius<br>• Select free-cutting chipbreaker<br>• Increase rake angle |
| Crater wear |  | • Change to more wear resistant grades<br>**P, M, K30 → 20 → 10** | • Reduce cutting speed<br>• Reduce feed<br>• Reduce depth of cut<br>• Change to wet cutting | • Increase rake angle<br>• Select an appropriate chipbreaker<br>• Increase side cutting edge angle<br>• Increase corner radius |
| Notch wear |  | • Change to more wear resistant grades<br>**P, M, K30 → 20 → 10** | • Reduce cutting speed<br>• Reduce feed | • Increase rake angle<br>• Increase side cutting edge angle |
| Fracture |  | • Change to tougher grades<br>• Change to thermal-shock resistant grades<br>**P, M, K10 → 20 → 30** | • Reduce feed<br>• Reduce depth of cut<br>• Improve holding rigidity of work and tool<br>• Reduce overhang length of toolholder<br>• Improve looseness in machine | • Reduce rake angle<br>• Select a chipbreaker with high edge strength<br>• Increase honing width<br>• Increase side cutting edge angle<br>• Select larger shank size<br>• Increase corner radius |
| Chipping |  | • Change to tougher grades<br>**P, M, K10 → 20 → 30** | • Reduce cutting speed<br>• Reduce feed<br>• Reduce depth of cut<br>• Improve holding rigidity of work and tool<br>• Reduce overhang length of toolholder<br>• Improve looseness in machine | • Reduce rake angle<br>• Select a chipbreaker with high edge strength<br>• Increase honing width<br>• Increase side cutting edge angle<br>• Select larger shank size |
| Flaking |  | • Change to tougher grades<br>**P, M, K10 → 20 → 30** | • Reduce cutting speed<br>• Reduce feed | • Reduce rake angle<br>• Increase corner radius<br>• Increase honing width |
| Plastic deformation |  | • Change to more wear resistant grade<br>**P, M, K30 → 20 → 10** | • Reduce cutting speed<br>• Change to appropriate feed<br>• Reduce depth of cut<br>• Supply cutting fluid in adequate volume | • Increase relief angle<br>• Increase rake angle<br>• Reduce corner radius<br>• Reduce side cutting edge angle<br>• Select a free-cutting chipbreaker |
| Chip welding |  | • Use a grade which has a low tendency to adhere to Workpiece material<br>**Cemented carbide → Coated carbide or cermet** | • Increase cutting speed<br>• Increase feed<br>• Change to water-insoluble cutting fluid<br>• Change to wet cutting | • Increase rake angle<br>• Select a free-cutting chipbreaker<br>• Decrease honing width |
| Built-up edge |  | | | |
| Thermal cracking |  | • Change to tougher grades<br>• Change to thermal-shock resistant grades<br>**P, M, K10 → 20 → 30** | • Reduce cutting speed<br>• Reduce feed<br>• Change to dry cutting<br>• Supply cutting fluid in adequate volume<br>• Reduce depth of cut<br>• Change to water-insoluble cutting fluid | • Increase rake angle<br>• Select a free-cutting chipbreaker<br>• Decrease honing width |

## Turning Tools

| Problem | Cause | Countermeasure | |
|---|---|---|---|
| | | Tool | Cutting conditions and others |
| Deteriorated surface roughness | • Increased tool wear | • Select a more wear resistant grade<br>• Use an insert with a larger rake angle<br>• Use an insert with a larger nose radius<br>• Use a more lightly honed insert<br>• Use an insert of closer tolerance (from M class to G class) | • Select a proper feed<br>• Decrease the cutting speed<br>• Select a freer-cutting chipbreaker type<br>• Use a cutting fluid |
| | • Edge chipping | • Use a tougher grade<br>• Select a chipbreaker with strong cutting edges<br>• Use a largely honed insert<br>• Increase the side cutting edge angle<br>• Use a larger shank size | • Decrease the depth of cut<br>• Decrease the feed<br>• Use a more rigid machine<br>• Improve the holding rigidity of the tool and workpiece<br>• Shorten the overhang of the toolholder<br>• Improve the machine looseness |
| | • Chip welding<br>• Built-up-edge | • Select a grade with less affinity with the Workpiece material<br>• Use an insert with a larger rake angle<br>• Select a freer-cutting chipbreaker type<br>• Use a more lightly honed insert<br>• Use an insert of closer tolerance (from M class to G class) | • Increase the cutting speed<br>• Increase the feed<br>• Use a water-insoluble cutting fluid<br>• Use a cutting fluid |
| | • Vibration and chatter | • Use a tougher grade<br>• Use an insert with a larger rake angle<br>• Select a freer-cutting chipbreaker type<br>• Use an insert with a smaller nose radius<br>• Decrease the side cutting edge angle<br>• Use a more lightly honed insert<br>• Use a larger shank size | • Use a proper cutting speed<br>• Decrease the feed<br>• Decrease the depth of cut<br>• Improve the holding rigidity of the tool and workpiece<br>• Shorten the overhang of the toolholder<br>• Improve the machine looseness |
| Deteriorated dimensional accuracy | • Improper insert accuracy | • Use an insert of closer tolerance (from M class to G class) | |
| | • Incomplete engagement of tool and workpiece | • Use an insert with a larger rake angle<br>• Select a freer-cutting chipbreaker type<br>• Use an insert with a smaller nose radius<br>• Use a more lightly honed insert | • Improve the holding rigidity of the tool and workpiece<br>• Shorten the overhang of the toolholder<br>• Improve the machine looseness |
| Burr occurrence | • Unsuitable cutting speed | | • Decrease the cutting speed<br>• Increase the feed<br>• Use a cutting fluid |
| | • Worn tool or improper cutting edge geometry | • Use a harder grade<br>• Use an insert with a larger rake angle<br>• Select a freer-cutting chipbreaker type<br>• Increase the relief angle<br>• Use an insert with a smaller nose radius<br>• Decrease the side cutting edge angle<br>• Use a more lightly honed insert | |
| Edge breakout | • Improper cutting speed | | • Decrease the feed<br>• Decrease the depth of cut |
| | • Worn tool or improper cutting edge geometry | • Use a harder grade<br>• Use an insert with a larger rake angle<br>• Select a freer-cutting chipbreaker type<br>• Increase the side cutting edge angle<br>• Use an insert with a larger nose radius<br>• Use a more lightly honed insert<br>• Use a larger shank size | • Improve the holding rigidity of the tool and workpiece<br>• Shorten the overhang of the toolholder<br>• Improve the machine looseness |
| Fuzzy surface finish | • Improper cutting conditions | | • Increase the cutting speed<br>• Select a proper feed<br>• Use a water-insoluble cutting fluid<br>• Use a cutting fluid |
| | • Worn tool or improper cutting edge geometry | • Use a harder grade.<br>• Select a grade with less affinity with the Workpiece material<br>• Use an insert with a larger rake angle<br>• Select a freer-cutting chipbreaker type<br>• Use a more lightly honed insert | |

## Chipbreakers

### Chip controllability

**Necessity of chip control**

①Why is chip control needed?
②Effect of improper chip control

**Necessity of chip control (Problems and effects)**

| Problems | Effects |
|---|---|
| 1. Scattering of chips and coolant.<br>2. Wrapping around the workpiece and the tool.<br>3. Accumulation on the tool, jig, and machining facilities. | 1. Disturbs unmanned and automated machining.<br>2. Disturbs high-speed and high-efficiency machining.<br>3. Degrades finished surface.<br>4. Threatens operator's safety.<br>5. Reduced operation rate. |

Additional problems when chips are not properly controlled

#### ①Why is chip control needed?

What is chip?

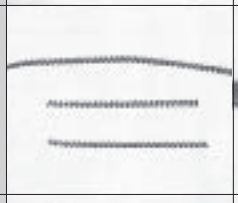
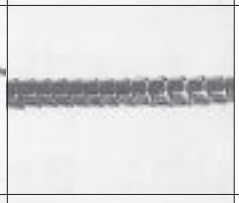
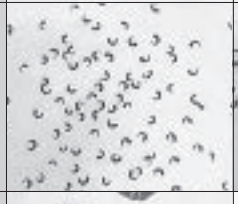
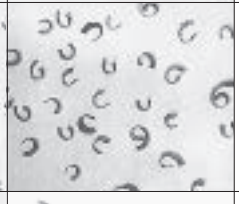
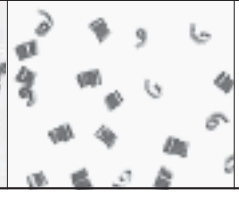
For making a product from a workpiece, removed objects produced by a tool which is set to cut to a specified depth with the relative motion of the tool and the workpiece.

Problems when chips are not properly controlled

#### ②Effect of improper chip control

- Effects on quality → • Defective work. • Defective surface finish • Chip entangling
- Effects on operation → • Increased number of man-hours for handling. • Increased tool costs. • Troublesome chip handling. • Machine stoppage and reduced operation rate.
- Effect on safety and health. → • Stain and damage on machine caused from improper carrying-out of chips. • Dangerous effects on the human body. (Injury and burns on hand, etc.)

Effective measures → **"Chipbreaker"**

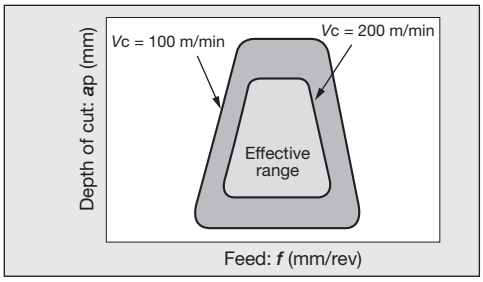
| Classi-fication | Chip shape: Depth of cut: small | Chip shape: Depth of cut: large | Description of chip shape | Acceptability | Effect |
|---|---|---|---|---|---|
| Shape A |  |  | Chips irregularly entangled | Not acceptable | • Wrapping around the tool or workpiece or accumulation around the cutting point, hindering cutting<br>• Possible damage to the machined surface |
| Shape B |  |  | Long continuous spiral chips<br>$\ell > 50$ mm | Acceptable | • Bulky during transport in the automatic line<br>• May be preferred when one operator handles one machine |
| Shape C |  |  | Short spiral chips<br>$\ell < 50$ mm | Acceptable | • Smooth chip flow<br>• Difficult to scatter<br>• Favorable shape |
| Shape D |  |  | "C" or "9" shaped chips (Around one coiling) | Acceptable | • Favorable shape if not scattering<br>• Not bulky and easy to transport |
| Shape E |  |  | Excessively broken chips. Thin pieces or connected in a form of wave as shown in the figure left | Not acceptable | • Readily scattering. If scattering is the only trouble, it may be acceptable because the chip cover, etc. may be used.<br>• Tend to cause chatter, causing harm on the finished surface roughness or tool life. |

## Chipbreakers

### Factors affecting chip control

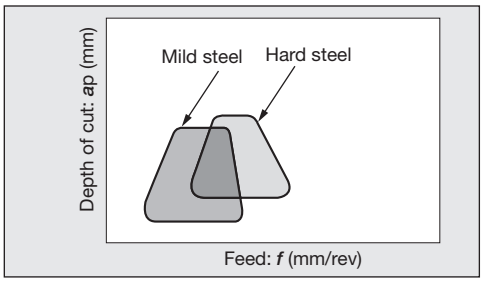
**(1) Cutting conditions**
1 Feed
2 Depth of cut
3 Cutting speed

- Of these, feed has the greatest effect followed by depth of cut and cutting speed in order listed.
- Feed is proportionate to the thickness of chips.
- Depth of cut is proportionate to the width of chips.
- There are optimum values (effective range) in feed and depth of cut.
- Cutting speed is in inverse proportion to chip thickness. Effective range becomes narrow at high speed.



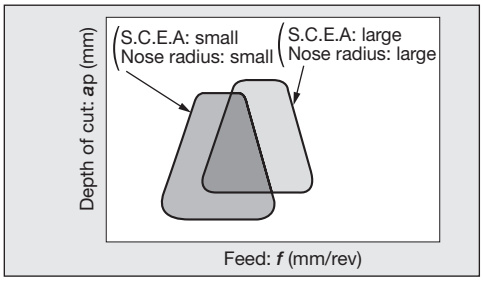

**(2) Workpiece material**
1 Alloy element
2 Hardness
3 Heat treatment condition

- These are related to thickness of chips and ease of curling.
- Mild steel chips are thicker than those of hard steel.
- Hard steel chips are liable to curl more than those of mild steel.
- Chips that do not curl are thin. As an exception, in case of mild steel even if thick, may not curl.



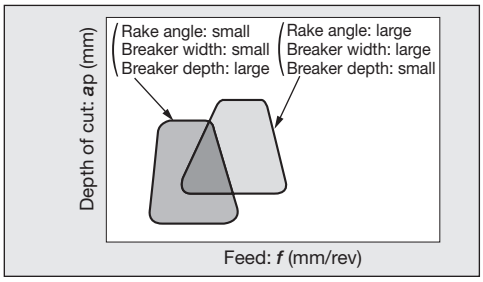

**(3) Tool geometry**
1 Side cutting edge angle
2 Nose radius

- Side cutting edge angle is relative to chip thickness and width
- Side cutting edge angle is preferably small.
- Nose radius is relative to thickness and width and the direction of flowing out.
- In finishing, small nose radius, whilst for rough cutting, large nose radius is better.



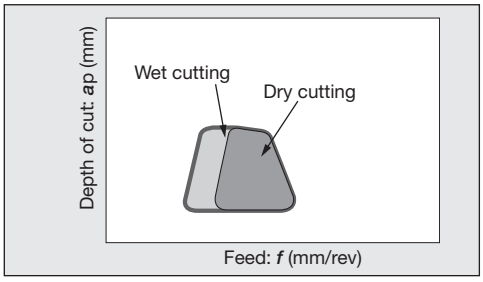

**(4) Shape of chipbreaker**
1 Rake angle
2 Chipbreaker width
3 Chipbreaker depth

- Rake angle is in inverse proportion to chip thickness.
- Depending on the Workpiece material, there is an optimum value.
- Chipbreaker width is selected proportionately to feed.
- Narrow at low feed and wide at high feed.
- Chipbreaker depth is to be selected so as to be inversely proportionate to feed.
- Deep at low feed and shallow at high feed.




**(5) Coolant**

- Effective range is wider with wet cutting.
- Especially at low feed range is liable to curl.

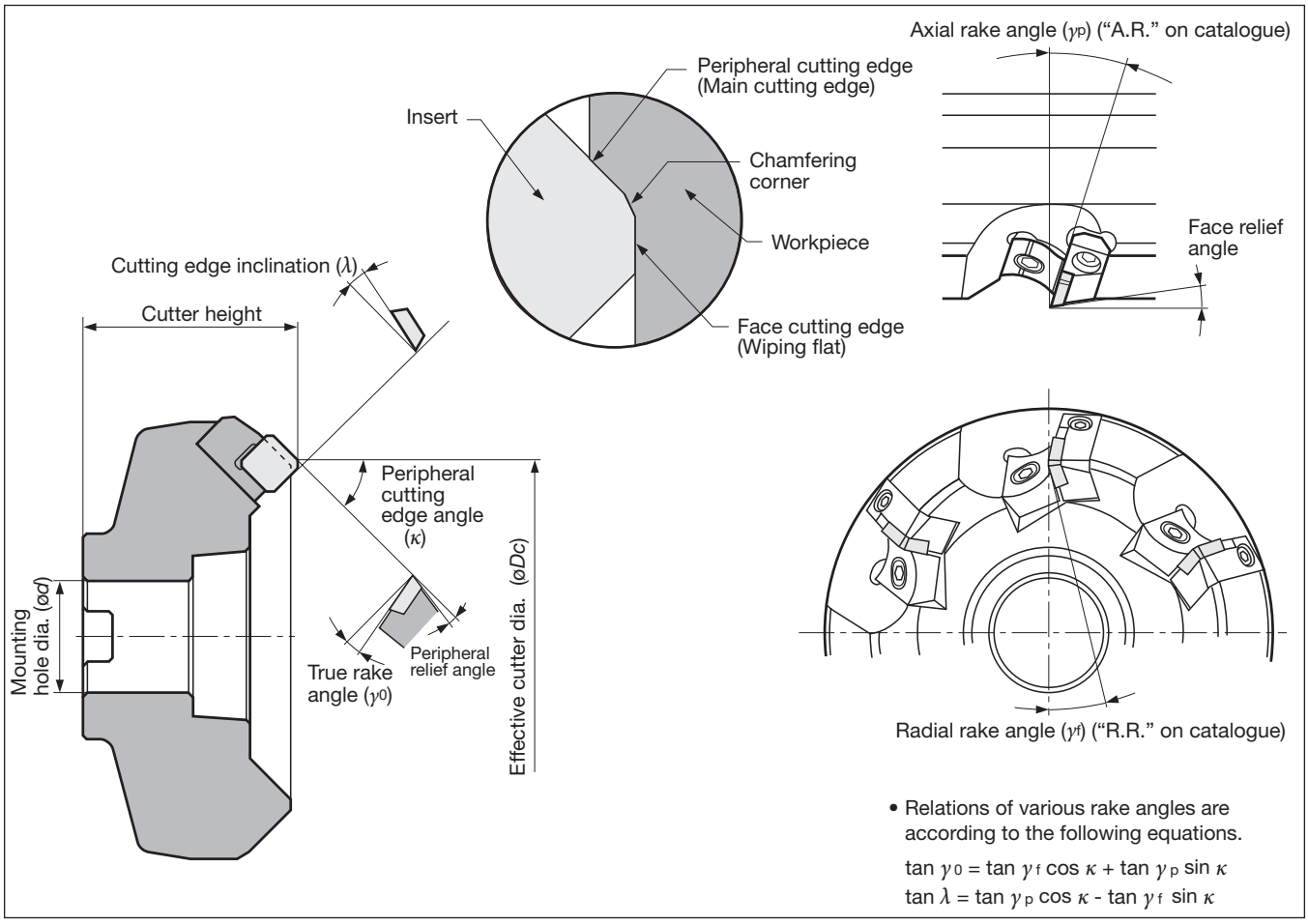



**(6) Machine**
1 Rigidity
2 Power limit

- The machine has enough power and mechanical strength.
- Select the machine consistent with the size of Workpiece material to be used.

## Milling tools

### Nomenclature for face milling cutter




- Relations of various rake angles are according to the following equations.

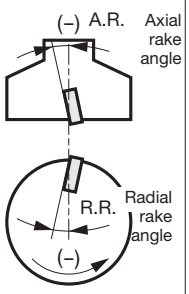
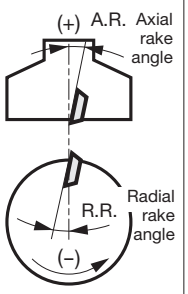
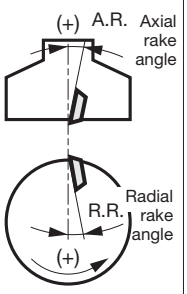
$\tan \gamma_0 = \tan \gamma_f \cos \kappa + \tan \gamma_p \sin \kappa$

$\tan \lambda = \tan \gamma_p \cos \kappa - \tan \gamma_f \sin \kappa$

### Cutter geometry and applications

| Condition | | Rake angle combination and applicability | | |
|---|---|---|---|---|
| | | Negative-Negative | Negative-Positive | Positive-Positive |
| Shapes of cutting edge | γp (A.R.) | - | + | + |
| | γf (R.R.) | - | - | + |
| | γo | - | + | + |
| Workpiece material | Carbon steels, alloy steels (< 300HB) | △ | ◎ | ◎ |
| | Stainless steels (< 300HB) | × | ◎ | ○ |
| | Die steels (< 300HB) | △ | ◎ | ○ |
| | Cast irons Ductile cast irons | ◎ | ○ | ○ |
| | Aluminium alloys | × | ○ | ◎ |
| | Copper and its alloys | × | ○ | ◎ |
| | Titanium and its alloys | × | ○ | ○ |
| | Hardened steels (40 ~ 55HRC) | ○ | ○ | × |
| Features | | · Higher cutting edge strength<br>· Many usable corners of inserts | · Excellent chip removal<br>· Higher cutting edge strength and Freer cutting action | · Most excellent cutting action |
| Typical examples of mills | | TGN4200<br>DoPent | TAW13<br>TME4400<br>TMD4400 | THF4000<br>THE4000 |

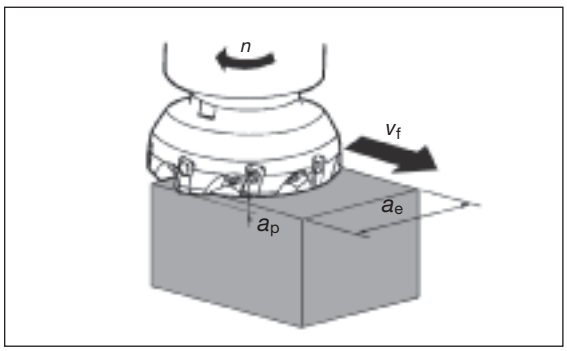
**Rake angle combination**

| Negative type (Negative-Negative) | Negative-Positive type | Positive type (Positive-Positive) |
|---|---|---|
|  |  |  |

Milling tools

## Calculation formulas for milling

### ●Cutting speed



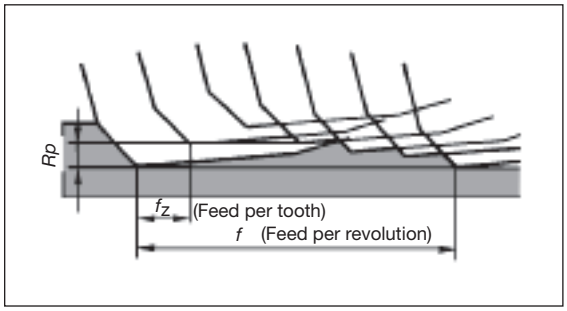

●**Cutting speed** (Calculated from number of revolutions)

$$v_c\ (\text{m/min}) = \frac{\pi \times \varnothing D_c \times n}{1000}$$

$v_c$ : Cutting speed (m/min)
$\varnothing D_c$: Effective diameter (mm)
$n$ : Number of revolutions ($\text{min}^{-1}$)
$\pi \approx 3.14$

●**Number of revolution** (Calculated from cutting speed)

$$n\ (\text{min}^{-1}) = \frac{1000 \times v_c}{\pi \times \varnothing D_c}$$



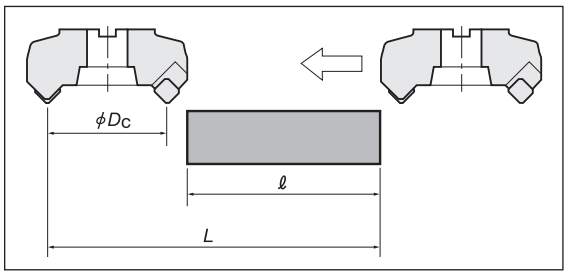

●**Feed speed and feed per tooth**

$$v_f\ (\text{mm/min}) = f_z \times z \times n$$

$v_f$ : Feed speed (mm/min)
$f_z$ : Feed per tooth (mm/t)
z : No. of teeth of the cutter
$n$ : Number of revolutions ($\text{min}^{-1}$)

Feed speed is relative speed of cutter and Workpiece material and in the normal milling machine, it is the table speed.
In milling, the feed per tooth is very important. The recommended cutting condition is expressed by $v_c$ and $f_z$ and using the above equation calculate $n$ and $v_f$ and input in the machine.

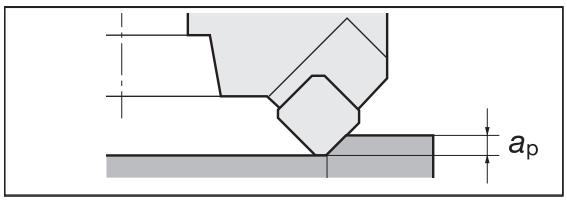
### ●Cutting time on face milling




$$T\ (\text{min}) = \frac{L}{v_f}$$

T : Cutting time (min)
L : Total table feed length.
($\ell$ : Workpieces length (mm) + $\varnothing D_c$: Effective cutter diameter (mm))
$v_f$ : Feed speed (mm/min)

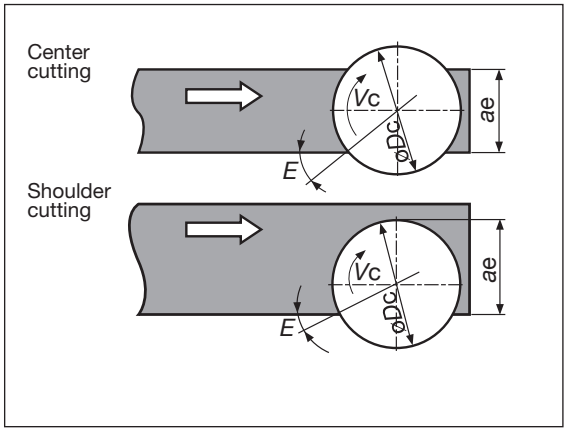
## Depth of cut and width of cut




●**Depth of cut**

Determine by required allowance for machining and capacity of the machine. In case of mill, there are cutting limits according to shape and size of the insert. Please see spec on the catalogue.

$a_p$ : Depth of cut (mm)




●**Width of cut and engagement angle**

There is an appropriate engage angle depending on the cutter diameter, cutting position, Workpiece material, etc., and ordinarily the values in the table below are used as a guide.

$\varnothing D_c$: Cutter diameter (mm)
$E$: Engage angle
$a_e$: Width of cut (mm)

Center cutting

| Workpiece material | Appropriate E | Cutter dia. and $a_e$ |
|---|---|---|
| Steel | ~ 42° | $a_e \approx \frac{2}{3}\ \varnothing D_c$ |
| Cast iron | ~ 53° | $a_e \approx \frac{4}{5}\ \varnothing D_c$ |

Shoulder cutting

| Workpiece material | Appropriate E | Cutter dia. and $a_e$ |
|---|---|---|
| Steel | ~ 30° | $a_e \approx \frac{3}{5}\ \varnothing D_c$ |
| Cast iron | ~ 40° | $a_e \approx \frac{3}{4}\ \varnothing D_c$ |

## Milling tools

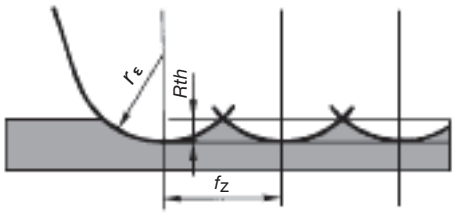
### Roughness of finished surface

**(1) Theoretical surface roughness**

Theoretical roughness as shown below, is the same as for single point turning

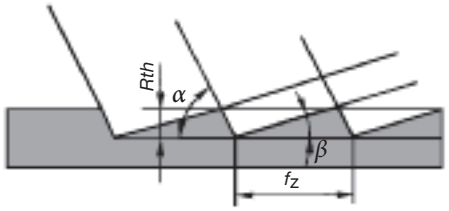
●With corner radius $r_\varepsilon$

$$Rth = \frac{fz^2}{8r_\varepsilon} \times 1000$$

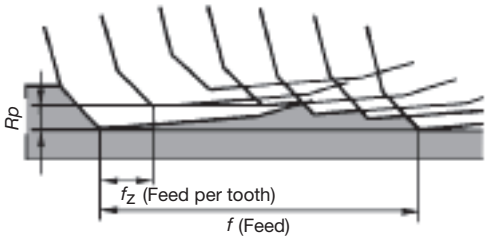



●Without corner radius $r_\varepsilon$

$$Rth = fz\left(\frac{\tan\alpha \cdot \tan\beta}{\tan\alpha + \tan\beta}\right) \times 1000$$



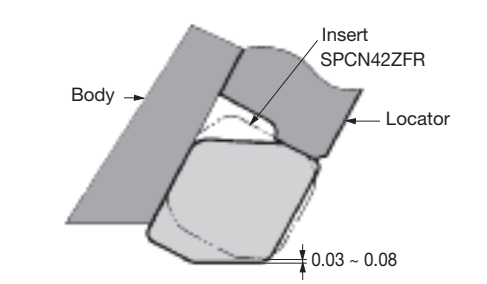

*Rth* : Theoretical roughness (μm)
$f_z$ : Feed per tooth (mm/t)
$r_\varepsilon$ : Corner radius (mm)
$\alpha$ : Corner angle
$\beta$ : Face cutting edge angle




**(2) Practical surface roughness**

In case of practical milling, there are many teeth and natural differences in levels of edges occur. The maximum difference is called "run out". (*Rp*)
In the actual face milling, finished surface roughness, as shown left, is worse than the single point cutting. If only one tooth is projecting, it will be similar to the single point shown above but of a large value substituting *f* (mm/rev) for *fz* (mm/t).

### Improving surface roughness




Face run out must be minimized and a low feed and high speed should be used. Also, in order to attain good finished surface at high efficiency, there are the following methods:

(1) In case of ordinary mill
Use wiper insert as shown in the figure at left.

(2) Use of super finish mill for finishing.
- Use of combination mills with finishing insert such as TFD4400-A and TFP4000Ⅰ A ($a_p$ < 1.0 mm).
- Use of supe finish mill for finishing such as NMS cutters and SFP4000 etc.

## Milling Tools

### Calculating power requirement

$$P_c = \frac{k_c \times a_p \times a_e \times v_f}{60 \times 1000 \times 1000} \quad (kW)$$

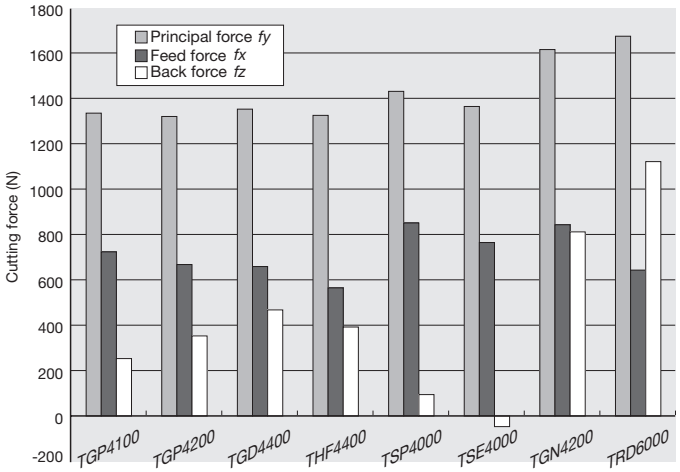
Because practical power requirements depend on the type of mill (proportional to the true rake angle) and the motor efficiency of the machine used, the result calculated from the above formula should be considered as a rough guide.

$P_c$ : Net power requirement (kW)
$k_c$ : Specific cutting force (N/mm²)
[Refer to the Table below]
$a_p$ : Depth of cut (mm)
$a_e$ : Width of cut (mm)
$v_f$ : Feed speed (mm/min)

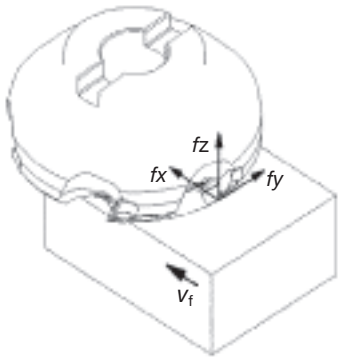
●Values of specific cutting force ($k_c$)

| Workpiece material (JIS) | Tensile strength | Value of specific cutting force on feed per tooth $k_c$ (N/mm²) | | | | |
|---|---|---|---|---|---|---|
| | MPa | 0.1 (mm/t) | 0.15 (mm/t) | 0.2 (mm/t) | 0.3 (mm/t) | 0.4 (mm/t) |
| SS400 | 520 | 2150 | 2000 | 1900 | 1750 | 1650 |
| S55C | 770 | 1970 | 1860 | 1800 | 1760 | 1620 |
| SCM435 | 730 | 2450 | 2350 | 2200 | 1980 | 1710 |
| SKT4 | (HB352) | 2030 | 2010 | 1810 | 1680 | 1590 |
| SC450 | 520 | 2710 | 2530 | 2410 | 2240 | 2120 |
| FC250 | (HB200) | 1660 | 1450 | 1320 | 1150 | 1030 |
| Al (Si) | 200 | 660 | 580 | 522 | 460 | 410 |
| Brass | 500 | 1090 | 960 | 877 | 760 | 680 |

●Values of cutting force ($k_c$)




Workpiece material : S50C (210HB), Diameter of mill : ø160 mm
Cutting speed : $V_c$ = 150 m/min, Feed per tooth: $f_z$ = 0.20 mm/t
Depth of cut: $a_p$ = 3 mm, Cutting by a single edge, dry




●Conversion from cutting speed to number of revolutions

(unit : min⁻¹)

| Cutter diameter $ØD_c$ ( mm ) | Cutting speed ( $v_c$ ) m/min | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 10 | 30 | 50 | 100 | 125 | 150 | 200 | 300 | 500 | 800 | 1,000 | 2,000 | 4,000 |
| 10 | 318 | 955 | 1,592 | 3,184 | 3,980 | 4,777 | 6,369 | 9,554 | 15,923 | 25,477 | 31,847 | 63,694 | 127,388 |
| 12 | 265 | 796 | 1,326 | 2,653 | 3,317 | 3,980 | 5,307 | 7,961 | 13,269 | 21,231 | 26,539 | 53,078 | 106,157 |
| 16 | 199 | 597 | 995 | 1,990 | 2,488 | 2,985 | 3,980 | 5,971 | 9,952 | 15,923 | 19,904 | 39,808 | 79,617 |
| 20 | 159 | 477 | 796 | 1,592 | 1,990 | 2,388 | 3,184 | 4,777 | 7,961 | 12,738 | 15,923 | 31,847 | 63,694 |
| 25 | 127 | 382 | 636 | 1,273 | 1,592 | 1,910 | 2,547 | 3,821 | 6,369 | 10,191 | 12,738 | 25,477 | 50,955 |
| 30 | 106 | 318 | 530 | 1,061 | 1,326 | 1,592 | 2,123 | 3,184 | 5,307 | 8,492 | 10,615 | 21,231 | 42,462 |
| 32 | 99 | 298 | 497 | 995 | 1,244 | 1,492 | 1,990 | 2,985 | 4,976 | 7,961 | 9,952 | 19,904 | 39,808 |
| 35 | 90 | 272 | 454 | 909 | 1,137 | 1,364 | 1,819 | 2,729 | 4,549 | 7,279 | 9,099 | 18,198 | 36,396 |
| 40 | 79 | 238 | 398 | 796 | 995 | 1,194 | 1,592 | 2,388 | 3,980 | 6,369 | 7,961 | 15,923 | 31,847 |
| 50 | 63 | 191 | 318 | 636 | 796 | 955 | 1,273 | 1,910 | 3,184 | 5,095 | 6,369 | 12,738 | 25,477 |
| 63 | 50 | 151 | 252 | 505 | 631 | 758 | 1,011 | 1,516 | 2,527 | 4,044 | 5,055 | 10,110 | 20,220 |
| 80 | 39 | 119 | 199 | 398 | 497 | 597 | 796 | 1,194 | 1,990 | 3,184 | 3,980 | 7,961 | 15,923 |
| 100 | 31 | 95 | 159 | 318 | 398 | 477 | 636 | 955 | 1,592 | 2,547 | 3,184 | 6,369 | 12,738 |
| 125 | 25 | 76 | 127 | 254 | 318 | 382 | 509 | 764 | 1,273 | 2,038 | 2,547 | 5,095 | 10,191 |
| 160 | 19 | 59 | 99 | 199 | 248 | 298 | 398 | 597 | 995 | 1,592 | 1,990 | 3,980 | 7,961 |
| 200 | 15 | 47 | 79 | 159 | 199 | 238 | 318 | 477 | 796 | 1,273 | 1,592 | 3,184 | 6,369 |
| 250 | 12 | 38 | 63 | 127 | 159 | 191 | 254 | 382 | 636 | 1,019 | 1,273 | 2,547 | 5,095 |
| 315 | 10 | 30 | 50 | 101 | 126 | 151 | 202 | 303 | 505 | 808 | 1,011 | 2,022 | 4,044 |

Note: In this table, the effects of centrifugal force on the rotating balance of the tool and the toolholder, flying risk of cutter parts, and limited value of toolholder destruction are not considered. Therefore, when using the tool at high speeds, be sure to observe the specified condition range.

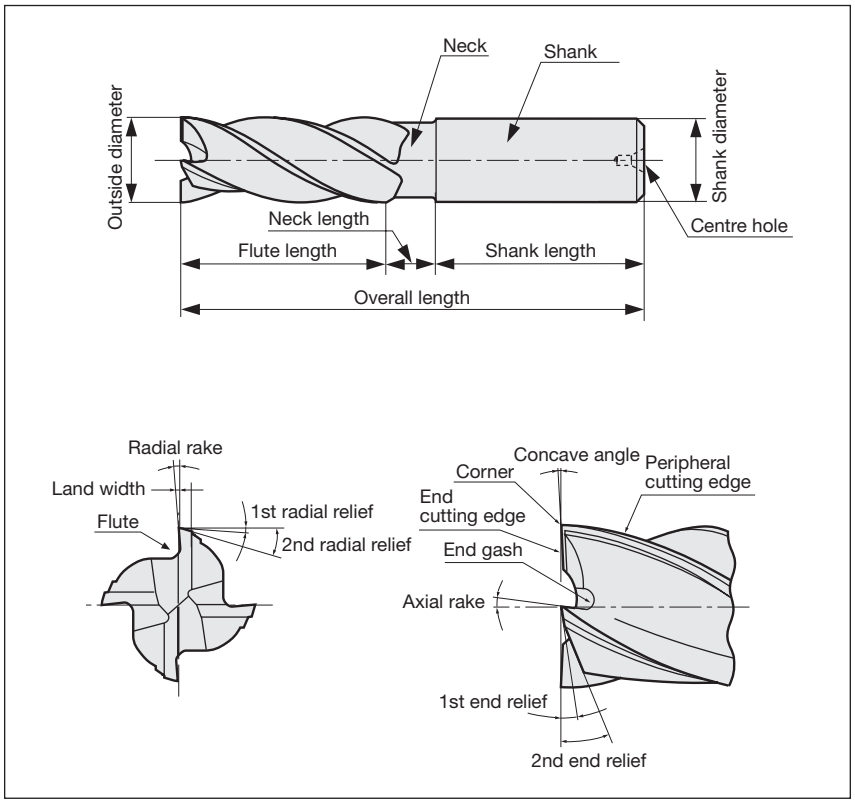
Milling Tools

## Trouble shooting in face milling

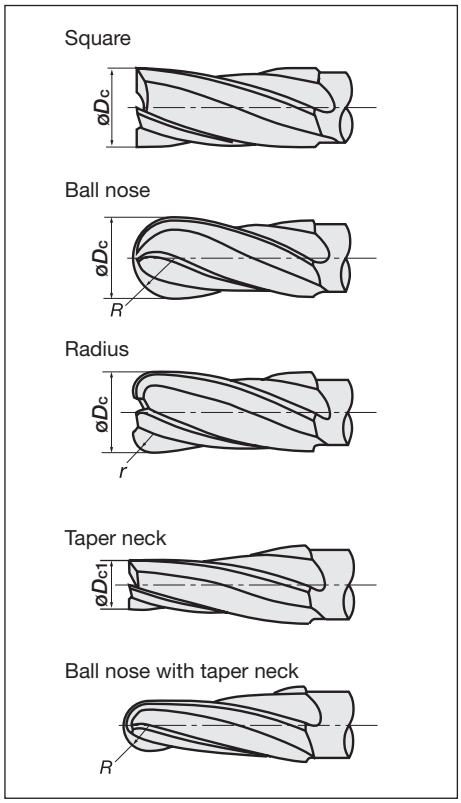
| Trouble | Possible causes | Countermeasures |
|---|---|---|
| Rapid wear of cutting edge | • Improper insert grade selection (Insufficient wear resistance) | • P30 (Cemented carbide) → Cermet, coated grade (For steels)<br>• K10 (Cemented carbide) → Coated grade (For cast irons) |
| | • Excessive cutting speed | • Select cutting speed suited for Workpiece material and insert grade |
| | • Inadequate feed | • Use standard cutting condition in catalog as guide |
| Rapid chipping of cutting edge | • Improper Insert grade selection (Insufficient toughness) | • Cermet → P30 (For steels), K10 → K20 (For cast irons) |
| | • Cutting hard material and unfavorable surface condition | • Decrease cutting speed<br>• Use cutter with strong cutting edge |
| | • Excessive feed | • Proper selection of feed conditions, using recommended cutting conditions in catalog as guide |
| | • Excessive pressure applied on cutting edge | • Proper selection of engaging angle |
| | • Machining superalloys | • Use a negative-positive type cutter with large corner angle |
| Fracturing | • Cracking due to thermal shock | • Select insert grade of stronger thermal shock resistance<br>• Decrease cutting speed |
| | • Continuous use of excessively worn insert | • Shorten replacement standard time of insert |
| | • Cutting hard material | • Use cutter with stronger cutting edge<br>• Use cutter of larger corner angle |
| | • Obstruction to chip flow<br>• Recutting of chips after chip welding | • Use cutter with better chip expulsion<br>• Select insert grades difficult for chips to adhere<br>Cemented carbides → cermets, coated grades<br>• Use air blow |
| | • Excessively slow cutting, too fine feed | • Select cutting speed and feed optimized for insert grade and Workpiece material |
| Excessive chip welding or build-up on cutting edge | • Cutting soft material such as aluminium, copper, mild steel | • Use cutter with large rake angle |
| | • Cutting stainless steel | • P30 → coated grades (AH130、AH3135) |
| | • Use of cutter with negative rake or too small rake angle | • Use cutter with large rake angle |
| Rough finish | • Effect of built-up edge | • Increase cutting speed<br>• Appropriate cutting depth (finish allowance)<br>• Change insert grade For steels : P → coated → cermet<br>For cast irons : K → coated |
| | • Effect of face cutting edge run out | • Proper installing of inserts<br>• Use insert of high dimensional accuracy<br>• Cleaning of insert pocket |
| | • Continuous use of excessively worn insert | • Shorten replacement standard time of insert |
| | • Remarkable feed marks | • Feed per revolution to be set within flatland width<br>• Use wiper insert type cutter such as T/EAW13<br>• Use cutter exclusively for finishing |
| Chattering | • Unstable clamping of workpiece | • Check clamping method of workpiece |
| | • Cutting of welded construction of thin steel plate | • Adopt cutter of large rake angle and small corner angle |
| | • Excessive cutting condition | • Re-examine allowable chip removal rate according to motor HP |
| | • Face milling of narrow width workpiece | • Use cutter of small cutter diameter and with many teeth |
| | • Too many simultaneous cutting teeth engagement | • Reduce No. of teeth or adopt irregular pitch cutter |

## Solid Carbide Endmills

### Part details

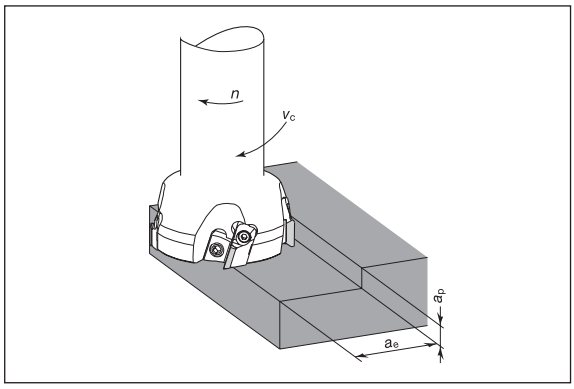


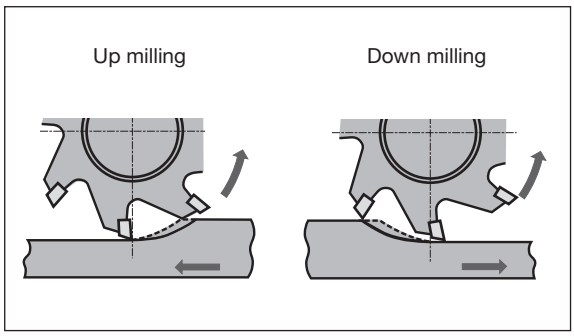

### Types




### Cutting condition of Endmills

#### ● Cutting speed




● **Cutting speed** (Calculated from number of revolutions)

$$v_c = \frac{\pi \times \varnothing D_c \times n}{1000} \quad (\text{m/min})$$

$v_c$ : Cutting speed (m/min)
$\varnothing D_c$ : Effective diameter (mm)
$n$ : Number of revolutions ($\text{min}^{-1}$)
$\pi \approx 3.14$

● **Number of revolution** (Calculated from cutting speed)

$$n = \frac{1000 \times v_c}{\pi \times \varnothing D_c} \quad (\text{min}^{-1})$$

● **Feed speed and feed per tooth**

$$v_f = f_z \times z \times n \quad (\text{mm/min})$$

$v_f$ : Feed speed (mm/min)
$f_z$ : Feed per tooth (mm/t)
$z$ : No. of teeth of the endmills
$n$ : Number of revolutions ($\text{min}^{-1}$)

● **Cutting**

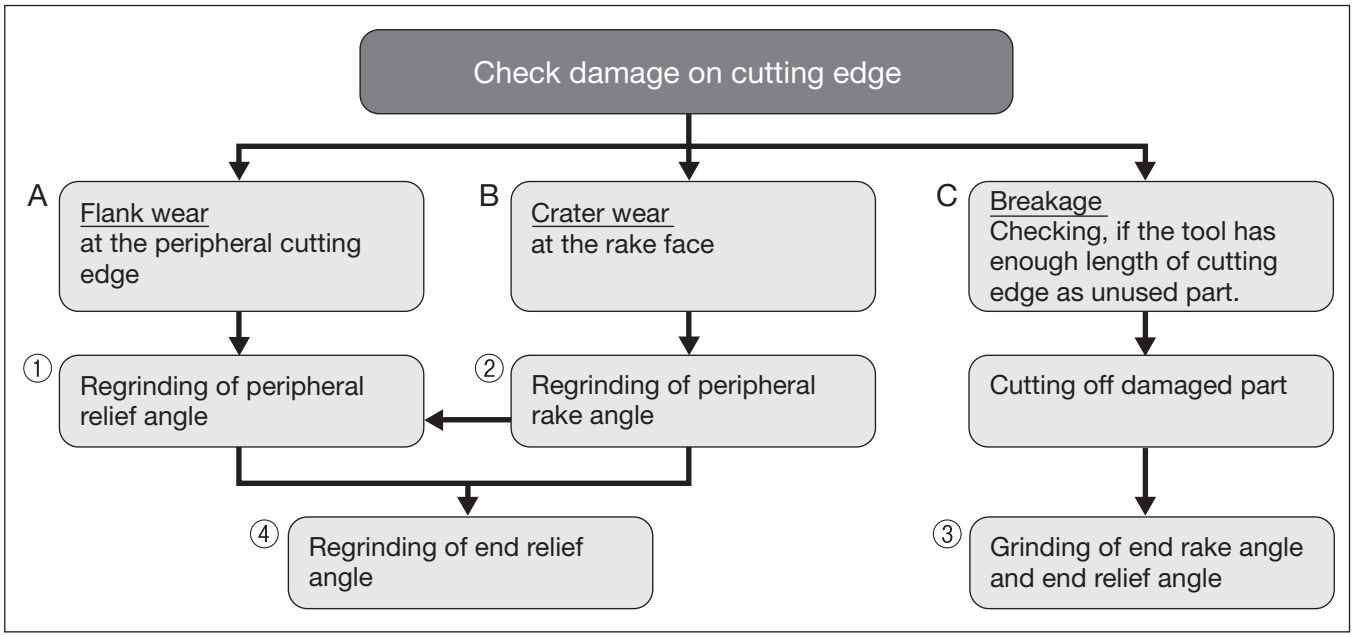
The necessary capacity of the machine is limited by the length of cut edge of the endmill.

● **Up milling and down milling**

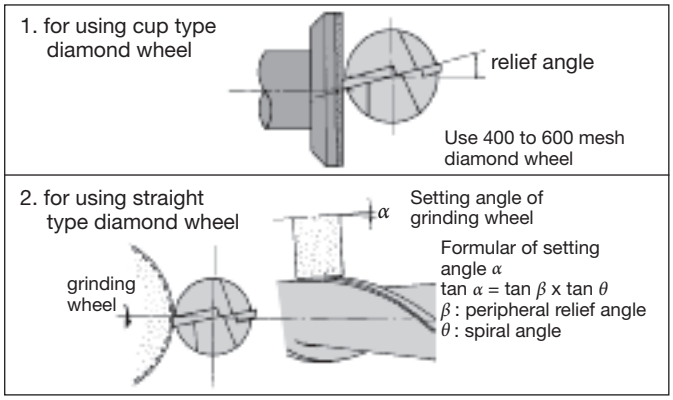
Down milling generally produces better tool life and surface roughness.
In case of cast iron sand inclusion or welding surface, up milling is recommended.

## Solid Carbide Endmills

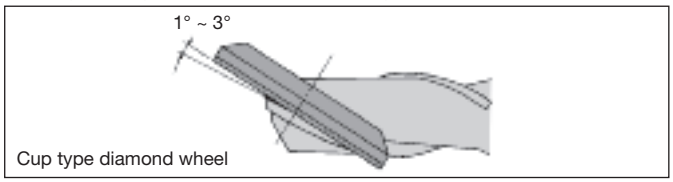
### Regrinding procedures of solid carbide endmill



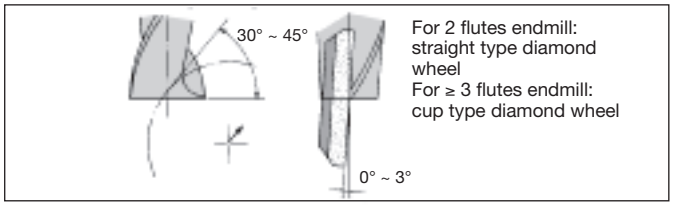

1 Regrinding of end relief angle



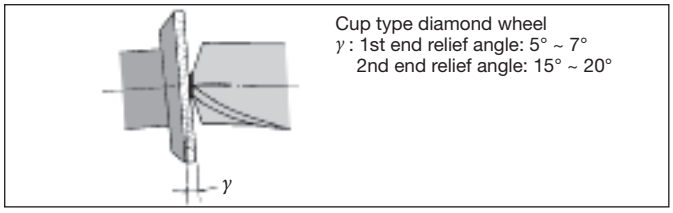

2 Regrinding of peripheral rake angle




3 Regrinding of end rake angle (End gash)




4 Regrinding of end relief angle




Notice of regrinding

(1) If, after checking the damage of the cutting edge, the damage is as case "A" or "B" of the flow chart, the tool must be reground.
Too much damage of the cutting edge requires too much stock removal and thus reduces tool life.

(2) Please use diamond grinding wheel.

(3) Peripheral relief angle must be ground between 18° and 10°.
Relief angle of small diameter cutters for aluminium machining must be a large degree.

(4) First check if "C" in flow chart can be adapted for the case of coated endmill or not.
If procedure "C" can be adapted for regrinding, tool life after the grinding would be more improved than new one. The reason is remaining coated layer of cutting edge and shorter tool length will keep much higher rigidity of the tool than before regrinding.

(5) Please check run out of peripheral cutting edge, face cutting edge, with Vee block after regrinding.
The value of the run out must be controlled within 0.01 mm.

Notice for regrinding of ball nose endmill

- Regrinding of relief angle only is available. The dimension of nose radius will be smaller after grinding.
- Honing of cutting edge is necessary after regrinding.

## Solid Carbide Endmills

### Trouble shooting in Endmilling

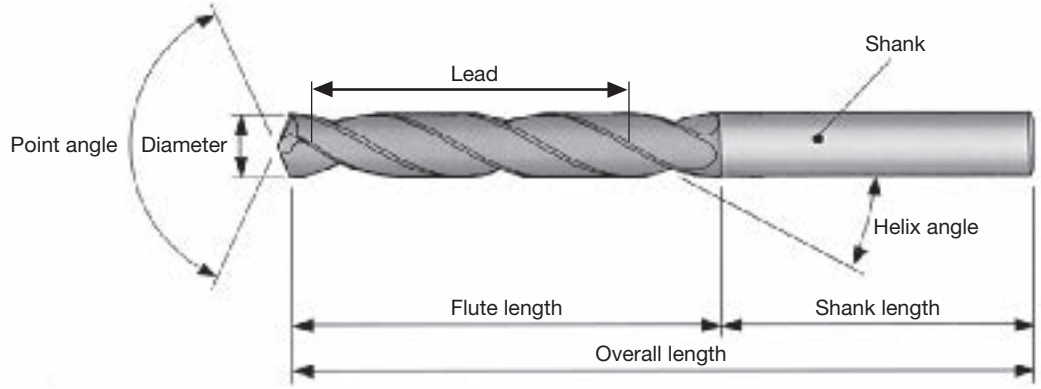
| Trouble | Possible causes | Countermeasures |
|---|---|---|
| **Breakage** (In case of solid carbide endmill and brazed endmill with small diameter) | ● At the start of machining<br>● At the end of machining | ● Reduce feed.<br>● Reduce tool overhang length.<br>● Exchange to short cutting edge tool. |
| | When usual machining | ● Reduce feed.<br>● Managing tool life → Exchange in shorter time.<br>● Replace chuck or collet to new one.<br>● Reduce tool overhang length.<br>● Make optimum honing on the edge.<br>● Reduce flutes. E.g. 4 flutes → 3flutes, or 2flutes.<br>● Use enough coolant. Change direction of supplying coolant. |
| | When change the direction of feed | ● Use the circular interpolation in NC machine. Stop feed shortly before changing.<br>● Lower feed around changing part.<br>● Replace chuck or collet to new one. |
| **Fracture on cutting edge** | Chipping on corner edge | ● Chamfer the corner with hand-stick grinder.<br>● Down cutting ⇒ Upward milling. |
| | Chipping on boundary part | ● Change cutting direction, Down cutting → Upward milling.<br>● Reduce cutting speed. |
| | Chipping on central part or all edges. | ● Make slight honing on the edge. Or make honing bigger.<br>● Change spindle revolution number.<br>● Increase cutting speed.<br>● If chattering, increase feed.<br>● Use coolant or air blast.<br>● Replace chuck or collet to new one.<br>● Decrease cutting speed. |
| | Fracture on cutting edge | ● Decrease feed.<br>● Reduce flutes. E.g. 4 flutes → 3flutes, or 2flutes.<br>● Make slight honing on the edge. Or make honing bigger.<br>● Replace chuck or collet to new one.<br>**【For Solid carbide endmill】**<br>● Decrease cutting speed.<br>● Use enough coolant. Change direction of supplying coolant. |
| **Large wear in short time** | | ● Decrease cutting speed.<br>● Change cutting direction, Upward milling → down cutting.<br>● Increase feed.<br>● Use coolant or air blast.<br>● In reground tool, grind flank face with FINER wheel. |

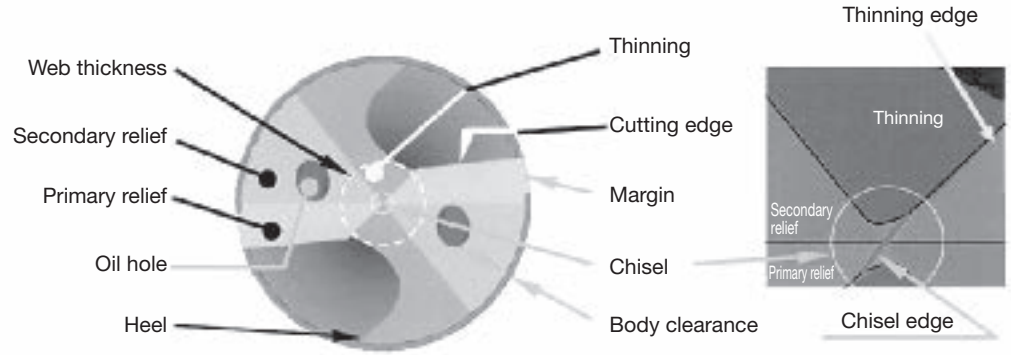
(Continued on next page)

| Trouble | Possible causes | Countermeasures |
|---|---|---|
| Poor surface finish | Bright, but Wavy surface | ● Reduce feed per tooth.<br>● Increase flutes; E.g. 2 flutes → 3flutes, or 4flutes. |
| | Small chips are welded on surface. | ● Increase cutting speed.<br>● Use coolant or air blast, or increase coolant.<br>● Make slight honing on the edge.<br>● Upward milling → Down cutting.<br>● Increase feed per tooth. Increase Depth of Cut. |
| | Scratches on the surface | ● Make slight honing on the edge.<br>● Use non-water soluble coolant.<br>● Down cutting → Upward milling. |
| | Poor surface by over cutting | ● Reduce depth of cut.<br>● Increase cutting speed.<br>● Reduce feed per tooth. |
| Poor accuracy | Finish size becomes a minus tendency. | ● Upward milling → Down cutting.<br>● Reduce depth of cut.<br>● Replace chuck or collet to new one.<br>● Reduce overhang length.<br>● Increase cutting speed. |
| | Poor straightness | ● Reduce depth of cut.<br>● Replace chuck or collet to new one.<br>● Reduce overhang length.<br>● Increase cutting speed.<br>● Increase flutes; E.g. 2 flutes → 4flutes.<br>● Reduce feed per tooth.<br>● Check the edge. Change tool, when needed. |
| Chattering | | ● Increase feed per tooth.<br>Reduce feed per tooth, when current feed is more than 0.07 mm/t.<br>● Change cutting speed.<br>● Replace chuck or collet to new one.<br>● Reduce overhang length.<br>● Use 2 flutes tool in roughing. Use 4 flutes tool in finishing.<br>● Down cutting → Upward milling. |

## Drilling Tools

### Nomenclature for solid carbide drills




### Cutting forces and power requirement

● **Twist drill**

**Power requirement**

$$P_C = K \varnothing D_C^2 n \quad (0.647 + 17.29f) \times 10^{-6} \ \text{(kW)}$$

**Thrust force**

$$T_C = 570 K \varnothing D_C f^{0.85} \ \text{(N)}$$

**Torque**

$$M_C = \frac{K \varnothing D_C^2 (0.630 + 16.84f)}{100} \ \text{(N·m)}$$

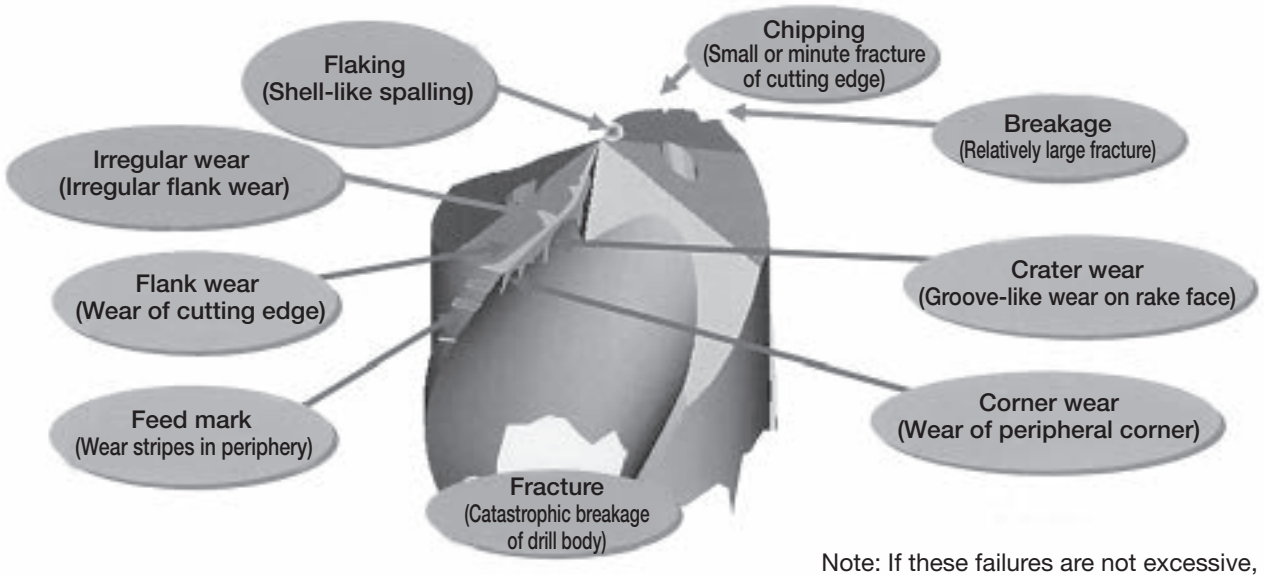
$P_C$ : Power requirement (kW)
$T_C$ : Thrust force (N)
$M_C$ : Torque (N·m)
$\varnothing D_C$ : Drill diameter (mm)
$f$ : Feed (mm/rev)
$n$ : No. of revolutions ($min^{-1}$)
$K$ : Material constant···· Refer to the Table at right

●Material constant compensating for power requirement and thrust force

| Workpiece material | Tensile strength | | Brinell hardness (HB) | Material constant (*K*) |
|---|---|---|---|---|
| | MPa (N/mm²) | Kgf/mm² | | |
| Cast iron | 210 | 21 | 177 | 1.00 |
| Cast iron | 280 | 28 | 198 | 1.39 |
| Cast iron | 350 | 35 | 224 | 1.88 |
| Aluminium | 250 | 25 | 100 | 1.01 |
| Low carbon steel (JIS S20C) | 550 | 55 | 160 | 2.22 |
| Free cutting steel (JIS SUM32) | 620 | 62 | 183 | 1.42 |
| Manganese steel (JIS SMn438) | 630 | 63 | 197 | 1.45 |
| Nickel chromium steel (JIS SNC236) | 690 | 69 | 174 | 2.02 |
| 4115 steel Cr0.5, Mo0.11, Mn0.8 | 630 | 63 | 167 | 1.62 |
| Chromium molybdenum steel (JIS SCM430) | 770 | 77 | 229 | 2.10 |
| Chromium molybdenum steel (JIS SCM440) | 940 | 94 | 269 | 2.41 |
| Nickel chromium molybdenum steel (JIS SNCM420) | 750 | 75 | 212 | 2.12 |
| Nickel chromium molybdenum steel (JIS SNCM625) | 1,400 | 140 | 390 | 3.44 |
| Chromium vanadium steel | | | | |
| Cr0.6, Mn0.6, V0.12 | 580 | 58 | 174 | 2.08 |
| Cr0.8, Mn0.8, V0.1 | 800 | 80 | 255 | 2.22 |

Drilling Tools

## Cutting edge failure of solid carbide drills



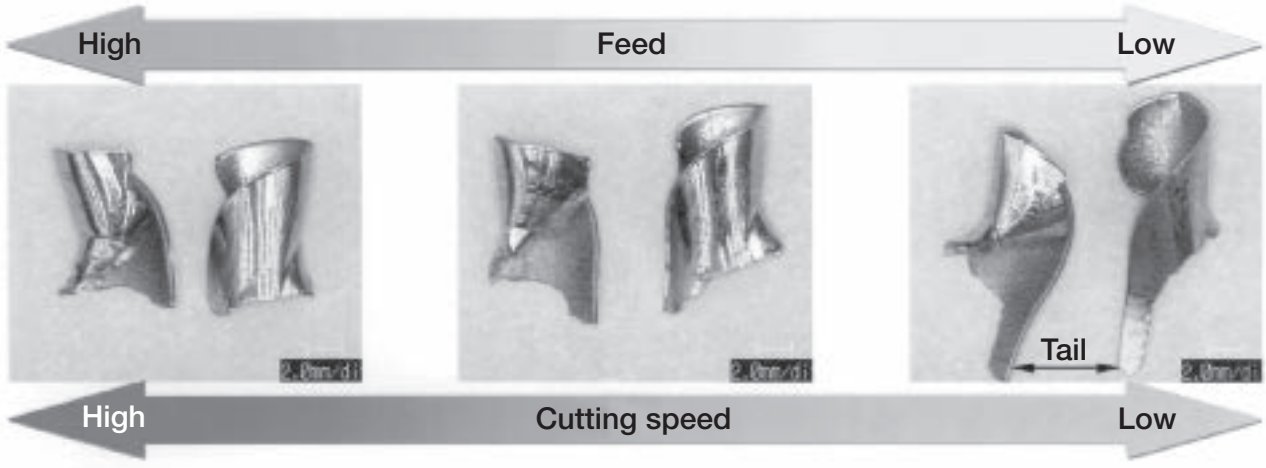

Note: If these failures are not excessive, the tool is in a normal condition.

## Change of chip shapes in drilling

### ● Change of chip shapes relating to cutting conditions

Photographs below show the change of chip shapes relating to change of the feed and the cutting speed. These chip shapes are all well controlled in a proper condition range.

When the speed and feed are low, the chip shows whitish colour and the tail of the chip tends to lengthen gradually. In contrast, as the speed or the feed increases, the chip tends to increase in brightness and becomes a compact shape with a short tail. These changes in the shape depend on the cutting temperature. As the temperature increases, chips tend to be broken.



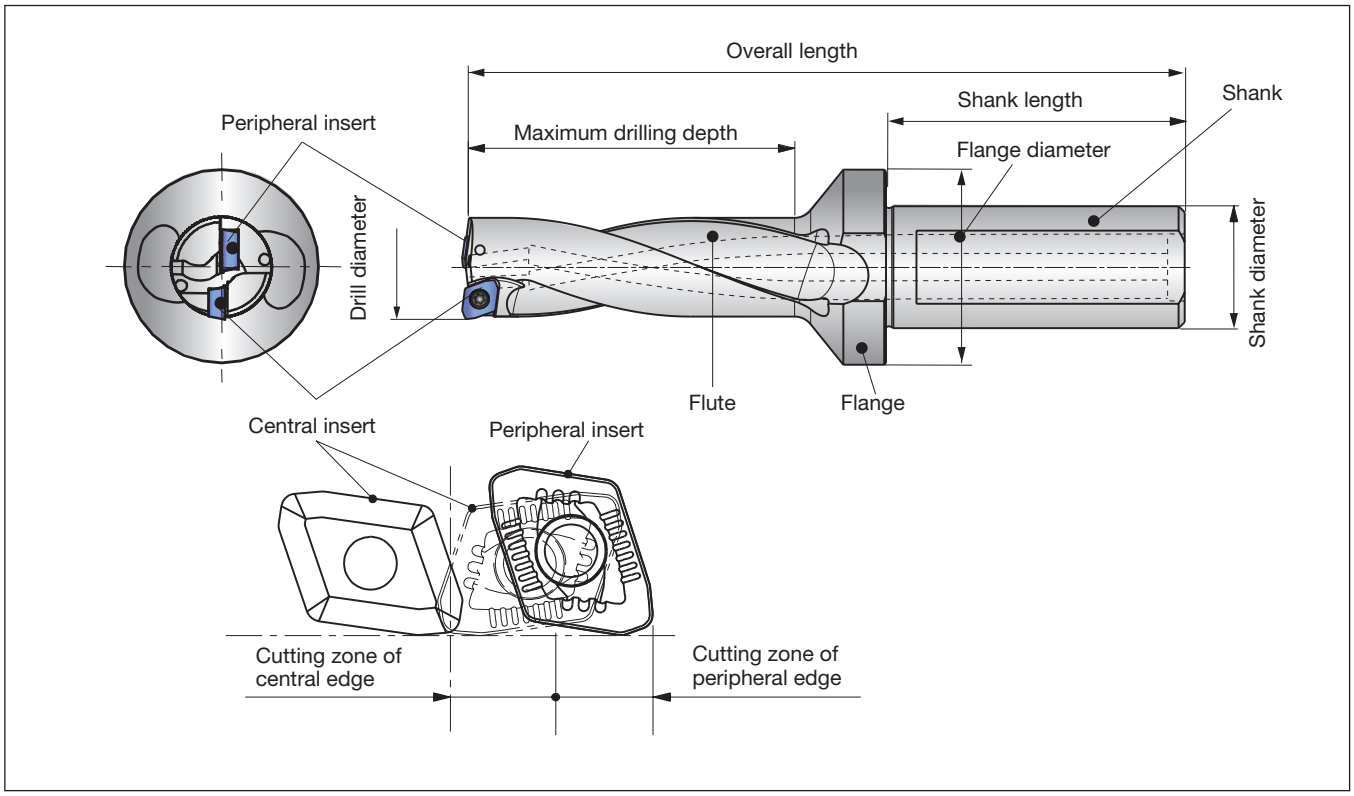
## Drilling Tools

### Troubleshooting for solid carbide drills

| Problem | | Cause | Countermeasure |
|---|---|---|---|
| Abnormal wear | Relief surface | Inappropriate cutting speed | •Increase the cutting speed by 10 % within standard conditions if abnormal wear is around center.<br>•Lower the cutting speed by 10 % within standard conditions if abnormal wear is on the periphery. |
| | | Inappropriate cutting fluid | •Check the filter.<br>•Use the cutting fluid superior in lubricity. (Increase the dilution rate) |
| | Margin | Inappropriate cutting speed | •Lower the cutting speed by 10 %. |
| | | Regrinding timing, insufficient reground amount | •Shorten the regrinding timing. |
| | | Insufficient rigidity of the machine and workpiece | •Change the clamp method to the one with rigidity. |
| | | Insufficient drill rigidity | •Use smallest possible overhang. |
| | | Inappropriate cutting fluid | •Check the filter.<br>•Use the cutting fluid superior in lubricity. (increase the dilution rate) |
| | | Intermittent cutting when entering | •Avoid interruption at entry and exit.<br>•Lower the feed by about 50 % during entering into and leaving from the workpiece. |
| Chipping and fracture | Chisel section (center of drill cutting edge) | Insufficient rigidity of the drill | •Reduce the drill overhang as much as possible.<br>•Increase the feed at entry when the low speed feed is selected in standard cutting condition range.<br>•Use a bushing or a center drill. |
| | | Insufficient rigidity of the machine and workpiece | •Change the clamp method to the one with rigidity. |
| | | Inappropriate entry into the workpiece | •Avoid interruption at entry into the workpiece.<br>•Lower the feed by 10 % at entry. |
| | | High workpiece hardness | •Lower the feed by 10 %. |
| | | Inappropriate honing | •Check if honing has been made to the center of cutting edge. |
| | Peripheral cutting edge | Insufficient drill rigidity | •Lower the cutting speed by 10 %.<br>•Increase the feed at entry when the low speed feed is selected in standard cutting condition range. |
| | | Inappropriate drill mounting accuracy | •Check the run out accuracy after drill installation. (0.03 mm or less) |
| | | Insufficient machinery and workpiece rigidity | •Change the clamp method to the one with rigidity.<br>•Lower the feed during entering into and leaving from the workpiece. |
| | | Inappropriate honing | •Check if honing has been made to the cutting edge periphery. |
| | Margin | Insufficient machine and workpiece rigidity | •Change the clamp method to the one with rigidity. |
| | | Insufficient drill rigidity | •Use smallest possible overhang.<br>•Use a bushing or center drill. |
| | | Regrinding timing and insufficient amount of reground stock | •Shorten the regrinding timing. |
| | | Intermittent cutting when entering or exiting the cut | •Avoid interruption at entry and exit.<br>•Lower the feed by about 50 % during entering into and leaving from the workpiece. |
| Breakage | | Tendency to cause chipping or develop abnormal wear | •Check the failure mode condition before breakage and find out the wear and chip countermeasures. |
| | | Chip packing in the drill flutes | •Review the cutting conditions.<br>•For internal coolant supply, raise the supply pressure of cutting fluid.<br>•Use peck feed for deep holes. |
| | | Insufficient machine output | •Review the cutting conditions.<br>•Use the machine with high power. |
| Insufficient hole accuracy | | Insufficient rigidity of the machinery and workpiece | •Change to the clamp method with rigidity |
| | | Inappropriate drill installation accuracy | •Check the run out accuracy of drill mounting. (0.03 mm or less) |
| | | Chip packing in the flutes. | •Review the cutting conditions.<br>•Raise the cutting oil supply pressure.<br>•Use peck-feed for deep holes. |
| | | Inappropriate edge sharpening accuracy | •Check the edge shape accuracy. |
| Prolonged chips | | Inappropriate cutting conditions | •Increase the feed by 10 % within standard conditions. |
| | | Inappropriate honing | •Provide the appropriate honing. |
| | | Cutting edge with chipping or breakage | •Lower the cutting speed by 10 %. |

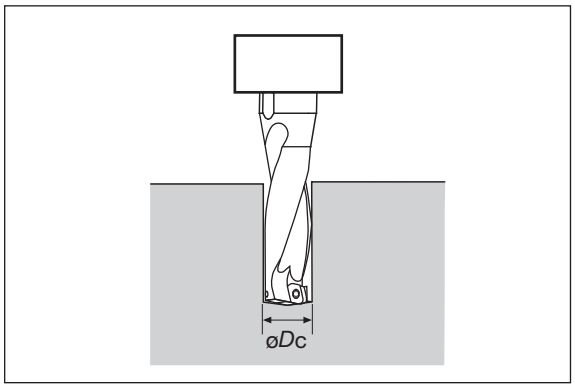
Drilling Tools

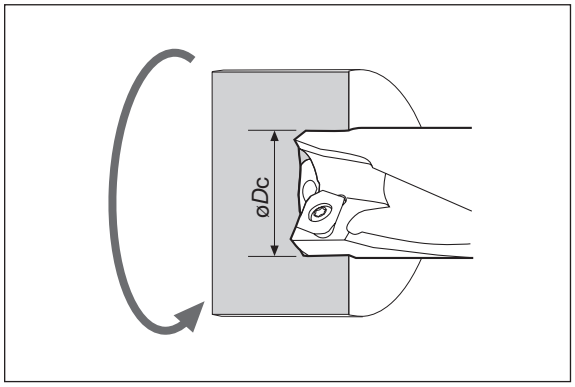
## Nomenclature for Indexable drill




## Calculation formulas for Indexable drill

### ●Cutting speed




**●When calculating cutting speed from number of revolutions: (Drilling formulas)**

$$v_c\ (\text{m/min}) = \frac{\pi \times \varnothing D_c \times n}{1000}$$

$v_c$ : Cutting speed (m/min)
$\varnothing D_c$ : Drill diameter (mm)
$n$ : Number of revolution ($\text{min}^{-1}$)
$\pi \approx 3.14$

**●When calculating required number of revolutions from cutting speed: (Drilling formulas)**

$$n\ (\text{min}^{-1}) = \frac{1000 \times v_c}{\pi \times \varnothing D_c}$$

**●When calculating cutting speed from number of revolutions: (Where the workpiece rotates.)**

$$v_c\ (\text{m/min}) = \frac{\pi \times \varnothing D_c \times n}{1000}$$

$v_c$ : Cutting speed (m/min)
$\varnothing D_c$ : Drilling diameter (mm)
$n$ : Number of revolution ($\text{min}^{-1}$)
$\pi \approx 3.14$

**●When calculating required number of revolutions from cutting speed: (Where the workpiece rotates.)**

$$n\ (\text{min}^{-1}) = \frac{1000 \times v_c}{\pi \times \varnothing D_c}$$

**●Calculation of feed speed**

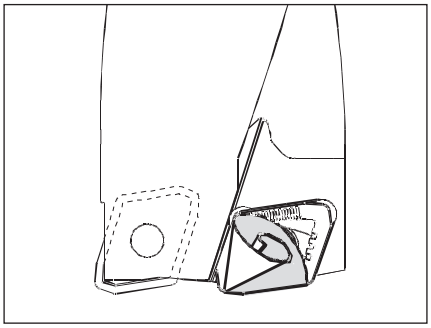
$$v_f\ (\text{mm/min}) = f \times n$$

$v_f$ : Feed speed (mm/min)
$f$ : Feed (mm/rev)
$n$ : Number of revolution ($\text{min}^{-1}$)

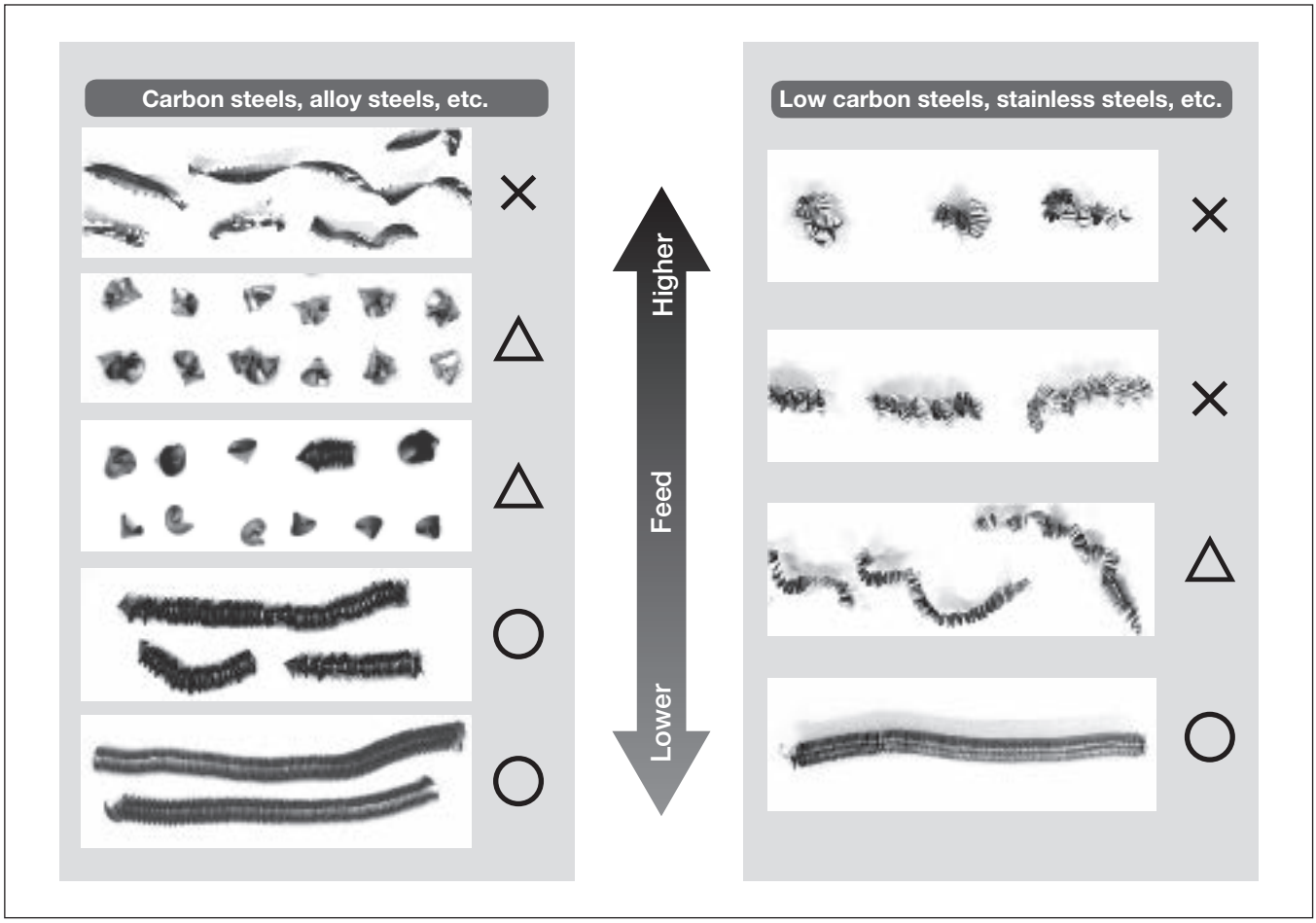
## Chip shapes

### ● Chip shape produced with central insert

- A conical coil shape whose apex point coincides with the rotating center of the drill is the basic shape. The chips are broken into small sections with increases in feed. However, excessively high feed causes the chip to increase in thickness and develops vibration which disturbs stable machining.
- In TDX drills, ○ marked chips shown below are the most preferable shapes. This type of chip is broken into adequate lengths by centrifugal forces when used in tool-rotating condition. On the other hand, when used in work-rotating condition such as on a lathe, a continuously long chip is often produced without entangling.

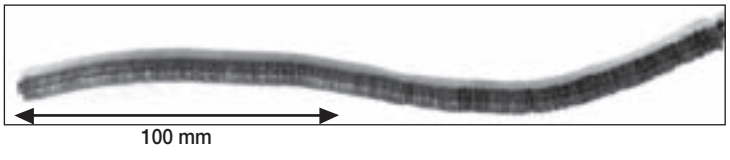


### ● Relation between chip shapes and feeds (In the case of central insert)




### ● Example of chip shape in work-rotating applications (In the case of central insert)

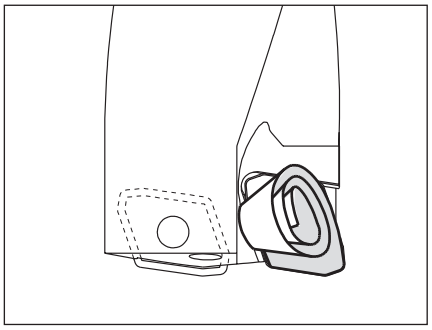
(ø26, S45C, $V_c$ = 100 m/min, $f$ = 0.1 mm/rev)



Drilling Tools

## ● Chip shape produced with peripheral insert

- Chip problems such as entangling are mainly caused by chips produced with the peripheral insert. These problems are dependent on the types of Workpiece material and the cutting conditions.
- As shown below, when the feed is extremely low, the chips jump over the chipbreaker groove and the continuously long chips may wrap around the drill body.
- When the feed is too high, the chips increase in thickness and can not be curled.
- Therefore, it is important to select proper cutting conditions to suit the machining so that well controlled chips will be formed.



### Medium to high carbon steels, alloy steels, etc.

As shown below, several turns of coil are an ideal shape.
As the feed increases, the curl radius and the number of turns tend to decrease.

## ● Typical chip shapes of general steels



## ● Variation of chip shapes relating to feeds

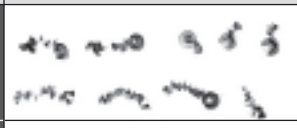
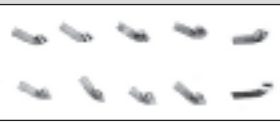
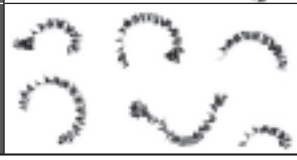


*f* = 0.07 mm/rev　　*f* = 0.1 mm/rev　　*f* = 0.13 mm/rev

### Stainless steels, low-carbon steels, low-alloy steels, etc.

- When machining long-chip materials such as stainless steels and mild steels, the wrong selection of cutting conditions results in chip entangling and tool breakage at worst. Therefore, cutting conditions should be carefully selected.
- "C" shaped, continuous coils of several to ten turns having adequately divided lengths are the ideal shape.

## ● Ideal chip shapes

| | Stainless steel (JIS SUS 304) ( ø22, *Vc* = 100 m/min, *f* = 0.1 mm/rev ) | Mild steel (JIS SS400) ( ø22, *Vc* = 160 m/min, *f* = 0.08 mm/rev ) |
|---|---|---|
| DS chipbreaker |  |  |
| DJ chipbreaker |  |  |

For machining stainless steels or low carbon steels, DS chipbreaker is recommended.
When using a TDX drill in tool-rotating condition, DS chipbreaker produces compact chips and allows more stable machining than DJ chipbreaker. When using it in work-rotating condition, DS chipbreaker provides outstanding affect on chip control.

Drilling Tools

## ● Chip shapes which tend to entangle and remedies against them

### ① Apple-peel-like chips

These chips are often produced in machining mild steels or low-carbon steels at low-speeds and low-feeds.

**Remedies**

Increase the cutting speed in stages by 20% within the range of standard cutting conditions. If there is no effect, increase the feed by about 10 % as the cutting speed is raised by 20%.



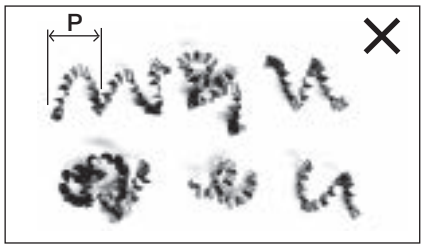
Apple-peel-like chips (Without curling)

### ② Short-lead chips

These chips are often produced in machining stainless steels at low-feeds and tend to entangle to the tool in spite of short length.

**Remedies**

Increase the feed by about 10 %. If there is no effect, increase the cutting speed in stages by 10% within the range of standard cutting conditions.



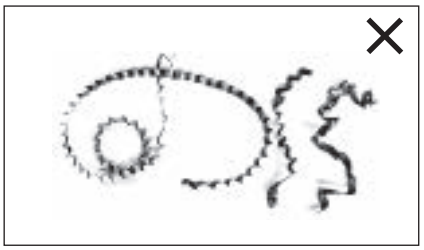

Continuously curled "C" shape chips with short lead (P).

### ③ Very long chips

Often produced in machining mild steels or low-carbon steels under improper cutting conditions.

**Remedies**

Increase the cutting speed in stages by 20% within the range of standard cutting conditions. If there is no effect, decrease the feed by about 10 % as the cutting speed is raised by 20%.

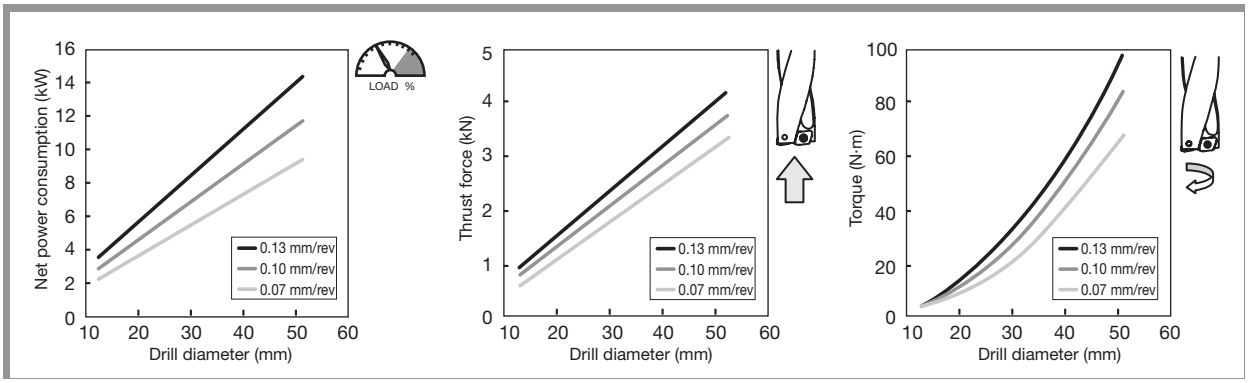


Continuously coiled long chips

## Cutting forces

The charts below show a guideline for cutting forces. Use TDX drills on a machine with ample power and sufficient rigidity.

## ● Guidelines for cutting forces




Cutting speed: $V_c$ = 100 m/min
Workpiece material: Alloy steel (JIS SCM440), 240HB
Cutting fluid: Used

## Drilling Tools

### Troubleshooting for indexable drills

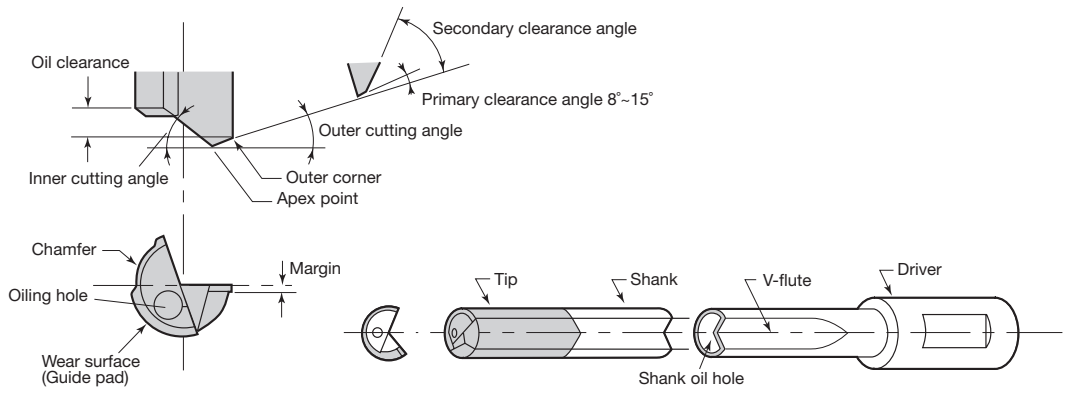
| Problem | | | Cause | Countermeasure |
|---|---|---|---|---|
| Abnormal wear | Central cutting edge | Relief surface | Inappropriate cutting conditions | ● Increase the cutting speed by 10 % within standard conditions.<br>● Lower the feed by 10 %. |
| | Peripheral cutting edge | Relief surface | Inappropriate cutting conditions | ● Increase the cutting speed by 10 % within standard conditions.<br>● When the feed is extremely low or high, set up it within standard conditions. |
| | Common | Relief surface | Varieties and supply of cutting fluid | ● Confirm that the cutting fluid flow is higher than 7 liter/min.<br>● The concentration of cutting fluid must be higher than 5 %.<br>● Use the cutting fluid superior in lubricity.<br>● Change to internal cutting fluid supply from external one. |
| | | | Vibration in drilling | ● Change to the machine with higher torque.<br>● Change to the clamp method with rigidity.<br>● Change the drill setting method. |
| | | | Unsuitable for selection of grade | ● Change the grade to high wear resistant. |
| | | | Looseness of screws | ● Tighten the screw. |
| | | Crater | Cutting heat is too high | ● Change to internal cutting fluid supply from external one.<br>● Increase the supply rate of the cutting fluid. (Higher than 10 liter/min.)<br>● Lower the feed by 20 % within standard conditions.<br>● Lower the cutting speed by 20 % within standard conditions. |
| | | | Excessive chip welding | ● Lower the feed by 20 % within standard conditions.<br>● Lower the cutting speed by 20 % within standard conditions. |
| | | Chipbreaker | Chip packing | ● Increase the cutting speed by 20% and lower the feed by 20% within standard conditions.<br>● Raise the fluid pressure (for higher than 1.5 MPa). |
| Chipping and fracture | Central cutting edge | The rotation center of drill | Misalignment for workpiece rotation | ● Set the misalignment to 0 ~ 0.2 mm. |
| | | | Large offset | ● Check the manual and use the tool in the allowable offset range. |
| | | | No flatness of machined surface | ● Flatten the entry surface in pre-machining.<br>● Set the feed for lower than 0.05 mm/rev in rough surface area. |
| | | | High feed | ● Lower the feed by 20 ~ 50 % within standard conditions. |
| | | | Using a chipping corner | ● Confirm the corner when exchanging inserts. |
| | Peripheral cutting edge | Peripheral corner area | Using inserts in excess of tool-life | ● Exchange the corner or the insert before the nose wear reaches 0.3 mm. |
| | | | No flatness of machined surface | ● Flatten the entry surface in pre-machining.<br>● Set the feed for lower than 0.05 mm/rev at rough surface area. |
| | | | The existence of interrupted area | ● Set the feed for lower than 0.05 mm/rev in interrupted area. |
| | | | Using a chipped corner | ● Confirm the corner when exchanging inserts. |
| | Common | The unused corner area and cutting edge | High hardness of workpiece | ● Increase the cutting speed by 20 % and lower the feed by 20 % within standard conditions.<br>● Raise the fluid pressure (for higher than 1.5 MPa). |
| | | | Chip packing | ● Lower the feed by 20 % within standard conditions. |
| | | | Machinery impact | ● Change to continuous feed in case of pick feeding. |
| | | Contact boundary | Using inserts in excess of tool-life | ● Exchange the corner or the insert before the nose wear reaches 0.3 mm. |
| | | | Vibration in drilling | ● Change to the machine with higher rigidity.<br>● Change to the clamp method with rigidity.<br>● Change the drill setting method. |
| | | Flaking | High hardness of workpiece | ● Set the feed for lower than 0.05 mm/rev. |
| | | | Thermal impact | ● Change to internal cutting fluid supply from external one.<br>● Lower the feed by 20 % within standard conditions. |
| | | Common | Unsuitable for selection of grade | ● Change the grade to toughress. |
| | | | Looseness of screws | ● Tighten the screw. |

## Drilling Tools

| Problem | | Cause | Countermeasure |
|---|---|---|---|
| Scratch marks on the tool | The tool periphery | Misalignment of workpiece rotation | ● Set the misalignment to 0 ~ 0.2 mm. |
| | | Offset machining in excess of allowable range | ● Use the tool in the allowable offset range. |
| | | Offset direction reduced diameter of workpiece | ● Set offset direction extended diameter of workpiece |
| | | No flatness of the entry surface | ● Flatten the entry surface in pre-machining.<br>● Set the feed for lower than 0.05 mm/rev in rough surface area. |
| | | Chipping of peripheral cutting edge | ● Exchange the insert. |
| | | Bend of workpiece | ● Change to the clamp method with rigidity. |
| | | Chip packing | ● Increase the cutting speed by 20 % and lower the feed by 20 % within standard conditions.<br>● Raise the fluid pressure (for higher than 1.5 MPa). |
| Inappropriate hole accuracy | Hole diameter | Misalignment for workpiece rotation | ● Set the misalignment to 0 ~ 0.2 mm. |
| | | Inappropriate offset contents | ● Adjust offset contents. |
| | | No flatness of the entry surface | ● Flatten the entry surface in pre-machining.<br>● Set the feed for lower than 0.05 mm/rev at rough surface area. |
| | | Bend of workpiece | ● Change to the clamp method with rigidity. |
| | Roughness | Varieties and supply of cutting fluid | ● The concentration of cutting fluid must be higher than 5 %.<br>● Use the cutting fluid superior in lubricity.<br>● Change to internal cutting fluid supply from external one. |
| | | Inappropriate cutting conditions | ● Increase the cutting speed by 20 % within standard conditions.<br>● Lower the feed by 20 % within standard conditions. |
| | Common | Failures of inserts | ● Exchange the insert. |
| | | Chip packing | ● Increase the cutting speed by 20 % and lower the feed by 20 % within standard conditions.<br>● Raise the fluid pressure (for higher than 1.5 MPa). |
| | | Looseness of screws | ● Tighten the screw. |
| Chip control | Prolonged and twisted of chips | Inappropriate cutting conditions | ● Work within standard conditions.<br>● Increase the cutting speed by 10 % within standard conditions.<br>● Increase the feed by 10 % within standard conditions. |
| | | Failures of inserts | ● Exchange inserts. |
| | | Machining by external fluid supply | ● Change to internal cutting fluid supply from external one.<br>● Work by step feed.<br>● Use dwell function for 0.1 sec approximately. |
| | | Chips around the central cutting edge | ● There is a tendency to shorten the chips when shifting to higher speed and feed. |
| | Chip packing | Fluid supply | ● Change to internal cutting fluid supply from external one.<br>● Raise the fluid pressure (for higher than 1.5 MPa). |
| | | Inappropriate cutting conditions | ● Increase the cutting speed by 20 % and lower the feed by 20 % within standard conditions.<br>● Raise the fluid pressure (for higher than 1.5 MPa). |
| | Common | Large failure of drill holders | ● Exchange the drill holder. |
| | | Looseness of screws | ● Tighten the screw. |
| Others | Chatter | Inappropriate cutting conditionss | ● Lower the cutting speed by 20 % within standard conditions.<br>● Increase the feed by 10 % within standard conditions. |
| | | Large wear of inserts | ● Exchange the insert. |
| | | Vibration in drilling | ● Change to the machine with higher torque rigidity.<br>● Change to the clamp method with rigidity.<br>● Change the drill setting method. |
| | | Looseness of screws | ● Tighten the screw. |
| | Machine stop | Insufficient machine power and torque | ● Use the range of number of revolutions suited machine spec. Lower the feed by 20 ~ 50%. |
| | | Burned inserts | ● Exchange inserts before the failure becomes larger.<br>● Check the oil-hole plug screw is tightly screwed in place.<br>● Check that the fluid flows powerfully from the drill.<br>● Lower the cutting speed and the feed by 20 % within standard conditions. |
| | Large burr | Failures of inserts | ● Exchange the insert. |
| | | Inappropriate cutting conditions | ● Lower the feed by 20 ~ 50% just before leaving from the workpiece. |

## Drilling Tools

### Nomenclature for gun drill




### Troubleshooting in gun drilling

| Problem | | Cause | | Countermeasure |
|---|---|---|---|---|
| Breaking of drill | At entry into workpiece | Machine | Clamping the workpiece is unstable. | Clamp the workpiece firmly. |
| | | | The guide bush is apart from the workpiece surface at the entry. | Contact the guide bush closely with the workpiece. |
| | | | The machine's rapid feed is used. | Use cutting feed. |
| | | | Whipping effect occurs. | Place a whip guide at the appropriate position. |
| | | | The shape of the guide bush is not suitable. | Use the guide bush in the shape suitable for the workpiece. |
| | | Drill | The drill is not set properly. | Set the drill with an appropriate torque, hydraulic pressure, etc. |
| | | | Regrinding is in poor quality. | Make sure no damage is left on the drill and that the cutting edge geometry is not changed. |
| | | Cutting condition | The feed (*f*) is too high. | Use low feed. |
| | | Workpiece | The workpiece surface is slanted. | Use low feed. |
| | During drilling | Machine | Clamping the workpiece is unstable. | Clamp the workpiece firmly. |
| | | | The shape of the guide bush is not suitable. | Modify the shape of the guide bush. See "Chip packing" for the details. |
| | | | The feed speed (*Vf*) varies. | Use mechanical feed. |
| | | | The number of revolutions varies (decreases). | Increase the machine power or adjust the cutting conditions. |
| | | Drill | Abnormal damage occurs. | See "Short tool life" for the details. |
| | | Cutting condition | The feed (*f*) is not suitable. | Use an appropriate feed. |
| | | Workpiece | Interrupted or cross drilling is required. | Change the tool to a standard gundrill. |
| | | Others | Chip packing occurs. | See "Chip packing" for the details. |
| | At exit from workpiece | Drill | The tip is too long. | Make the tip length short. |
| | | | The selection of the guide pads is not suitable. | Use 2 guide pads instead of 3. |
| | | | The clearance of the coolant hole is too large. | Reduce the clearance of the coolant hole. |
| | | Cutting condition | The feed (*f*) is too high. | Use low feed. |
| | | Workpiece | The workpiece surface is slanted. | Use low feed. |
| | During retracting | Machine | Clamping the workpiece is unstable. | Clamp the workpiece firmly. |
| | | Cutting condition | Burnishing torque (cutting power) is increased due to reduced hole diameter. | Reduce cutting speed (*Vc*). |

Drilling Tools

## Troubleshooting in gun drilling

| Problem | | Cause | | Countermeasure |
|---|---|---|---|---|
| Hole accuracy | Rough surface finish | Machine | Clamping the workpiece is unstable. | Clamp the workpiece firmly. |
| | | | The type of coolant is not appropriate. | Use water-insoluble coolant. |
| | | | Foreign material is in the coolant. | Thoroughly filtrate the coolant (Use a filter with the filtration accuracy in 10μm or less). |
| | | | The run-out of the spindle is too large. | Minimize the run-out of the spindle. |
| | | | The clearance between the guide bush and the drill is not appropriate. | Replace the guide bush (The clearance should be between +0.003 and +0.008). |
| | | | The feed speed (*Vf*) varies. | Use mechanical feed. |
| | | | The number of revolutions varies (decreases). | Increase the machine power or adjust the cutting conditions. |
| | | Drill | Abnormal damage occurs. | See "Short tool life" for the details. |
| | | | Regrinding is in poor quality. | Make sure no damage is left on the drill and that the cutting edge geometry is not changed. |
| | | Cutting condition | The feed (*f*) is too high. | Reduce the feed. |
| | | Others | Chip packing occurs. | See "Chip packing" for the details. |
| | Unacceptable circularity, cyndricity, and oversize | Machine | The clearance between the guide bush and the drill is not appropriate. | Replace the guide bush (The clearance should be between +0.003 and +0.008). |
| | | | The guide bush is apart from the workpiece surface at the entry. | Contact the guide bush closely with the workpiece. |
| | | | The type of coolant is not appropriate. | Use water-insoluble coolant. |
| | | | The concentricity of the guide bush and the spindle is too large. | Decrease the concentricity of the guide bush and the spindle. |
| | | Drill | Abnormal damage occurs. | See "Short tool life" for the details. |
| | | | Regrinding is in poor quality. | Make sure no damage is left on the drill and that the cutting edge geometry is not changed. |
| | | Cutting condition | The feed (*f*) is not suitable. | Use an appropriate feed. |
| | | Workpiece | Interrupted or cross drilling is required. | Change the tool to a standard gundrill. |
| | | Others | Chip packing occurs. | See "Chip packing" for the details. |
| | Bending of hole | Machine | Clamping the workpiece is unstable. | Clamp the workpiece firmly. |
| | | | The guide bush is apart from the workpiece surface at the entry. | Contact the guide bush closely with the workpiece. |
| | | | The concentricity of the guide bush and the spindle is too large. | Decrease the concentricity of the guide bush and the spindle. |
| | | | The clearance between the guide bush and the drill is not appropriate. | Replace the guide bush (The clearance should be between +0.003 and +0.008). |
| | | Drill | The selection of the guide pads is not suitable. | Use 2 guide pads instead of 3. |
| | | | Regrinding is in poor quality. | Make sure no damage is left on the drill and that the cutting edge geometry is not changed. |
| | | Cutting condition | The feed (*f*) is too high. | Reduce the feed. |
| | | Workpiece | The workpiece has blow holes or unevenness. | Use the workpiece without defect. |
| | | | The workpiece surface is slanted at the entry. | Use low feed. |
| | | | Interrupted or cross drilling is required. | Change the tool to a standard gundrill. |

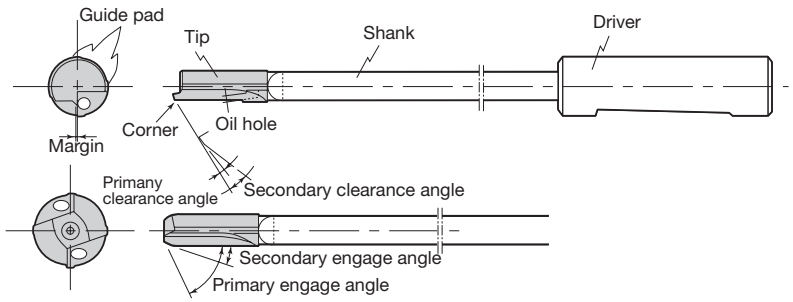
Drilling Tools

## Troubleshooting in gun drilling

| Problem | | Cause | | Countermeasure |
|---|---|---|---|---|
| Short tool life | Abnormal wear | Machine | The type of coolant is not appropriate. | Use water-insoluble coolant. |
| | | | Foreign material is in the coolant. | Thoroughly filtrate the coolant (Use a filter with the filtration accuracy in 10μm or less). |
| | | | The clearance between the guide bush and the drill is not appropriate. | Replace the guide bush (The clearance should be between +0.003 and +0.008). |
| | | | Whipping effect occurs. | Place a whip guide at the appropriate position. |
| | | | The concentricity of the guide bush and the spindle is too large. | Decrease the concentricity of the guide bush and the spindle. |
| | | | The coolant temperature is too high. | Increase the capacity of the tank. |
| | | Drill | The selection of the guide pads is not suitable. | Use 2 guide pads instead of 3. |
| | | | Regrinding is in poor quality. | Make sure no damage is left on the drill and that the cutting edge geometry is not changed. |
| | | | The drill's overall length is excessive. | Reduce the drill's overall length. |
| | | | Excessive wear occurs and the chip shape changes. | Regrind the gundrill (ease the tool life criteria). |
| | | Cutting condition | The cutting speed (*Vc*) is too high. | Reduce the cutting speed. |
| | | | The feed (*f*) is too high. | Reduce the feed. |
| | | | The coolant pressure is not high enough. | Increase the coolant pressure. |
| | | Workpiece | The material quality varies. | Reduce the cutting speed (*Vc*). |
| Chip control | Chip packing | Machine | The shape of the guide bush is not suitable. | Modify the tip of the guide bush to match the shape of the workpiece surface at the entry. |
| | | | The number of revolutions varies (decreases). | Increase the machine power or adjust the cutting conditions. |
| | | | The chip box is too small for smooth chip evacuation. | Enlarge the chip box. |
| | | Cutting condition | The feed (*f*) is not suitable. | Use an appropriate feed. |
| | | | The coolant pressure is not high enough. | Increase the coolant pressure. |
| | | Workpiece | Interrupted or cross drilling is required. | Change the tool to a standard gundrill. |
| | | | The operation is for stacked plates. | Change the cutting edge shape so that the cores become small. |
| | | | The material quality varies. | Increase the feed. |
| | Chip entanglement | Drill | The cutting edge is fractured or chipped. | See "Breakage" for the details. |
| | | | Wear on the outer corner is excessive. | Regrind the gundrill (ease the tool life criteria). |
| | | Cutting condition | The feed (*f*) is too low. | Increase the feed. |
| | | Workpiece | Drilling a center hole is required. | Make the center hole as small as the drill diameter and increase the coolant pressure. |

## Drilling Tools

### Nomenclature for gun reamer




### Troubleshooting in gun reaming

| Trouble | | Possible cause | | Countermeasure |
|---|---|---|---|---|
| Breaking of reamer | | Increased burnishing torque due to excessively small stock allowance | ● Chamfer angle small | ● Enlarge chamfer angle and increase stock allowance |
| | | | ● Excessive wear in peripheral cutting edge. | ● Reduce cutting speed to prevent peripheral wear of edge<br>● Increase lubricity of cutting fluid |
| | | Sticking | ● Faulty filtering of cutting fluid<br>● Incorrect selection of cutting fluid<br>● Insufficient cutting fluid pressure | ● Improve filtering accuracy<br>● Change to fluid with higher lubricity<br>● Increase fluid pressure |
| | | Mechanical trouble | | ● Repair electrical system<br>● Improve clamping method of workpiece |
| Faulty machining accuracy | Unacceptable surface roughness<br><br>Too large and inconsistent over size | Excessive feed rate per tooth | | ● Reduce fluid pressure<br>● Increase number of teeth |
| | | Improper tool specifications | ● Excessive chamfer angle<br>● Excessive back taper<br>● Peripheral run out excessive | ● Reduce chamfer angle<br>● Reduce back taper<br>● Improve run out accuracy |
| | | Faulty regrinding | ● Cutting edge run out is large<br>● Residual damage of preceding process | ● Improve run out accuracy<br>● Remove residual damage completely |
| | | Improper cutting fluid | ● Excessive fluid pressure<br>● Improper selection of cutting fluid | ● Reduce fluid pressure<br>● Increase activity and lubricity of the fluid |
| | | Faulty machine accuracy | | ● Correct spindle run out and bushing clearance and alignment |
| | | Faulty clamping of workpiece | ● Clamping position wrong<br>● Clamping force inadequate | ● Improper clamping position<br>● Increase clamping force |
| | Defective out-of-roundness | Faulty machine accuracy | ● Excessive bushing clearance<br>● Faulty spindle run out and alignment | ● Correct bushing clearance<br>● Correct spindle run out and alignment |
| | | Improper tool specifications | ● Outer run out of reamer large<br>● Insufficient reamer rigidity | ● Correct peripheral run out<br>● Increase reamer rigidity |
| | | Faulty clamping position of workpiece | | ● Change clamping position |
| | | Unevenness in wall thickness of workpiece | | ● Reduce reamer guide width (margin width) |
| | Insufficient oversize allowance | Chamfer angle small | | ● Increase chamfer angle |
| | | Excessive wear in peripheral cutting edge | ● Too high cutting speed<br>● Faulty lubricity of cutting fluid | ● Decrease cutting speed<br>● Increase lubricating capacity |
| | | Faulty regrinding (residual damage) | | ● Increase regrinding stock amount |

## International Tolerance (IT Grade)

### International Tolerance (IT Grade)

IT grades shows a tolerance allowable for difference of the diameters of a hole and a shaft. As the number added after IT increases, the tolerance becomes rough. Depending on the basic size, the tolerance value in each grade varies.
In the catalog, IT grades are shown as a guide of dimensional dispersion in the diameters of holes machined with the drill. For information, H8 tolerance for a ø8.0 hole is 0 to + 0.022 mm, the width of the value is the same as that of IT 8.
In the Table shown below, tolerance areas attainable with typical drilling tools are distinguished by using different colours. Solid drills are generally used for machining holes of IT 9 to 12. For machining a hole of better than IT 8, finishing process such as reaming is required. For a hole better than IT 5, high-precision finishing is required. Above description is based on machining of general steel. In practice, the IT grade attained with the tool varies widely depending on the hardness and the composition of the work material.

### ● IT (International Tolerance) Grades

| Basic size (mm) | | International tolerance grade | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | IT1 | IT2 | IT3 | IT4 | IT5 | IT6 | IT7 | IT8 | IT9 | IT10 | IT11 | IT12 | IT13 | IT14 | IT15 | IT16 | IT17 | IT18 |
| > | ≤ | | | | | | (μm) | | | | | | | | | (mm) | | | |
| - | 3 | 0.8 | 1.2 | 2 | 3 | 4 | 6 | 10 | 14 | 25 | 40 | 60 | 0.1 | 0.14 | 0.25 | 0.4 | 0.6 | 1 | 1.4 |
| 3 | 6 | 1 | 1.5 | 2.5 | 4 | 5 | 8 | 12 | 18 | 30 | 48 | 75 | 0.12 | 0.18 | 0.3 | 0.48 | 0.75 | 1.2 | 1.8 |
| 6 | 10 | 1 | 1.5 | 2.5 | 4 | 6 | 9 | 15 | 22 | 36 | 58 | 90 | 0.15 | 0.22 | 0.36 | 0.58 | 0.9 | 1.5 | 2.2 |
| 10 | 18 | 1.2 | 2 | 3 | 5 | 8 | 11 | 18 | 27 | 43 | 70 | 110 | 0.18 | 0.27 | 0.43 | 0.7 | 1.1 | 1.8 | 2.7 |
| 18 | 30 | 1.5 | 2.5 | 4 | 6 | 9 | 13 | 21 | 33 | 52 | 84 | 130 | 0.21 | 0.33 | 0.52 | 0.84 | 1.3 | 2.1 | 3.3 |
| 30 | 50 | 1.5 | 2.5 | 4 | 7 | 11 | 16 | 25 | 39 | 62 | 100 | 160 | 0.25 | 0.39 | 0.62 | 1 | 1.6 | 2.5 | 3.9 |
| 50 | 80 | 2 | 3 | 5 | 8 | 13 | 19 | 30 | 46 | 74 | 120 | 190 | 0.3 | 0.46 | 0.74 | 1.2 | 1.9 | 3 | 4.6 |
| 80 | 120 | 2.5 | 4 | 6 | 10 | 15 | 22 | 35 | 54 | 87 | 140 | 220 | 0.35 | 0.54 | 0.87 | 1.4 | 2.2 | 3.5 | 5.4 |
| 120 | 180 | 3.5 | 5 | 8 | 12 | 18 | 25 | 40 | 63 | 100 | 160 | 250 | 0.4 | 0.63 | 1 | 1.6 | 2.5 | 4 | 6.3 |
| 180 | 250 | 4.5 | 7 | 10 | 14 | 20 | 29 | 46 | 72 | 115 | 185 | 290 | 0.46 | 0.72 | 1.15 | 1.85 | 2.9 | 4.6 | 7.2 |
| 250 | 315 | 6 | 8 | 12 | 16 | 23 | 32 | 52 | 81 | 130 | 210 | 320 | 0.52 | 0.81 | 1.3 | 2.1 | 3.2 | 5.2 | 8.1 |
| 315 | 400 | 7 | 9 | 13 | 18 | 25 | 36 | 57 | 89 | 140 | 230 | 360 | 0.57 | 0.89 | 1.4 | 2.3 | 3.6 | 5.7 | 8.9 |
| 400 | 500 | 8 | 10 | 15 | 20 | 27 | 40 | 63 | 97 | 155 | 250 | 400 | 0.63 | 0.97 | 1.55 | 2.5 | 4 | 6.3 | 9.7 |
| 500 | 630 | 9 | 11 | 16 | 22 | 32 | 44 | 70 | 110 | 175 | 280 | 440 | 0.7 | 1.1 | 1.75 | 2.8 | 4.4 | 7 | 11 |
| 630 | 800 | 10 | 13 | 18 | 25 | 36 | 50 | 80 | 125 | 200 | 320 | 500 | 0.8 | 1.25 | 2 | 3.2 | 5 | 8 | 12.5 |
| 800 | 1000 | 11 | 15 | 21 | 28 | 40 | 56 | 90 | 140 | 230 | 360 | 560 | 0.9 | 1.4 | 2.3 | 3.6 | 5.6 | 9 | 14 |
| 1000 | 1250 | 13 | 18 | 24 | 33 | 47 | 66 | 105 | 165 | 260 | 420 | 660 | 1.05 | 1.65 | 2.6 | 4.2 | 6.6 | 10.5 | 16.5 |
| 1250 | 1600 | 15 | 21 | 29 | 39 | 55 | 73 | 125 | 195 | 310 | 500 | 780 | 1.25 | 1.95 | 3.1 | 5 | 7.8 | 12.5 | 19.5 |
| 1600 | 2000 | 18 | 25 | 35 | 46 | 65 | 92 | 150 | 230 | 370 | 600 | 920 | 1.5 | 2.3 | 3.7 | 6 | 9.2 | 15 | 23 |
| 2000 | 2500 | 22 | 30 | 41 | 55 | 78 | 110 | 175 | 280 | 440 | 700 | 1100 | 1.75 | 2.8 | 4.4 | 7 | 11 | 17.5 | 28 |
| 2500 | 3150 | 26 | 36 | 50 | 68 | 96 | 135 | 210 | 330 | 540 | 860 | 1350 | 2.1 | 3.3 | 5.4 | 8.6 | 13.5 | 21 | 33 |

Tolerance area requiring finishing process such as with a reamer.

Tolerance area attainable with a solid drill.

Tolerance area attainable with an indexable drill.

## Deviations of Shafts to be Used in Commonly Used Fits

### Deviations of Shafts to be Used in Commonly Used Fits (JIS B0401 extrac)

| Basic size step (mm) | | Tolerance zone class of shaft (μm) | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| > | ≤ | e9 | f6 | f7 | f8 | g5 | g6 | h5 | h6 | h7 | h8 | h9 | js5 | js6 | js7 | k5 | k6 |
| – | 3 | −14<br>−39 | −6<br>−12 | −6<br>−16 | −6<br>−20 | −2<br>−6 | −2<br>−8 | 0<br>−4 | 0<br>−6 | 0<br>−10 | 0<br>−14 | 0<br>−25 | ±2 | ±3 | ±5 | +4<br>0 | +6<br>0 |
| 3 | 6 | −20<br>−50 | −10<br>−18 | −10<br>−22 | −10<br>−28 | −4<br>−9 | −4<br>−12 | 0<br>−5 | 0<br>−8 | 0<br>−12 | 0<br>−18 | 0<br>−30 | ±2.5 | ±4 | ±6 | +6<br>+1 | +9<br>+1 |
| 6 | 10 | −25<br>−61 | −13<br>−22 | −13<br>−28 | −13<br>−35 | −5<br>−11 | −5<br>−14 | 0<br>−6 | 0<br>−9 | 0<br>−15 | 0<br>−22 | 0<br>−36 | ±3 | ±4.5 | ±7 | +7<br>+1 | +10<br>+1 |
| 10 | 14 | −32<br>−75 | −16<br>−27 | −16<br>−34 | −16<br>−43 | −6<br>−14 | −6<br>−17 | 0<br>−8 | 0<br>−11 | 0<br>−18 | 0<br>−27 | 0<br>−43 | ±4 | ±5.5 | ±9 | +9<br>+1 | +12<br>+1 |
| 14 | 18 | | | | | | | | | | | | | | | | |
| 18 | 24 | −40<br>−92 | −20<br>−33 | −20<br>−41 | −20<br>−53 | −7<br>−16 | −7<br>−20 | 0<br>−9 | 0<br>−13 | 0<br>−21 | 0<br>−33 | 0<br>−52 | ±4.5 | ±6.5 | ±10 | +11<br>+2 | +15<br>+2 |
| 24 | 30 | | | | | | | | | | | | | | | | |
| 30 | 40 | −50<br>−112 | −25<br>−41 | −25<br>−50 | −25<br>−64 | −9<br>−20 | −9<br>−25 | 0<br>−11 | 0<br>−16 | 0<br>−25 | 0<br>−39 | 0<br>−62 | ±5.5 | ±8 | ±12 | +13<br>+2 | +18<br>+2 |
| 40 | 50 | | | | | | | | | | | | | | | | |
| 50 | 65 | −60<br>−134 | −30<br>−49 | −30<br>−60 | −30<br>−76 | −10<br>−23 | −10<br>−29 | 0<br>−13 | 0<br>−19 | 0<br>−30 | 0<br>−46 | 0<br>−74 | ±6.5 | ±9.5 | ±15 | +15<br>+2 | +21<br>+2 |
| 65 | 80 | | | | | | | | | | | | | | | | |
| 80 | 100 | −72<br>−159 | −36<br>−58 | −36<br>−71 | −36<br>−90 | −12<br>−27 | −12<br>−34 | 0<br>−15 | 0<br>−22 | 0<br>−35 | 0<br>−54 | 0<br>−87 | ±7.5 | ±11 | ±17 | +18<br>+3 | +25<br>+3 |
| 100 | 120 | | | | | | | | | | | | | | | | |

In every step given in the table, the value on the upper side shows the upper deviation and the value on the lower side, the lower deviation.

### Deviations of Holes to be Used in Commonly Used Fits. (JIS B0401 extrac)

| Basic size step (mm) | | Tolerance zone class of hole (μm) | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| > | ≤ | E7 | E8 | E9 | F6 | F7 | F8 | G6 | G7 | H6 | H7 | H8 | H9 | H10 | JS6 | JS7 | K6 | K7 |
| – | 3 | +24<br>+14 | +28<br>+14 | +39<br>+14 | +12<br>+6 | +16<br>+6 | +20<br>+6 | +8<br>+2 | +12<br>+2 | +6<br>0 | +10<br>0 | +14<br>0 | +25<br>0 | +40<br>0 | ±3 | ±5 | 0<br>−6 | 0<br>−10 |
| 3 | 6 | +32<br>+20 | +38<br>+20 | +50<br>+20 | +18<br>+10 | +22<br>+10 | +28<br>+10 | +12<br>+4 | +16<br>+4 | +8<br>0 | +12<br>0 | +18<br>0 | +30<br>0 | +48<br>0 | ±4 | ±6 | +2<br>−6 | +3<br>−9 |
| 6 | 10 | +40<br>+25 | +47<br>+25 | +61<br>+25 | +22<br>+13 | +28<br>+13 | +35<br>+13 | +14<br>+5 | +20<br>+5 | +9<br>0 | +15<br>0 | +22<br>0 | +36<br>0 | +58<br>0 | ±4.5 | ±7 | +2<br>−7 | +5<br>−10 |
| 10 | 14 | +50<br>+32 | +59<br>+32 | +75<br>+32 | +27<br>+16 | +34<br>+16 | +43<br>+16 | +17<br>+6 | +24<br>+6 | +11<br>0 | +18<br>0 | +27<br>0 | +43<br>0 | +70<br>0 | ±5.5 | ±9 | +2<br>−9 | +6<br>−12 |
| 14 | 18 | | | | | | | | | | | | | | | | | |
| 18 | 24 | +61<br>+40 | +73<br>+40 | +92<br>+40 | +33<br>+20 | +41<br>+20 | +53<br>+20 | +20<br>+7 | +28<br>+7 | +13<br>0 | +21<br>0 | +33<br>0 | +52<br>0 | +84<br>0 | ±6.5 | ±10 | +2<br>−11 | +6<br>−15 |
| 24 | 30 | | | | | | | | | | | | | | | | | |
| 30 | 40 | +75<br>+50 | +89<br>+50 | +112<br>+50 | +41<br>+25 | +50<br>+25 | +64<br>+25 | +25<br>+9 | +34<br>+9 | +16<br>0 | +25<br>0 | +39<br>0 | +62<br>0 | +100<br>0 | ±8 | ±12 | +3<br>−13 | +7<br>−18 |
| 40 | 50 | | | | | | | | | | | | | | | | | |
| 50 | 65 | +90<br>+60 | +106<br>+60 | +134<br>+60 | +49<br>+30 | +60<br>+30 | +76<br>+30 | +29<br>+10 | +40<br>+10 | +19<br>0 | +30<br>0 | +46<br>0 | +74<br>0 | +120<br>0 | ±9.5 | ±15 | +4<br>−15 | +9<br>−21 |
| 65 | 80 | | | | | | | | | | | | | | | | | |
| 80 | 100 | +107<br>+72 | +126<br>+72 | +159<br>+72 | +58<br>+36 | +71<br>+36 | +90<br>+36 | +34<br>+12 | +47<br>+12 | +22<br>0 | +35<br>0 | +54<br>0 | +87<br>0 | +140<br>0 | ±11 | ±17 | +4<br>−18 | +10<br>−25 |
| 100 | 120 | | | | | | | | | | | | | | | | | |

In every step given in the table, the value on the upper side shows the upper deviation and the value on the lower side, the lower deviation.

## Symbols of Metals

● Carbon steel and alloy steel for structural use

| Type | Japan | International | Other countries | | | | |
|---|---|---|---|---|---|---|---|
| | | | U.S.A. | Great Britain | Germany | France | Russia |
| | JIS | ISO | AISI SAE | BS BS/EN | DIN DIN/EN | NF NF/EN | ГОСТ |
| Carbon steel | S10C | C10 | 1010 | C10<br>C10E<br>C10R | C10E<br>C10R | C10E<br>C10R | – |
| | S15C | C15E4<br>C15M2 | 1015 | C15<br>C15E<br>C15R | C15E<br>C15R | C15E<br>C15R | – |
| | S20C | – | 1020 | C22, C22E<br>C22R | C22<br>C22E<br>C22R | C22<br>C22E<br>C22R | – |
| | S25C | C25<br>C25E4<br>C25M2 | 1025 | C25<br>C25E<br>C25R | C25<br>C25E<br>C25R | C25<br>C25E<br>C25R | – |
| | S30C | C30<br>C30E4<br>C30M2 | 1030 | C30<br>C30E<br>C30R | C30<br>C30E<br>C30R | C30<br>C30E<br>C30R | 30Г |
| | S35C | C35<br>C35E4<br>C35M2 | 1035 | C35<br>C35E<br>C35R | C35<br>C35E<br>C35R | C35<br>C35E<br>C35R | 35Г |
| | S40C | C40<br>C40E4<br>C40M2 | 1039<br>1040 | C40<br>C40E<br>C40R | C40<br>C40E<br>C40R | C40<br>C40E<br>C40R | 40Г |
| | S43C | – | 1042<br>1043 | 080A42 | – | – | 40Г |
| | S45C | C45<br>C45E4<br>C45M2 | 1045<br>1046 | C45<br>C45E<br>C45R | C45<br>C45E<br>C45R | C45<br>C45E<br>C45R | 45Г |
| | S48C | – | – | – | – | – | 45Г |
| | S50C | C50<br>C50E4<br>C50M2 | 1049 | C50<br>C50E<br>C50R | C50<br>C50E<br>C50R | C50<br>C50E<br>C50R | 50Г |
| | S53C | – | 1050<br>1053 | – | – | – | 50Г |
| | S55C | C55<br>C55E4<br>C55M2 | 1055 | C55<br>C55E<br>C55R | C55<br>C55E<br>C55R | C55<br>C55E<br>C55R | – |
| | S58C | C60<br>C60E4<br>C60M2 | 1059<br>1060 | C60<br>C60E<br>C60R | C60<br>C60E<br>C60R | C60<br>C60E<br>C60R | 60Г |

| Type | | Japan | International | Other countries | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | U.S.A. | Great Britain | Germany | France | Russia |
| | | JIS | ISO | AISI SAE | BS BS/EN | DIN DIN/EN | NF NF/EN | ГОСТ |
| Alloy steel | Nickel chromium steel | SNC236 | – | – | – | – | – | 40XH |
| | | SNC415(H) | – | – | – | – | – | – |
| | | SNC631(H) | – | – | – | – | – | 30XH3A |
| | | SNC815(H) | 15NiCr13 | – | 15NiCr13 | 15NiCr13 | 15NiCr13 | – |
| | | SNC836 | – | – | – | – | – | – |
| | Nickel chromium molybdenum steel | SNCM220 | 20NiCrMo2<br>20NiCrMoS2 | 8615<br>8617(H)<br>8620(H)<br>8622(H) | 20NiCrMo2-2<br>20NiCrMoS2-2 | 20NiCrMo2-2<br>20NiCrMoS2-2 | 20NiCrMo2-2<br>20NiCrMoS2-2 | – |
| | | SNCM240 | 41CrNiMo2<br>41CrNiMoS2 | 8637<br>8640 | – | – | – | – |
| | | SNCM415 | – | – | – | – | – | – |
| | | SNCM420(H) | – | 4320(H) | – | – | – | 20XH2M(20XHM) |
| | | SNCM431 | – | – | – | – | – | – |
| | | SNCM439 | – | 4340 | – | – | – | – |
| | | SNCM447 | – | – | – | – | – | – |
| | | SNCM616 | – | – | – | – | – | – |
| | | SNCM625 | – | – | – | – | – | – |
| | | SNCM630 | – | – | – | – | – | – |
| | | SNCM815 | – | – | – | – | – | – |

Note: The above chart is based on published data and not authorized by each manufacturer.

## Symbols of Metals

### ● Alloy steel

| Type | | Japan | International | Other countries | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | U.S.A. | Great Britain | Germany | France | Russia |
| | | JIS | ISO | AISI SAE | BS BS/EN | DIN DIN/EN | NF NF/EN | ГОСТ |
| Alloy steel | Chromium steel | SCr415(H) | – | – | 17Cr3<br>17CrS3 | 17Cr3<br>17CrS3 | 17Cr3<br>17CrS3 | 15X<br>15XA |
| | | SCr420(H) | 20Cr4(H)<br>20CrS4 | 5120(H) | – | – | – | 20X |
| | | SCr430(H) | 34Cr4<br>34CrS4 | 5130(H)<br>5132(H) | 34Cr4<br>34CrS4 | 34Cr4<br>34CrS4 | 34Cr4<br>34CrS4 | 30X |
| | | SCr435(H) | 34Cr4<br>34CrS4<br>37Cr4<br>37CrS4 | 5132 | 37Cr4<br>37CrS4 | 37Cr4<br>37CrS4 | 37Cr4<br>37CrS4 | 35X |
| | | SCr440(H) | 37Cr4<br>37CrS4<br>41Cr4<br>41CrS4 | 5140(H) | 530M40<br>41Cr4<br>41CrS4 | 41Cr4<br>41CrS4 | 41Cr4<br>41CrS4 | 40X |
| | | SCr445(H) | – | – | – | – | – | 45X |
| | Chromium molybdenum steel | SCM415(H) | – | – | – | – | – | – |
| | | SCM418(H) | 18CrMo4<br>18CrMoS4 | – | 18CrMo4<br>18CrMoS4 | 18CrMo4<br>18CrMoS4 | 18CrMo4<br>18CrMoS4 | 20XM |
| | | SCM420(H) | – | – | 708M20(708H20) | – | – | 20XM |
| | | SCM430 | – | 4130 | – | – | – | 30XM<br>30XMA |
| | | SCM432 | – | – | – | – | – | – |
| | | SCM435(H) | 34CrMo4<br>34CrMoS4 | 4137(H) | 34CrMo4<br>34CrMoS4 | 34CrMo4<br>34CrMoS4 | 34CrMo4<br>34CrMoS4 | 35XM |
| | | SCM440(H) | 42CrMo4<br>42CrMoS4 | 4140(H)<br>4142(H) | 42CrMo4<br>42CrMoS4 | 42CrMo4<br>42CrMoS4 | 42CrMo4<br>42CrMoS4 | – |
| | | SCM445(H) | – | 4145(H)<br>4147(H) | – | – | – | – |
| | Manganese steel and manganese chromium steel | SMn420(H) | 22Mn6(H) | 1522(H) | | – | – | – |
| | | SMn433(H) | – | 1534 | – | – | – | 30Г2<br>35Г2 |
| | | SMn438(H) | 36Mn6(H) | 1541(H) | – | – | – | 35Г2<br>40Г2 |
| | | SMn443(H) | 42Mn6(H) | 1541(H) | – | – | – | 40Г2<br>45Г2 |
| | | SMnC420(H) | – | – | – | – | – | – |
| | | SMnC443(H) | – | – | – | – | – | – |
| | Aluminium chromium molybdenum steel | SACM645 | 41CrAlMo74 | – | – | – | – | – |

### ● Stainless steel

| Type | | Japan | International | Other countries | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | U.S.A. | | Great Britain | Germany | France | Russia |
| | | JIS | ISO | UNS | AISI SAE | BS BS/EN | DIN DIN/EN | NF NF/EN | ГОСТ |
| Stainless steel | Austenitic | SUS201 | X12CrMnNiN17-7-5 | S20100 | 201 | | | Z12CMN17-07Az | |
| | | SUS202 | X12CrMnNiN18-9-5 | S20200 | 202 | 284S16 | | | 12Х17Г9АН4 |
| | | SUS301 | X10CrNi18-8 | S30100 | 301 | 301S21 | X12CrNi17-7 | Z11CN17-08 | 07Х16Н6 |
| | | SUS301L | X2CrNiN18-7 | | | | X2CrNiN18-7 | | |
| | | SUS301J1 | | | | | X12CrNi17-7 | | |
| | | SUS302 | | S30200 | 302 | 302S25 | | Z12CN18-09 | 12Х18Н9 |
| | | SUS302B | X12CrNiSi18-9-3 | S30215 | 302B | | | | |
| | | SUS303 | X10CrNiS18-9 | S30300 | 303 | 303S21 | X10CrNiS18-9 | Z8CNF18-09 | |
| | | SUS303Se | | S30323 | 303Se | 303S41 | | | 12Х18Н10Е |
| | | SUS303Cu | | | | | | | |
| | | SUS304 | X5CrNi18-9 | S30400 | 304 | 304S31 | X5CrNi18-10 | Z7CN18-09 | 08Х18Н10 |
| | | SUS304L | X2CrNi18-9 | S30403 | 304L | 304S11 | X2CrNi19-11 | Z3CN19-11 | 03Х18Н11 |
| | | SUS304N1 | X5CrNiN18-8 | S30451 | 304N | | | Z6CN19-09Az | |
| | | SUS304N2 | | S30452 | | | | | |
| | | SUS304LN | X2CrNiN18-9 | S30453 | 304LN | | X2CrNiN18-10 | Z3CN18-10Az | |
| | | SUS304J1 | | | | | | | |
| | | SUS304J2 | | | | | | | |
| | | SUS304J3 | | S30431 | S30431 | | | | |
| | | SUS305 | X6CrNi18-12 | S30500 | 305 | 305S19 | X5CrNi18-12 | Z8CN18-12 | 06Х18Н11 |

Note: The above chart is based on published data and not authorized by each manufacturer.

## Symbols of Metals

● Stainless steel

| Type | | Japan | International | Other countries | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | U.S.A. | | Great Britain | Germany | France | Russia |
| | | JIS | ISO | UNS | AISI SAE | BS BS/EN | DIN DIN/EN | NF NF/EN | ГОСТ |
| Stainless steel | Austenitic | SUS305J1 | | | | | | | |
| | | SUS309S | | S30908 | 309S | | | Z10CN24-13 | |
| | | SUS310S | X6CrNi25-21 | S31008 | 310S | 310S31 | | Z8CN25-20 | 10X23H18 |
| | | SUS315J1 | | | | | | | |
| | | SUS315J2 | | | | | | | |
| | | SUS316 | X5CrNiMo17-12-2<br>X3CrNiMo17-12-3 | S31600 | 316 | 316S31 | X5CrNiMo17-12-2<br>X5CrNiMo17-13-3 | Z7CND17-12-02<br>Z6CND18-12-03 | |
| | | SUS316F | | | | | | | |
| | | SUS316L | X2CrNiMo17-12-2<br>X2CrNiMo17-12-3<br>X2CrNiMo18-14-3 | S31603 | 316L | 316S11 | X2CrNiMo17-13-2<br>X2CrNiMo17-14-3 | Z3CND17-12-02<br>Z3CND17-12-03 | 03X17H14M3 |
| | | SUS316N | | S31651 | 316N | | | | |
| | | SUS316LN | X2CrNiMoN17-11-2<br>X2CrNiMoN17-12-3 | S31653 | 316LN | | X2CrNiMoN17-12-2<br>X2CrNiMoN17-13-3 | Z3CND17-11Az<br>Z3CND17-12Az | |
| | | SUS316Ti | X6CrNiMoTi17-12-2 | S31635 | | | X6CrNiMoTi17-12-2 | Z6CNDT17-12 | 08X17H13M2T |
| | | SUS316J1 | | | | | | | |
| | | SUS316J1L | | | | | | | |
| | | SUS317 | | S31700 | 317 | 317S16 | | | |
| | | SUS317L | X2CrNiMo19-14-4 | S31703 | 317L | 317S12 | X2CrNiMo18-16-4 | Z3CND19-15-04 | |
| | | SUS317LN | X2CrNiMoN18-12-4 | S31753 | | | | Z3CND19-14Az | |
| | | SUS317J1 | | | | | | | |
| | | SUS317J2 | | | | | | | |
| | | SUS317J3L | | | | | | | |
| | | SUS836L | | N08367 | | | | | |
| | | SUS890L | X1CrNiMoCu25-20-5 | N08904 | N08904 | 904S14 | | Z2NCDU25-20 | |
| | | SUS321 | X6CrNiTi18-10 | S32100 | 321 | 321S31 | X6CrNiTi18-10 | Z6CNT18-10 | 08X18H10T |
| | | SUS347 | X6CrNiNb18-10 | S34700 | 347 | 347S31 | X6CrNiNb18-10 | Z6CNNb18-10 | 08X18H12Б |
| | | SUS384 | X3NiCr18-16 | S38400 | 384 | | | Z6CN18-16 | |
| | | SUSXM7 | X3CrNiCu18-9-4 | S30430 | 304Cu | 394S17 | | Z2CNU18-10 | |
| | | SUSXM15J1 | | S38100 | | | | Z15CNS20-12 | |
| | Austenitic Ferritic | SUS329J1 | | S32900 | 329 | | | | |
| | | SUS329J3L | X2CrNiMoN22-5-3 | S31803 | 31803 | | | Z3CNDU22-05Az | 08X21H6M2T |
| | | SUS329J4L | X2CrNiMoCuN25-6-3 | S32250 | 32250 | | | Z3CNDU25-07Az | |
| | Ferritic | SUS405 | X6CrAl13 | S40500 | 405 | 405S17 | X6CrAl13 | Z8CA12 | |
| | | SUS410L | | | | | | Z3C14 | |
| | | SUS429 | | S42900 | 429 | | | | |
| | | SUS430 | X6Cr17 | S43000 | 430 | 430S17 | X6Cr17 | Z8C17 | 12X17 |
| | | SUS430F | X7CrS17 | S43020 | 430F | | X7CrS18 | Z8CF17 | |
| | | SUS430LX | X3CrTi17<br>X3CrNb17 | S43035 | | | X6CrTi17 | Z4CT17 | |
| | | SUS430J1L | X2CrTi17 | | | | X6CrNb17 | Z4CNb17 | |
| | | SUS434 | X6CrMo17-1 | S43400 | 434 | 434S17 | X6CrMo17-1 | Z8CD17-01 | |
| | | SUS436L | X1CrMoTi16-1 | S43600 | 436 | | | | |
| | | SUS436J1L | | | | | | | |
| | | SUS444 | X2CrMoTi18-2 | S44400 | 444 | | | Z3CDT18-02 | |
| | | SUS445J1 | | | | | | | |
| | | SUS445J2 | | | | | | | |
| | | SUS447J1 | | S44700 | | | | | |
| | | SUSXM27 | | S44627 | | | | Z1CD26-01 | |
| | Martensitic | SUS403 | | S40300 | 403 | | | | |
| | | SUS410 | X12Cr13 | S41000 | 410 | 410S21 | X10Cr13 | Z13C13 | |
| | | SUS410S | X6Cr13 | S41008 | 410S | 403S17 | X6Cr13 | Z8C12 | 08X13 |
| | | SUS410F2 | | | | | | | |
| | | SUS410J1 | | S41025 | | | | | |
| | | SUS416 | X12CrS13 | S41600 | 416 | 416S21 | | Z11CF13 | |
| | | SUS420J1 | X20Cr13 | S42000 | 420 | 420S29 | X20Cr13 | Z20C13 | 20X13 |
| | | SUS420J2 | X30Cr13 | S42000 | 420 | 420S37 | X30Cr13 | Z33C13 | 30X13 |
| | | SUS420F | X29CrS13 | S42020 | 420F | | | Z30CF13 | |
| | | SUS420F2 | | | | | | | |
| | | SUS429J1 | | | | | | | |
| | | SUS431 | X19CrNi16-2 | S43100 | 431 | 431S29 | X20CrNi17-2 | Z15CN16-02 | 20X17H2 |
| | | SUS440A | X70CrMo15 | S44002 | 440A | | | Z70C15 | |
| | | SUS440B | | S44003 | 440B | | | | |
| | | SUS440C | X105CrMo17 | S44004 | 440C | | | Z100CD17 | 95X18 |
| | | SUS440F | | S44020 | S44020 | | | | |
| | Precipitation hardening type | SUS630 | X5CrNiCuNb16-4 | S17400 | S17400 | | | Z6CNU17-04 | |
| | | SUS631 | X7CrNiAl17-7 | S17700 | S17700 | | X7CrNiAl17-7 | Z9CNA17-07 | 09X17H7Ю |
| | | SUS631J1 | | | | | | | |

Note: The above chart is based on published data and not authorized by each manufacturer.

## Symbols of Metals

### ● Heat resistant steel

| Type | | Japan | International | Other countries | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | U.S.A. | | Great Britain | Germany | France | Russia |
| | | JIS | ISO | UNS | AISI SAE | BS BS/EN | DIN DIN/EN | NF NF/EN | ГОСТ |
| Heat resistant steel | Austenitic | SUH31 | | | | 331S42 | | Z35CNWS14-14 | 45X14H14B2M |
| | | SUH35 | | S63008 | | 349S52 | | Z52CMN21-09Az | |
| | | SUH36 | | | | 349S54 | X53CrMnNi21-9 | Z55CMN21-09Az | 55X20Г9 AH4 |
| | | SUH37 | | S63017 | | 381S34 | | | |
| | | SUH38 | | | | | | | |
| | | SUH309 | | S30900 | 309 | 309S24 | | Z15CN24-13 | |
| | | SUH310 | | S31000 | 310 | 310S24 | CrNi2520 | Z15CN25-20 | 20X25H20C2 |
| | | SUH330 | | N08330 | N08330 | | | Z12NCS35-16 | |
| | | SUH660 | | S66286 | | | | Z6NCTV25-20 | |
| | | SUH661 | | R30155 | | | | | |
| | Ferritic | SUH21 | | | | | CrAl1205 | | |
| | | SUH409 | X6CrTi12 | S40900 | 409 | 409S19 | X6CrTi12 | Z6CT12 | |
| | | SUH409L | X2CrTi12 | | | | | Z3CT12 | |
| | | SUH446 | | S44600 | 446 | | | Z12C25 | 15X28 |
| | Martensitic | SUH1 | | S65007 | | 401S45 | X45CrSi9-3 | Z45CS9 | |
| | | SUH3 | | | | | | Z40CSD10 | 40X10C2M |
| | | SUH4 | | | | 443S65 | | Z80CSN20-02 | |
| | | SUH11 | | | | | | | 40X9C2 |
| | | SUH600 | | | | | | | 20X12ВНМБФР |
| | | SUH616 | | S42200 | | | | | |

### ● Tool steel

| Type | Japan | International | U.S.A. |
|---|---|---|---|
| | JIS | ISO | AISI ASTM |
| Carbon tool steel | SK140 | – | – |
| | SK120 | C120U | W1-11 1/2 |
| | SK105 | C105U | W1-10 |
| | SK95 | – | W1-9 |
| | SK90 | C90U | – |
| | SK85 | – | W1-8 |
| | SK80 | C80U | – |
| | SK75 | – | – |
| | SK70 | C70U | – |
| | SK65 | – | – |
| | SK60 | – | – |
| High speed steel | SKH2 | HS18-0-1 | T1 |
| | SKH3 | – | T4 |
| | SKH4 | – | T5 |
| | SKH10 | – | T15 |
| | SKH40 | HS6-5-3-8 | – |
| | SKH50 | HS1-8-1 | – |
| | SKH51 | HS6-5-2 | M2 |
| | SKH52 | HS6-6-2 | M3-1 |
| | SKH53 | HS6-5-3 | M3-2 |
| | SKH54 | HS6-5-4 | M4 |
| | SKH55 | HS6-5-2-5 | – |
| | SKH56 | – | M36 |
| | SKH57 | HS10-4-3-10 | – |
| | SKH58 | HS2-9-2 | M7 |
| | SKH59 | HS2-9-1-8 | M42 |
| Alloy tool steel | SKS11 | – | F2 |
| | SKS2 | – | – |
| | SKS21 | – | – |

| Type | Japan | International | U.S.A. |
|---|---|---|---|
| | JIS | ISO | AISI ASTM |
| Alloy tool steel | SKS5 | – | – |
| | SKS51 | – | L6 |
| | SKS7 | – | – |
| | SKS81 | – | – |
| | SKS8 | – | – |
| | SKS4 | – | – |
| | SKS41 | – | – |
| | SKS43 | 105V | W2-9 1/2 |
| | SKS44 | – | W2-8 1/2 |
| | SKS3 | – | – |
| | SKS31 | – | – |
| | SKS93 | – | – |
| | SKS94 | – | – |
| | SKS95 | – | – |
| | SKD1 | X210Cr12 | D3 |
| | SKD2 | X210CrW12 | – |
| | SKD10 | X153CrMoV12 | – |
| | SKD11 | – | D2 |
| | SKD12 | X100CrMoV5 | A2 |
| | SKD4 | – | – |
| | SKD5 | X30WCrV9-3 | H21 |
| | SKD6 | – | H11 |
| | SKD61 | X40CrMoV5-1 | H13 |
| | SKD62 | X35CrWMoV5 | H12 |
| | SKD7 | 32CrMoV12-28 | H10 |
| | SKD8 | 38CrCoWV18-17-17 | H19 |
| | SKT3 | – | – |
| | SKT4 | 55NiCrMoV7 | – |
| | SKT6 | 45NiCrMo16 | – |

### ● Special use steel

| Type | Japan | International | U.S.A. |
|---|---|---|---|
| | JIS | ISO | AISI ASTM |
| Free cutting carbon steels | SUM11 | – | 1110 |
| | SUM12 | – | 1109 |
| | SUM21 | 9S20 | 1212 |
| | SUM22 | 11SMn28 | 1213 |
| | SUM22L | 11SMnPb28 | – |
| | SUM23 | – | 1215 |
| | SUM23L | – | – |
| | SUM24L | 11SMnPb28 | 12L14 |
| | SUM25 | 12SMn35 | – |
| | SUM31 | – | 1117 |
| | SUM31L | – | – |

| Type | Japan | International | U.S.A. |
|---|---|---|---|
| | JIS | ISO | AISI ASTM |
| Free cutting carbon steels | SUM32 | – | – |
| | SUM41 | – | 1137 |
| | SUM42 | – | 1141 |
| | SUM43 | 44SMn28 | 1144 |
| High carbon chromium | SUJ1 | – | – |
| | SUJ2 | B1 | 52100 |
| | SUJ3 | B2 | ASTM A 485 Grade 1 |
| | SUJ4 | – | – |
| | SUJ5 | – | – |

Note: The above chart is based on published data and not authorized by each manufacturer.

## Symbols of Metals

● Casting or forging steel

| Type | | Japan | International | Other countries | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | U.S.A. | Great Britain | Germany | France | Russia |
| | | JIS | ISO | AISI ASTM | BS BS/EN | DIN DIN/EN | NF NF/EN | ГОСТ |
| Casting steel | Carbon steel casting | SC | 200-400, 230-450, 270-480 | U- | A1, A2 | GS- | GE230, GE280, GE320 | – |
| | Steel casting for welded structure | SCW | 200-400W, 230-450W, 270-480W, 340-550W | WCA, WCB, WCC | A4 | – | GE230, GE280 | – |
| | Heat resisting steel casting | SCH | GX40CrSi24, GX40CrNiSi22-10, GX40NiCrSi38-19 | Grade HC, HD, HF | 309C30, 310C45, 330C12 | – | GX40NiCrNb45-35, GX50NiCrCoW35-25-15-5 | – |
| | Steel casting for high temperature and high pressure service | SCPH | – | Grade WC1, WC6, WC9 | A1, A2, B1, B2, B3, B4, B5, B7 | G20Mo5, G17CrMo5-5, G17CrMo5-10 | G17CrMo9-10, GX15CrMo5, GP240GH, GP280GH | – |
| | Steel casting for low temperature and high pressure service | SCPL | – | Grade LCB, LC1, LC2, LC3 | AL1, BL2 | – | FB-M, FC1-M, FC2-M,FC3-M | – |
| Casting iron | Grey iron casting | FC | 100,150,200,250, 300,350 | No.20,25,30,35, 40,45,50 | EN-GJL- | EN-GJL- | EN-GJL- | – |
| | Spheroidal graphite iron casting | FCD | 700-2, 600-3, 500-7, 450-10, 400-15, 400-18, 350-22 | 60-40-18, 65-45-12, 8-55-06, 100-70-03, 120-90-02 | EN-GJS- | EN-GJS- | EN-GJS- | ВЧ |
| | Austempered spheroidal graphite iron casting | FCAD | – | – | EN-GJS- | EN-GJS- | EN-GJS- | – |
| | Austenitic iron casting | FCA- FCDA- | L-, S- | Type 1, 2, Type D-2, D-3A Class 1, 2 | F1, F2, S2W, S5S | GGL-, GGG- | L-, S- | – |
| Forging steel | Carbon steel forging for general use | SF | – | Class A, B, C, D, E, F | C22, C25, C30, C35, C40, C45, C50, C55, C60 | P285, P355 | P245, P280, P305 | – |
| | Chromium molybdenum steel forgings for general use | SFCM | – | Class E, F, G, I Grade 3A, 4 Class G, J, K, L, M | – | – | – | – |
| | Nickel Chromium molybdenum steel forgings for general use | SFNCM | – | Class G, H, I, J Class 3A, 4, 5, 6 Class K, L, M | – | – | – | – |

● Non-ferrous alloy

| Type | | Japan | International | Other countries | | | |
|---|---|---|---|---|---|---|---|
| | | | | U.S.A. | | Great Britain | Germany |
| | | JIS | ISO | ASTM SAE | | BS BS/EN | DIN DIN/EN |
| Copper alloy, Nickel alloy | Copper alloy casting | CAC101 | – | – | – | – | |
| | | CAC102 | – | – | – | Cu-C(CC040AgrodeC) | |
| | | CAC103 | – | – | – | Cu-C(CC040AgrodeA,B) | |
| | Brass casting | CAC201 | – | – | – | CuZn15As-C(CC760S) | |
| | | CAC202 | – | C85400 | – | CuZn33Pb2-C(CC750S) | |
| | | CAC203 | – | C85700 | – | CuZn39Pb1-C(CC754S) | |
| | High strength brass casting | CAC301 | – | C86500 | – | CuZn35Mn2Al1Fe-C(CC765S) | |
| | | CAC302 | – | C86400 | – | CuZn34Mn3Al2Fe1-C(CC764S) | |
| | | CAC303 | – | C86200 | – | CuZn25Al5Mn4Fe3-C(CC762S) | |
| | | CAC304 | – | C86300 | – | CuZn25Al5Mn4Fe3-C(CC762S) | |
| | Bronze casting | CAC401 | – | C84400 | – | CuSn3Zn8Pb5-C(CC490K) | |
| | | CAC402 | – | C90300 | – | – | |
| | | CAC403 | – | C90500 | – | – | |
| | | CAC406 | – | C83600 | – | CuSn5Zn5Pb5-C(CC490K) | |
| | | CAC407 | – | C92200 | – | – | |
| | Phosphor bronze casting | CAC502A | – | C90700 C90800 | – | CuSn10-C(CC480K) CuSn12-C(CC483K) | |
| | | CAC502B | – | | – | | |
| | | CAC503A | – | | – | | |
| | | CAC503B | – | | – | | |
| | Aluminium bronze casting | CAC701 | – | C95200 | – | CuAl10Fe2-C(CC331G) | |
| | | CAC702 | – | C95400 | – | CuAl10Ni3Fe2-C(CC332G) | |
| | | | – | C95410 | – | | |
| | | CAC703 | – | C95800 | – | CuAl10Fe5Ni5-C(CC333G) | |
| | | CAC704 | – | C95700 | – | – | |
| | Silicon bronze castings | CAC801 | – | – | – | – | |
| | | CAC802 | – | C87500 | – | – | |
| | | CAC803 | – | C87400 | – | CuZn16Si4-C(CC761S) | |

Note: The above chart is based on published data and not authorized by each manufacturer.

## Symbols of Metals

● Non-ferrous alloy

| Type | | Japan | International | Other countries | | | |
|---|---|---|---|---|---|---|---|
| | | | | U.S.A. | Great Britain | Germany | France |
| | | JIS | ISO | ASTM SAE | BS BS/EN | DIN DIN/EN | NF NF/EN |
| Aluminium alloy | Aluminium alloy ingots for casting | AC1B | Al-Cu4MgTi | 204.0 | EN AC-2100 | | |
| | | AC2A | – | – | – | | |
| | | AC2B | – | 319.0 | – | | |
| | | AC3A | – | – | EN AC-44100 | | |
| | | AC4A | – | – | – | | |
| | | AC4B | Al-Si8Cu3 | 333.0 | EN AC-46200 | | |
| | | AC4C | Al-Si7Mg(Fe) | 356.0 | EN AC-42000 | | |
| | | AC4CH | Al-Si7Mg0.3 | A356.0 | EN AC-42100 | | |
| | | AC4D | – | 355.0 | EN AC-45300 | | |
| | | AC5A | Al-Cu4Ni2Mg2 | 242.0 | – | | |
| | | AC7A | – | 514.0 | – | | |
| | | AC8A | Al-Si12CuNiMg | – | EN AC-48000 | | |
| | | AC8B | – | – | – | | |
| | | AC8C | – | 332.0 | – | | |
| | | AC9A | – | – | – | | |
| | | AC9B | – | – | – | | |
| | Aluminium alloy die casting | ADC1 | – | A413.0 | – | | |
| | | ADC3 | – | A360.0 | – | | |
| | | ADC5 | – | 518.0 | – | | |
| | | ADC6 | – | – | – | | |
| | | ADC10 | – | – | – | | |
| | | ADC10Z | – | A380.0 | – | | |
| | | ADC12 | – | – | – | | |
| | | ADC12Z | – | 383.0 | – | | |
| | | ADC14 | – | B390.0 | – | | |
| Magnesium alloy | Magnesium alloy casting | MC5 | – | AM100A | – | | |
| | | MC6 | – | ZK51A | – | | |
| | | MC7 | – | ZK61A | – | | |
| | | MC8 | MgRE3Zn2Zr | EZ33A | EN MC65120 | | |
| | | MC9 | MgAg3RE2Zr | QE22A | EN MC65210 | | |
| | | MC10 | MgZn4RE1Zr | ZE41A | EN MC35110 | | |
| | Magnesium alloy die casting | MD1A | – | AZ91A | G-A9Z1Y4 | | |
| | | MDC1B | – | AZ91B | – | | |
| | | MDC1D | MgAl9Zn1(A) | AZ91D | EN MC21120 | | |
| | | MDC2B | MgAl6Mn | AM60B | EN MC21320 | | |

| Type | | Japan | International | Other countries | | | |
|---|---|---|---|---|---|---|---|
| | | | | U.S.A. | Great Britain | Germany | France |
| | | JIS | ISO | ASTM AA | BS BS/EN | DIN DIN/EN | NF NF/EN |
| Aluminium alloy | Aluminium alloy extruded shapes | A5052S | – | 5052 | EN AW-5052 | | |
| | | A5454S | – | 5454 | EN AW-5454 | | |
| | | A5083S | AlMg4.5Mn0.7 | 5083 | EN AW-5083 | | |
| | | A5086S | – | 5086 | EN AW-5086 | | |
| | | A6061S | AlMg1SiCu | 6061 | EN AW-6061 | | |
| | | A6063S | AlMg0.7Si | 6063 | EN AW-6063 | | |
| | | A7003S | – | – | EN AW-7003 | | |
| | | A7N01S | – | – | – | | |
| | | A7075S | AlZn5.5MgCu | 7075 | EN AW-7075 | | |

Note: The above chart is based on published data and not authorized by each manufacturer.

## Approximate Conversion Table of Hardness

### ● Approximate conversion value for Brinell hardness. *1

(The source: JIS HB Ferrous Materials and Metallurgy I -2005)

| HB | | HV | Rockwell *3 | | | | HS | Approx. tensile strength (MPa) *2 |
|---|---|---|---|---|---|---|---|---|
| Brinell, 10mm ball, Load 3000kg | | Vickers | HRA | HRB | HRC | HRD | Shore | |
| Standard ball | Tungsten carbide ball | | A Scale, Load 60kg, Brale Diamond | B Scale, Load 100kg, Diameter 1/16 in. Steel ball | C Scale, Load 150kg, brale diamond | D Scale, Load 100kg, Brale Diamond | | |
| – | – | 940 | 85.6 | – | 68.0 | 76.9 | 97 | – |
| – | – | 920 | 85.3 | – | 67.5 | 76.5 | 96 | – |
| – | – | 900 | 85.0 | – | 67.0 | 76.1 | 95 | – |
| – | (767) | 880 | 84.7 | – | 66.4 | 75.7 | 93 | – |
| – | (757) | 860 | 84.4 | – | 65.9 | 75.3 | 92 | – |
| – | (745) | 840 | 84.1 | – | 65.3 | 74.8 | 91 | – |
| – | (733) | 820 | 83.8 | – | 64.7 | 74.3 | 90 | – |
| – | (722) | 800 | 83.4 | – | 64.0 | 73.8 | 88 | – |
| – | (712) | – | – | – | – | – | – | – |
| – | (710) | 780 | 83.0 | – | 63.3 | 73.3 | 87 | – |
| – | (698) | 760 | 82.6 | – | 62.5 | 72.6 | 86 | – |
| – | (684) | 740 | 82.2 | – | 61.8 | 72.1 | – | – |
| – | (682) | 737 | 82.2 | – | 61.7 | 72.0 | 84 | – |
| – | (670) | 720 | 81.8 | – | 61.0 | 71.5 | 83 | – |
| – | (656) | 700 | 81.3 | – | 60.1 | 70.8 | – | – |
| – | (653) | 697 | 81.2 | – | 60.0 | 70.7 | 81 | – |
| – | (647) | 690 | 81.1 | – | 59.7 | 70.5 | – | – |
| – | (638) | 680 | 80.8 | – | 59.2 | 70.1 | 80 | – |
| – | 630 | 670 | 80.6 | – | 58.8 | 69.8 | – | – |
| – | 627 | 667 | 80.5 | – | 58.7 | 69.7 | 79 | – |
| – | – | 677 | 80.7 | – | 59.1 | 70.0 | – | – |
| – | 601 | 640 | 79.8 | – | 57.3 | 68.7 | 77 | – |
| – | – | 640 | 79.8 | – | 57.3 | 68.7 | – | – |
| – | 578 | 615 | 79.1 | – | 56.0 | 67.7 | 75 | – |
| – | – | 607 | 78.8 | – | 55.6 | 67.4 | – | – |
| – | 555 | 591 | 78.4 | – | 54.7 | 66.7 | 73 | 2055 |
| – | – | 579 | 78.0 | – | 54.0 | 66.1 | – | 2015 |
| – | 534 | 569 | 77.8 | – | 53.5 | 65.8 | 71 | 1985 |
| – | – | 553 | 77.1 | – | 52.5 | 65.0 | – | 1915 |
| – | 514 | 547 | 76.9 | – | 52.1 | 64.7 | 70 | 1890 |
| (495) | – | 539 | 76.7 | – | 51.6 | 64.3 | – | 1855 |
| – | – | 530 | 76.4 | – | 51.1 | 63.9 | – | 1825 |
| – | 495 | 528 | 76.3 | – | 51.0 | 63.8 | 68 | 1820 |
| (477) | – | 516 | 75.9 | – | 50.3 | 63.2 | – | 1780 |
| – | – | 508 | 75.6 | – | 49.6 | 62.7 | – | 1740 |
| – | 477 | 508 | 75.6 | – | 49.6 | 62.7 | 66 | 1740 |
| (461) | – | 495 | 75.1 | – | 48.8 | 61.9 | – | 1680 |
| – | – | 491 | 74.9 | – | 48.5 | 61.7 | – | 1670 |
| – | 461 | 491 | 74.9 | – | 48.5 | 61.7 | 65 | 1670 |
| 444 | – | 474 | 74.3 | – | 47.2 | 61.0 | – | 1595 |
| – | – | 472 | 74.2 | – | 47.1 | 60.8 | – | 1585 |
| – | 444 | 472 | 74.2 | – | 47.1 | 60.8 | 63 | 1585 |

| HB | | HV | Rockwell *3 | | | | HS | Approx. tensile strength (MPa) *2 |
|---|---|---|---|---|---|---|---|---|
| Brinell, 10mm ball, Load 3000kg | | Vickers | HRA | HRB | HRC | HRD | Shore | |
| Standard ball | Tungsten carbide ball | | A Scale, Load 60kg, Brale Diamond | B Scale, Load 100kg, Diameter 1/16 in. Steel ball | C Scale, Load 150kg, brale diamond | D Scale, Load 100kg, Brale Diamond | | |
| 429 | 429 | 455 | 73.4 | – | 45.7 | 59.7 | 61 | 1510 |
| 415 | 415 | 440 | 72.8 | – | 44.5 | 58.8 | 59 | 1460 |
| 401 | 401 | 425 | 72.0 | – | 43.1 | 57.8 | 58 | 1390 |
| 388 | 388 | 410 | 71.4 | – | 41.8 | 56.8 | 56 | 1330 |
| 375 | 375 | 396 | 70.6 | – | 40.4 | 55.7 | 54 | 1270 |
| 363 | 363 | 383 | 70.0 | – | 39.1 | 54.6 | 52 | 1220 |
| 352 | 352 | 372 | 69.3 | (110.0) | 37.9 | 53.8 | 51 | 1180 |
| 341 | 341 | 360 | 68.7 | (109.0) | 36.6 | 52.8 | 50 | 1130 |
| 331 | 331 | 350 | 68.1 | (108.5) | 35.5 | 51.9 | 48 | 1095 |
| 321 | 321 | 339 | 67.5 | (108.0) | 34.3 | 51.0 | 47 | 1060 |
| 311 | 311 | 328 | 66.9 | (107.5) | 33.1 | 50.0 | 46 | 1025 |
| 302 | 302 | 319 | 66.3 | (107.0) | 32.1 | 49.3 | 45 | 1005 |
| 293 | 293 | 309 | 65.7 | (106.0) | 30.9 | 48.3 | 43 | 970 |
| 285 | 285 | 301 | 65.3 | (105.5) | 29.9 | 47.6 | – | 950 |
| 277 | 277 | 292 | 64.6 | (104.5) | 28.8 | 46.7 | 41 | 925 |
| 269 | 269 | 284 | 64.1 | (104.0) | 27.6 | 45.9 | 40 | 895 |
| 262 | 262 | 276 | 63.6 | (103.0) | 26.6 | 45.0 | 39 | 875 |
| 255 | 255 | 269 | 63.0 | (102.0) | 25.4 | 44.2 | 38 | 850 |
| 248 | 248 | 261 | 62.5 | (101.0) | 24.2 | 43.2 | 37 | 825 |
| 241 | 241 | 253 | 61.8 | 100.0 | 22.8 | 42.0 | 36 | 800 |
| 235 | 235 | 247 | 61.4 | 99.0 | 21.7 | 41.4 | 35 | 785 |
| 229 | 229 | 241 | 60.8 | 98.2 | 20.5 | 40.5 | 34 | 765 |
| 223 | 223 | 234 | – | 97.3 | (18.8) | – | – | – |
| 217 | 217 | 228 | – | 96.4 | (17.5) | – | 33 | 725 |
| 212 | 212 | 222 | – | 95.5 | (16.0) | – | – | 705 |
| 207 | 207 | 218 | – | 94.6 | (15.2) | – | 32 | 690 |
| 201 | 201 | 212 | – | 93.8 | (13.8) | – | 31 | 675 |
| 197 | 197 | 207 | – | 92.8 | (12.7) | – | 30 | 655 |
| 192 | 192 | 202 | – | 91.9 | (11.5) | – | 29 | 640 |
| 187 | 187 | 196 | – | 90.7 | (10.0) | – | – | 620 |
| 183 | 183 | 192 | – | 90.0 | (9.0) | – | 28 | 615 |
| 179 | 179 | 188 | – | 89.0 | (8.0) | – | 27 | 600 |
| 174 | 174 | 182 | – | 87.8 | (6.4) | – | – | 585 |
| 170 | 170 | 178 | – | 86.8 | (5.4) | – | 26 | 570 |
| 167 | 167 | 175 | – | 86.0 | (4.4) | – | – | 560 |
| 163 | 163 | 171 | – | 85.0 | (3.3) | – | 25 | 545 |
| 156 | 156 | 163 | – | 82.9 | (0.9) | – | – | 525 |
| 149 | 149 | 156 | – | 80.8 | – | – | 23 | 505 |
| 143 | 143 | 150 | – | 78.7 | – | – | 22 | 490 |
| 137 | 137 | 143 | – | 76.4 | – | – | 21 | 460 |
| 131 | 131 | 137 | – | 74.0 | – | – | – | 450 |
| 126 | 126 | 132 | – | 72.0 | – | – | 20 | 435 |
| 121 | 121 | 127 | – | 69.8 | – | – | 19 | 415 |
| 116 | 116 | 122 | – | 67.6 | – | – | 18 | 400 |
| 111 | 111 | 117 | – | 65.7 | – | – | 15 | 385 |

Note :

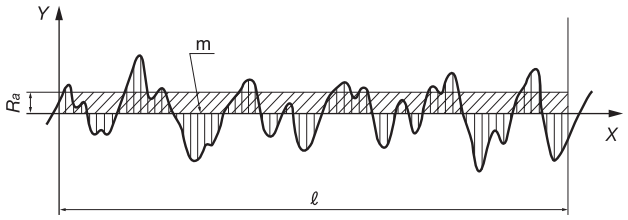
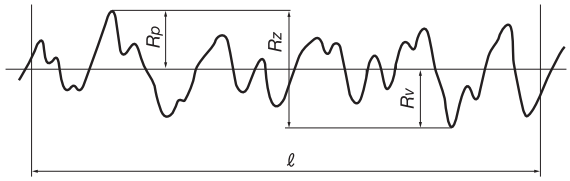
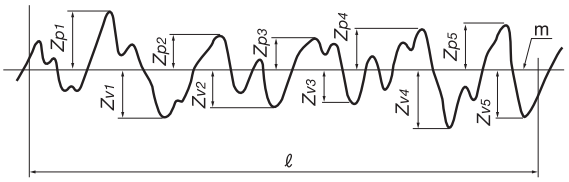
*1: This table is based on AMS Metals Handbook, the 8th Edition, Volume 1, and includes some information added to "Approx. tensile strength (MPa)," such as the values calculated in metric; and Brinell hardness that exceeds recommended values.

*2: 1 MPa = 1 N/mm$^2$

*3: Figures in ( ) are not commonly used. It's just reference.

## Surface Roughness

(According to JIS B 0601, 2001 and its explanation.)

| Type | Symbol | How to determine | Example (Fig.) |
|---|---|---|---|
| Arithmetic mean roughness | ***Ra*** | *Ra* means the value obtained by the following formula and expressed in micrometer (μm) when sampling only the reference length from the roughness curve in the direction of mean line, taking X-axis in the direction of mean line and Y-axis in the direction of longitudinal magnification of this sampled part and the roughness curve is expressed by *y- f (x)*:<br>$Ra = \frac{1}{\ell}\int_0^{\ell} \lvert f(x) \rvert dx$<br>where, $\ell$ : reference length |  |
| Maximum height | ***Rz*** | *Rz* shall be that only the reference length is sampled from the roughness curve in the direction of mean line, the distance between the top of profile peak line and the bottom of profile valley line on this sampled portion is measured in the longitudinal magnification direction of roughness curve and the obtained value is expressed in micrometer (μm).<br>$Rz = Rp + Rv$ |  |
| Ten point mean roughness | ***RzJIS*** | *RzJIS* shall be that only the reference length is sampled from the roughness curve in the direction of its mean line, the sum of the average value of absolute values of the heights of five highest profile peaks (*Zp*) and the depths of five deepest profile valleys (*Zv*) measured in the vertical magnification direction from the mean line of this sampled portion and this sum is expressed in micrometer (μm)<br>$RzJIS = \frac{\lvert Zp1+Zp2+Zp3+Zp4+Zp5 \rvert + \lvert Zv1+Zv2+Zv3+Zv4+Zv5 \rvert}{5}$ |  <br>where, $Zp_1, Zp_2, Zp_3, Zp_4, Zp_5$ : altitudes of the heights of five highest profile peaks of the sampled portion corresponding to the reference length $\ell$<br>where, $Zv_1, Zv_2, Zv_3, Zv_4, Zv_5$ : altitudes of the depths of five deepest profile valleys of the sampled portion corresponding to the reference length $\ell$ |

## Grade Comparison Chart

### ●CVD Coated Grades for Turning

| ISO | | Tungaloy | Mitsubishi Carbide | Sumitomo Electric | Sandvik | Kyocera | Mitsubishi Hitachi Tool | Dijet | NTK | Seco Tools | Kennametal | Iscar | TaeguTec | Widia | Walter | Ceratizit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Classification | Symbol | | | | | | | | | | | | | | | |
| P | P01 | **T9105** | UE6105 | AC810P | GC4205<br>GC4305 | CA5505<br>CA510 | HG8010 | JC110V | | TP0500<br>TP0501 | KC9105<br>KCP05 | IC8150<br>IC9150<br>IC9015 | TT8115 | TN10P<br>TN20K | WPP01<br>WPP05<br>WPP05S | |
| | P10 | **T9105**<br>**T9115** | UE6105<br>UE6110 | AC810P<br>AC820P | GC4205<br>GC4215<br>GC4305<br>GC4315 | CA5515<br>CA515 | HG8010<br>GM8020 | JC110V<br>JC215V | CP7<br>CP5 | TP0500<br>TP1500<br>TP0501<br>TP1501 | KC9110<br>KC9105<br>KCP10 | IC8150<br>IC9150<br>IC8080<br>IC9080<br>IC9015 | TT8115 | TN10P<br>TN20K<br>WP15CT | WPP05<br>WPP10<br>WAK20<br>WPP05S<br>WPP10S | CTC3110<br>CTCK120 |
| | P20 | **T9115**<br>**T9125** | UE6110<br>UE6020<br>MC6025 | AC820P<br>AC830P<br>AC8025P | GC4215<br>GC4315<br>GC4225<br>GC4325 | CA5515<br>CA515<br>CA5525<br>CA525 | HG8025<br>GM8020<br>GM25 | JC110V<br>JC215V | CP7<br>CP5 | TP1500<br>TP2500<br>TP1501<br>TP2501 | KC9215<br>KC9225<br>KC9325<br>KCP25 | IC8150<br>IC9150<br>IC9015<br>IC8250<br>IC9250 | TT8125<br>TT5100 | TN10P<br>TN15M<br>WP25CT | WPP20<br>WPP20S | CTCP115<br>CTCP125<br>CTC1425 |
| | P30 | **T9125**<br>**T9135**<br>**T6130** | MC6025<br>UE6035 | AC8025P<br>AC830P | GC4225<br>GC4235<br>GC4325 | CA5525<br>CA5535<br>CA530 | HG8025<br>GM8035<br>GM25 | JC215V<br>JC325V | | TP2500<br>TP3500<br>TP2501 | KC9140<br>KC9240<br>KCP30 | IC8080<br>IC656<br>IC9350 | TT8125<br>TT5100<br>TT8135 | TN30P<br>TN30M<br>WP35CT | WPP30<br>WAK30<br>WPP30S | CTCP125<br>CTC1425<br>CTC1135<br>CTC1435<br>CTC2135 |
| | P40 | **T9135**<br>**T6130** | UE6035<br>UH6400 | AC830P<br>AC630M | GC4235 | CA5535<br>CA530 | GM8035<br>GX30 | JC325V | | TP3500 | KC9140<br>KC9240<br>KCP40 | IC9350<br>IC635 | TT8135<br>TT7100 | TN30P<br>TN30M | WPP30<br>WAK30<br>WPP30S | CTC1135<br>CTC1435<br>CTC2135 |
| M | M10 | **T9115** | MC7015 | AC610M | GC2015 | CA6515 | | JC110V | | | KCM15 | IC9250<br>IC520M | TT9215 | TN15M<br>WM15CT | | CTCP115 |
| | M20 | **T6120**<br>**T9125** | MC7015<br>US7020<br>MC7025 | AC6030M | GC2015<br>GC2025 | CA6525 | HG8025<br>GM25 | JC110V | | TM2000 | KCM15<br>KCM25 | IC9025<br>IC9350<br>IC4050 | TT9215<br>TT9225 | TN15M<br>WM25CT | | CTC1425<br>CTCP125<br>CTC1135 |
| | M30 | **T6130** | MC7025<br>US735 | AC6030M<br>AC630M | GC2025<br>GC235 | | GM8035<br>GM25<br>GX30 | JC215V | | TM2000<br>TM4000 | KCM25<br>KCM35 | IC9350<br>IC4050<br>IC635 | TT9225<br>TT9235 | TN30M<br>WM35CT | | CTC1435<br>CTC2135 |
| | M40 | | US735 | | GC235 | | GX30 | | | TM4000 | KCM35<br>KCP40 | IC635 | TT9235 | | | |
| K | K01 | **T5105**<br>**T515** | MC5005<br>UC5105 | AC405K | GC3205 | CA4505 | HX3505 | JC050W<br>JC105V | CP1 | TK1001<br>TK1000 | KCK05 | IC8080 | | WK05CT | WAK10<br>WPP01 | |
| | K10 | **T5105**<br>**T5115** | MC5015<br>UC5115 | AC415K | GC3210 | CA4515 | HX3515<br>GM10<br>HG8010 | JC105V<br>JC110V | CP1 | TK1001<br>TK1000 | KCK05<br>KCK15 | IC9150<br>IC5100<br>IC4100 | TT7005 | WK05CT | WAK10<br>WPP10<br>WKK10S | CTC3110<br>CTC1425 |
| | K20 | **T515**<br>**T5115**<br>**T5125** | MC5015<br>UC5115 | AC420K | GC3215 | CA4515 | HX3515<br>GM8020 | JC110V<br>JC215V | CP1 | TK2000<br>TK2001 | KCK15<br>KCK20 | IC9150<br>IC5100<br>IC4100<br>IC9080 | TT7310 | WK20CT | WAK20<br>WPP20<br>WKK20S | CTC1435<br>CTCK120<br>CTCP115 |
| | K30 | **T5125**<br>**T9115** | | | | | HG8025 | JC215V | | | KCP25 | IC520M<br>IC4050 | | | WAK30<br>WKP30S | CTCP125 |

Note: The above table is selected from a publication. We have not obtained approval from each company.

## Grade Comparison Chart

### ●PVD Coated Grade for Turning

| ISO | | Tungaloy | Mitsubishi Carbide | Sumitomo Electric | Sandvik | Kyocera | Mitsubishi Hitachi Tool | Dijet | NTK | Seco Tools | Kennametal | Iscar | TaeguTec | Widia | Walter | Ceratizit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Classification | Symbol | | | | | | | | | | | | | | | |
| P | P01 | | | | | PR1005 | | | | | | | | | WXN10 | |
| | P10 | **AH710** | VP10RT | | GC1525 | PR930<br>PR1005<br>PR1115<br>PR1215<br>PR1425 | IP2000 | JC5003<br>JC5030 | VM1<br>DT4<br>DM4 | TS2000<br>CP200 | KC5010<br>KC5510<br>KCU10 | IC507<br>IC807<br>IC907 | | WS10PT | WSM10<br>WSM21 | |
| | P20 | **AH120<br>AH725<br>AH730<br>SH725<br>SH730<br>J740** | VP10RT<br>VP15TF<br>VP20MF<br>VP20RT<br>UP20M | AC520U | GC1525<br>GC1125 | PR930<br>PR1025<br>PR1115<br>PR1215<br>PR1425<br>PR1225 | IP2000<br>IP3000 | JC5030<br>JC5040 | VM1<br>DT4<br>DM4 | TS2500<br>CP200 | KC5025<br>KC5525<br>KCU25 | IC507<br>IC807<br>IC907 | TT9030 | WS10PT<br>WS25PT | WSM20<br>WSM21 | |
| | P30 | **AH120<br>AH725<br>SH725<br>AH730<br>SH730<br>GH730<br>GH330<br>J740** | VP15TF<br>VP20MF<br>VP20RT<br>UP20M | AC530U | GC1125 | PR1025<br>PR1225 | IP3000 | JC5040 | DT4<br>DM4<br>QM3 | CP500 | KC5025<br>KC5525<br>KCU25 | IC328<br>IC928<br>IC3028 | TT9030<br>TT8020 | WS25PT | WSM30 | CTP1235<br>CTP1625<br>CTP2235 |
| | P40 | **AH120<br>AH725<br>AH645** | | AC530U | | | | | | CP500 | | IC328<br>IC3028 | TT8020 | | | CTP1235<br>CTP2235 |
| M | M01 | | | | | | | | | | | IC520 | | | WXM10 | |
| | M10 | **AH630** | VP10RT | | GC1105<br>GC1115<br>GC1525 | PR1025<br>PR1215 | IP100S<br>IP050S | JC5003<br>JC8015 | TM4<br>ZM3 | TS2000<br>TS2500<br>CP200 | KC5010<br>KC5510<br>KCU10 | IC520<br>IC507<br>IC807<br>IC907 | | WS10PT | WSM10<br>WSM10S | |
| | M20 | **AH630<br>AH120<br>AH725<br>SH725<br>SH730** | VP10RT<br>VP15TF<br>VP20MF<br>VP20RT<br>UP20M | AC520U | GC1115<br>GC1125<br>GC1525 | PR930<br>PR1025<br>PR1125<br>PR1215<br>PR1425<br>PR1225 | IP100S<br>IP050S | JC5015<br>JC5030<br>JC8015 | TM4<br>ZM3<br>DT4<br>DM4 | TS2500<br>CP200<br>CP500 | KC5025<br>KC5525<br>KCU25 | IC520<br>IC507<br>IC807<br>IC907<br>IC308<br>IC3028 | TT9030<br>TT8010 | WS10PT<br>WS25PT | WSM20<br>WSM21<br>WSM20S | CTP1235<br>CTP2120 |
| | M30 | **AH645<br>AH120<br>AH725<br>SH725<br>SH730<br>J740** | VP15TF<br>VP20MF<br>VP20RT<br>UP20M<br>MP7035 | AC530U<br>AC6040M | GC1125<br>GC2035 | PR1125 | IP100S | JC5015<br>JC5030<br>JC5040 | TM4<br>ZM3<br>DT4<br>DM4 | CP500 | KC5025<br>KC5525<br>KCU25 | IC3028<br>IC308<br>IC908<br>IC928 | TT8020 | WS25PT | WSM30<br>WSM30S | CTP1235<br>CTP2120<br>CTP2235<br>CTP1625 |
| | M40 | **AH645** | MP7035 | AC530U<br>AC6040M | GC2035 | | | | | | | IC228<br>IC328 | | | | |
| K | K01 | **AH110** | | | | | | | | | | IC910 | | | | |
| | K10 | **GH110<br>AH110** | VP10RT | AC510U | | PR905<br>PR1215 | | JC5003<br>JC5015 | | TS2000<br>CP200 | KC5010<br>KC5510<br>KCU10 | IC910<br>IC308<br>IC508 | TT9030 | WS10PT | | CTP6215 |
| | K20 | **AH120** | VP10RT<br>VP20RT<br>VP15TF | | | PR905<br>PR1215 | | JC5015 | | TS2500<br>CP200<br>CP250 | KC5025<br>KC5525<br>KCU25 | IC910<br>IC308<br>IC508<br>IC928<br>IC1008 | TT9030 | WS10PT<br>WS25PT | | CTP6215 |
| | K30 | **AH120<br>GH130** | VP20RT<br>VP15TF | | | | | | | CP500 | | IC928<br>IC1008 | TT9030 | WS25PT | | CTP1625 |
| S | S01 | **AH8005** | VP05RT<br>MP9005 | | | | | JC8003 | | | | | | | WSM10 | |
| | S10 | **AH8005<br>AH8015** | VP10RT<br>MP9015 | AC510U<br>AC520U | GC1105 | PR1305<br>PR1310 | | JC8015<br>JC5015 | DT4<br>DM4 | TS2000<br>TS2500<br>CP200<br>CP500 | KC5010<br>KC5510<br>KCU10 | IC507<br>IC807<br>IC808<br>IC907<br>IC908 | TT8010 | WS10PT | WSM10<br>WSM10S | CTP2235 |
| | S20 | **AH8015** | VP15TF<br>MP9015<br>VP20RT | AC520U | GC1115<br>GC1125 | PR1310 | | JC8015<br>JC5015 | DT4<br>DM4 | TS2000<br>TS2500<br>CP200<br>CP500 | KC5025<br>KC5525<br>KCU25 | IC507<br>IC807<br>IC808<br>IC907<br>IC908 | TT8020 | WS10PT<br>WS25PT | WSM20<br>WSM21<br>WSM20S | CTP2235 |
| | S30 | **AH630<br>AH7025** | VP15TF<br>VP20RT | AC520U | GC1125 | PR1325 | | | | | | IC830<br>IC928 | | WS25PT | WSM30<br>WSM30S | |

Note: The above table is selected from a publication. We have not obtained approval from each company.

## Grade Comparison Chart

### ●Cermet for Turning

| ISO | | Tungaloy | Mitsubishi Carbide | Sumitomo Electric | Sandvik | Kyocera | Mitsubishi Hitachi Tool | Dijet | NTK | Seco Tools | Kennametal | Iscar | TaeguTec | Widia | Walter | Ceratizit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Classifi-cation | Symbol | | | | | | | | | | | | | | | |
| P | P01 | **NS520** | AP25N<br>VP25N | T110A<br>T1000A | | TN30<br>PV30<br>TN6010<br>PV7010 | | LN10 | Q15<br>C7Z | | KT1120 | | PV3010<br>CT3000 | | | |
| | P10 | **GT9530**<br>**J9530** | AP25N<br>VP25N<br>NX2525 | T1500Z<br>T2000Z<br>T1200A<br>T1500A | CT5015 | TN60<br>TN6010<br>PV7010<br>TN610<br>PV710 | CZ25 | CX50<br>PX75 | C7Z<br>Z15 | TP1020<br>C15M | KT315 | IC30N<br>IC530N | PV3010<br>CT3000 | TTI15 | WCE10 | TCC410<br>TCM10<br>TCM407 |
| | P20 | **GT9530**<br>**NS9530**<br>**J9530** | AP25N<br>VP25N<br>VP45N<br>NX2525<br>NX3025 | T1200A<br>T1500A<br>T1500Z<br>T2000Z | CT5015<br>GC1525 | TN90<br>TN6020<br>PV7020<br>PV7025<br>TN620<br>PV720 | CZ25<br>CH550 | CX75<br>PX75<br>PX90 | C7Z<br>T15 | TP1020<br>TP1030<br>C15M | KT5020 | IC30N<br>IC530N | PV3010<br>CT3000 | TTI15 | WCE10 | TCC410<br>TCM10 |
| | P30 | **NS9530** | VP45N<br>NX4545 | T3000Z | GC1525 | | | PX90 | N40<br>C7X | | | | | | | |
| M | M10 | **NS520** | AP25N<br>VP25N<br>NX2525 | T1000A<br>T2000Z | CT5015 | TN60<br>TN6020<br>PV7020<br>PV7025 | | LN10<br>CX50 | C7Z<br>C7X | TP1020<br>TP1030 | KT315<br>KT5020 | | PV3010<br>CT3000 | TTI15 | | TCC410<br>TCM10<br>TCM407 |
| | M20 | **GT9530**<br>**NS9530**<br>**J9530** | NX2525<br>AP25N<br>VP25N | T1500A<br>T2000Z | GC1525 | TN90<br>TN6020<br>PV7020<br>PV7025 | CZ25<br>CH550 | CX75 | C7Z<br>C7X | C15M | KT5020 | IC30N<br>IC530N | PV3010<br>CT3000 | | | |
| | M30 | **NS9530** | NX4545 | T3000Z | | | | | | | | | | | | |
| K | K01 | **NS520** | AP25N<br>VP25N | T1000A | | TN30<br>PV30<br>PV7005 | | LN10 | | | | | PV3010<br>CT3000 | | | TCC410 |
| | K10 | **GT9530**<br>**NS9530**<br>**J9530** | AP25N<br>VP25N<br>NX2525 | T1500A<br>T2000Z | CT5015 | TN60<br>TN6010<br>PV7005<br>PV7010 | CZ25<br>CH550 | LN10<br>CX75 | | | KT315<br>KT5020 | IC30N<br>IC530N | CT3000 | TTI15 | | TCC410<br>TCM10<br>TCM407 |
| | K20 | **NS9530** | AP25N<br>VP25N<br>NX2525 | T3000Z | | | | CX75 | | | KT5020 | | | | | TCM407 |

Note: The above table is selected from a publication. We have not obtained approval from each company.

## Grade Comparison Chart

### ●Cemented Carbide for Turning

| ISO | | Tungaloy | Mitsubishi Carbide | Sumitomo Electric | Sandvik | Kyocera | Mitsubishi Hitachi Tool | Dijet | NTK | Seco Tools | Kennametal | Iscar | Ingersoll | TaeguTec | Widia | Walter | Ceratizit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Classification | Symbol | | | | | | | | | | | | | | | | |
| P | P01 | | | | | | | | | | | | | | | | |
| | P10 | **TH10** | | ST10P | | | WS10 | SRT | | | P10 | IC70 | | P10 | TN15U | | |
| | P20 | **KS20** | UTi20T | ST20E | SMA<br>H10F | | EX35 | SRT<br>SR20 | KM1 | S10M | K125M<br>TTM | IC70 | P40 | P20 | TN15U | | |
| | P30 | **KS15F**<br>**UX30** | UTi20T | A30<br>A30N | SM30<br>H10F | PW30 | EX40 | DX30<br>SR30 | KM3 | S25M | GK<br>K600<br>TTR | IC28<br>IC54 | P40 | P30 | | | S40T |
| | P40 | **TX40** | | ST40E | | | EX45 | SR30 | | S60M | G13 | IC28<br>IC54 | | P40 | | | S40T |
| M | M01 | | | | | | | | | | | | | | | | |
| | M10 | **TH10** | | U10E<br>EH510 | H10A | | WA10B | UMN | KM1 | 890 | K313 | IC20 | | M10 | TN15U<br>WU10HT | | |
| | M20 | **KS20** | UTi20T | U2<br>EH520 | H13A | | EX35 | DX25<br>UMS | | HX<br>883 | K68<br>KMF<br>K125M<br>TTM | IC20 | IN30M | M20 | TN15U<br>WU10HT | | CTW7120<br>H210T |
| | M30 | **UX30** | UTi20T | A30<br>A30N | H10F<br>SM30 | | EX45 | UMS | | | GK<br>K600<br>TTR | IC28 | IN30M | | | | |
| | M40 | **TU40** | | | | | | UM40 | | | G13 | IC28 | IN30M | M40 | | | S40T |
| K | K01 | **KS05F** | HTi05T | H2<br>H1 | | | WH01<br>WH05 | KG03 | | | K605 | | | UF1 | TN15U<br>WU10HT | | |
| | K10 | **TH10** | HTi10 | H1<br>EH10<br>EH510 | H10 | KW10 | WH10 | KG10<br>KT9<br>CR1 | KM1 | 890 | K313<br>K110M<br>THM<br>THM-U | IC20<br>IC09T | IN05S | K10 | TN15U<br>WU10HT | | H210T<br>H216T<br>H10T |
| | K20 | **KS15F**<br>**KS20** | UTi20T | G10E<br>EH20<br>EH520 | H13A<br>H10F | KW10<br>GW15 | WH20 | KT9<br>CR1<br>KG20<br>FB15 | | 890<br>HX<br>883 | K715<br>KMF<br>K600 | IC20<br>IC09T | IN05S<br>IN10K<br>IN15K<br>IN30M | K20 | TN15U<br>WU10HT | | CTW7120<br>H210T<br>H216T<br>H10T |
| | K30 | | UTi20T | G10E | H13A<br>H10F | GW25 | | KG30 | | 883 | THR | IC28 | IN10K<br>IN15K<br>IN30M | K30 | | | |
| | K40 | | | | | | | | | | G13 | | IN30M | | | | |
| N | N01 | **KS05F** | | H1 | H10 | KW10 | | | | | K605 | IC20 | | | | | |
| | N10 | **TH10** | HTi10 | H1 | H10<br>H10F | GW15 | WH10 | KT9<br>CR1 | KM1 | 890<br>HX<br>KX<br>H15 | K313<br>K110M<br>THM<br>THM-U | IC20<br>IC28 | IN05S<br>IN10K | K10 | TN15U<br>WU10HT | WK1<br>WK10 | H210T<br>H216T<br>H10T |
| | N20 | **KS15F** | | | H10F<br>H13A | | WH20 | KT9<br>CR1 | KM1 | 890<br>HX<br>KX<br>883 | K715<br>KMF<br>K600 | IC20<br>IC28 | IN10K<br>IN15K | K20 | TN15U<br>WU10HT | WK1<br>WK10 | CTW7120<br>H210T<br>H216T<br>H10T |
| | N30 | | | | | | | | | 883<br>H25 | G13<br>THR | | IN15K<br>IN30M | | | WK40<br>WMG40 | |
| S | S01 | | RT9005 | | | | | | | | | IC20 | | | | | |
| | S10 | **KS05F**<br>**TH10** | RT9005<br>RT9010 | EH510 | H10<br>H10A | KW10 | WH10 | KG10 | KM1 | 890<br>883 | K10<br>K313<br>THM | IC20 | IN05S<br>IN10K | K10 | TN15U<br>WU10HT | WK1 | H210T<br>H216T<br>H10T |
| | S20 | **KS15F**<br>**KS20** | RT9010<br>TF15 | EH520 | H10F<br>H13A | GW25 | WH20 | KG20 | KM1 | 890<br>883<br>H25 | K715<br>KMF | IC20<br>IC28 | IN10K<br>IN15K | K20 | TN15U<br>WU10HT | WK1<br>WMG40 | CTW7120<br>H210T<br>H216T<br>H10T |
| | S30 | | TF15 | | | | | | | 883 | G13<br>K600<br>THR | | IN15K<br>IN30M | | | WMG40 | |
| H | H01 | | | | | | | KG03 | | | | IC20 | | | | | |
| | H10 | **TH10** | | | H13A | | | FZ05 | | | | IC20 | IN10K | K10 | | | |
| | H20 | | | | | | | FZ15 | | 890<br>HX<br>883 | | | IN15K | | | | |

Note: The above table is selected from a publication. We have not obtained approval from each company.

## Grade Comparison Chart

### ●PCBN and PCD for Turning

| ISO | | Tungaloy | Mitsubishi Carbide | Sumitomo Electric | Sandvik | Kyocera | Dijet | NTK | Seco Tools | Kennametal | Iscar | Ingersoll | TaeguTec | Widia | Walter | Ceratizit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Classifi-cation | Symbol | | | | | | | | | | | | | | | |
| K | K01 | **BX930 BX910 BX870** | MB710 MB730 MB5015 | BN500 BNC500 | CB7525 CB7050 CB50 | KBN60M | | B52 | | KB9610 KD120 KB1630 | IB10K | | KB90 | WBH10C | WCB80 | TA100 CTL3215 |
| | K10 | **BX470 BX480 BX950** | MB710 MB730 | BN7000 BN7500 BN500 BNC500 | CB7050 CB7925 CB50 | KBN60M | JBN795 | B23 B30 B52 | CBN200 CBN300 CBN400C CBN010 | KB9640 KD120 KB1630 | IB05S IB10S | | KB90A | WBK40U | WCB80 WCB50 | TA120 TA201 CTL3215 |
| | K20 | **BXC90 BX90S** | MB730 MBS140 | BNS800 | CB7050 | KBN900 | | B23 B30 B52 | CBN300 CBN500 CBN600 CBN010 | KB1340 KB1345 | IB90 IB25KD | | | WBK45U | WCB80 | CTL3215 |
| | K30 | **BXC90 BX90S** | MBS140 | BNS800 | | KBN900 | | B16 | CBN500 CBN600 | KB1340 KB1345 | | | | | | |
| S | S01 | **M714B** | MB730 | BN350 | | | JBN795 | JP2 | CBN170 | | | | KB90 | | | |
| | S10 | **BX470 BX480 BX950** | MB4020 | BN7500 | CB7050 | KBN65B KBN65M | | B23 B30 | CBN200 | KB1630 | IB05S IB10S | | KB90A | WBK45U | WCB80 | TA201 |
| H | H01 | **BXM10 BX310** | BC8110 MBC010 MB810 | BNC100 BNC160 BNC2010 BNX10 BN1000 | CB20 | KBN510 KBN10C KBN05M KBN10M | | B52 B5K | CBN10 CBN100 CBN160C CBN050C | KB1610 KB5610 | IB05H IB10HC | | KB50 | WBH10C | WCB30 | |
| | H10 | **BXM10 BX330 BX530** | BC8110 MBC020 MB8025 | BNC160 BNC200 BNC2020 BN250 BN1000 | CB7015 CB7025 CB20 CB50 | KBN525 KBN05M KBN10M KBN25M | JBN245 | B36 B52 B6K | CBN150 CBN200 CBN300 CBN060K CBN050C CBN160C CBN300P CBN400C | KB9610 KB1610 KB5610 | IB50 IB55 IB10H IB10HC IB20H IB25HA | | KB50 TB650 | WBH10C WBH10P WBH10U | WCB30 WCB50 | CTL3215 TA100 |
| | H20 | **BXM20 BXA20 BX360** | MBC020 BC8120 MB8025 MB825 | BNC200 BNC2020 BN250 BNX20 BNX25 BN2000 | CB7025 CB20 CB7035 | KBN525 KBN05M KBN10M KBN25M | JBN300 JBN330 | B22 B36 B40 B6K | CBN150 CBN200 CBN300 CBN060K CBN160C CBN300P CBN400C | KB5625 KB1625 | IB20H IB20HC IB25HA IB25HC | | TB650 | WBH25P | WCB50 WCB80 | CTL3215 TA120 |
| | H30 | **BXC50 BX380** | MB835 | BNC300 BN350 BNX25 | CB7525 | KBN35M KBN900 | JBN300 JBN330 | B22 B40 | CBN500 | KB1630 KB9640 | IB25HC | | | WBH40C | | TA201 |
| N | N01 | **DX160 DX180** | MD205 | DA90 | CD10 | KPD001 | JDA30 JDA735 | | | KD1400 KD1405 KD100 | ID5 | | | | WCD10 | CTD4125 |
| | N10 | **DX140** | MD205 MD220 | DA150 | CD10 | KPD001 KPD010 KPD230 | JDA715 | PD1 | PCD05 PCD10 | KD100 KD1400 KD1425 | ID5 | IN90D | KP500 | WDN25U | WCD10 | CTD4125 CTD4110 |
| | N20 | **DX120** | MD220 MD230 | DA2200 DA1000 | CD10 | KPD001 KPD010 KPD230 | JDA715 | PD1 | PCD05 PCD20 | KD1425 | | IN90D | KP300 | WDN25U | WCD10 | CTD4205 |
| | N30 | **DX110** | MD230 | DA2200 DA1000 | | | JDA10 | | OVD20 PCD30 PCD30M | | | | KP100 | | | |

Note: The above table is selected from a publication. We have not obtained approval from each company.

## Grade Comparison Chart

### ●Ceramics for Turning

| ISO | | Tungaloy | Mitsubishi Carbide | Sumitomo Electric | Sandvik | Kyocera | Mitsubishi Hitachi Tool | Dijet | NTK | Seco Tools | Kennametal | Iscar | Ingersoll | TaeguTec | Widia | Walter | Ceratizit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Classifi-cation | Symbol | | | | | | | | | | | | | | | | |
| K | K01 | **LX11**<br>**LX21** | | NB90S<br>NB90M | CC6190<br>CC650 | KA30<br>A65<br>KT66<br>PT600M | | | HC1<br>HW2<br>SE1<br>HC2 | | KY1310<br>KY1615 | | | AW20<br>AB30<br>AS10 | CW2015 | | CTN3105<br>CTS3105 |
| | K10 | **CX710**<br>**FX105** | | | CC6190<br>CC650 | A65<br>KT66<br>A66N<br>PT600M | | | HC1<br>HW2<br>SE1<br>WA1<br>WA5 | | KY1310<br>KY1320<br>KY1615<br>KY3400 | | IN70N | AB30<br>AS10 | CW2015<br>CW5025 | WSN10 | CTN3105<br>CTM3110<br>CTI3105<br>CTN3110<br>CTS3105 |
| | K20 | **FX105**<br>**CX710** | | | CC6190 | KS6000 | | | SP9<br>SX1<br>SX8<br>SX9 | | KY1320<br>KY3400<br>KY3500<br>KY4300 | | IN70N | AS10 | CW5025 | WSN10 | CTM3110<br>CTN3110 |
| S | S01 | | | | | | | | JX1 | | KY1525<br>KY2100 | | | | | | |
| | S10 | **WG300** | | WX120 | CC670<br>CC6060<br>CC6065 | CF1 | | | WA1<br>WA5<br>SX9 | | KY1525<br>KY1540<br>KY2100<br>KY4300 | | | AS20<br>TC430 | CW3020 | | |
| H | H01 | **LX11** | | NB100C | CC6050<br>CC650 | A65<br>KT66<br>A66N<br>PT600M | | | ZC4<br>ZC7 | | KY4300 | | | AW20 | CW2015 | | CTS3105 |
| | H10 | **WG300** | | NB100C | CC6050<br>CC670<br>CC6190 | A65<br>KT66<br>A66N<br>PT600M | | | HC4<br>HC7<br>WA1 | | KY1615<br>KY4400 | | | AB2010<br>AB20<br>AB30 | CW2015 | | CTS3105 |

Note: The above table is selected from a publication. We have not obtained approval from each company.

## Grade Comparison Chart

### ●CVD Coated Grade for Milling

| ISO | | Tungaloy | Mitsubishi Carbide | Sumitomo Electric | Sandvik | Kyocera | Mitsubishi Hitachi Tool | Dijet | NTK | Seco Tools | Kennametal | Iscar | Ingersoll | TaeguTec | Widia | Walter | Ceratizit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Classifi-cation | Symbol | | | | | | | | | | | | | | | | |
| P | P01 | | | | | | | | | | | IC9015<br>IC5400<br>IC8080<br>IC9080 | | | TN2510 | | |
| | P10 | | FH7020 | ACP100 | GC4220<br>GC4230 | | | JC730U | | MP1500 | KCPM20 | IC9015<br>IC5400<br>IC8080<br>IC9080<br>IC4100<br>IC5100 | | | TN2510<br>TN7525 | WKP25 | GM226+ |
| | P20 | **T3225** | FH7020<br>F7030 | ACP100 | GC4220<br>GC4230 | | GX2140<br>GX2160 | JC730U | | MP1500<br>MP2500<br>T25M | KCPM20<br>KCPK30<br>KCPM30<br>KC927M | IC8080<br>IC9080<br>IC4100<br>IC5100<br>IC9250<br>IC520M | IN6530 | TT7800 | TN7525<br>TN7535 | WKP25<br>WKP35<br>WKP35S | GM226+ |
| | P30 | **T3130**<br>**T3225** | F7030 | ACP100 | GC4230<br>GC4240<br>GC2040 | | GX2140<br>GX2160 | | | MP1500<br>MP2500<br>T350M<br>T25M | KCPK30<br>KCPM30<br>KC927M | IC9250<br>IC520M<br>IC4050<br>IC635 | IN6530 | TT7800 | TN7525<br>TN7535 | WKP25<br>WKP35<br>WKP35S | GM226+<br>GM246<br>GM43+ |
| | P40 | | | | GC4230<br>GC4240<br>GC2040 | | GX2160 | | | MM4500<br>T350M | KCPK30<br>KCPM30 | IC4050<br>IC635 | IN6530 | TT7800 | TN7535 | WKP35<br>WKP35S | GM246<br>GM43+ |
| M | M10 | | | ACM200 | GC2015 | | | JC730U | | | KCPM20 | IC9250<br>IC520M<br>IC9350 | | | TN7525 | | |
| | M20 | **T3225** | F7030 | ACM200 | GC4230 | CA6535 | | JC730U | | MP2500<br>T350M<br>T25M | KCPM20<br>KCPM30<br>KC927M | IC9250<br>IC520M<br>IC9350<br>IC4050<br>IC635 | IN6530 | TT7800 | TN7525<br>TN7535 | | CTC5235<br>GM226+ |
| | M30 | **T3225**<br>**T3130** | F7030 | ACM200 | GC2040<br>GC4230<br>GC4240<br>S40T | CA6535 | GX2160 | JC730U | | MP2500<br>T350M<br>T25M | KCPM30<br>KC927M | IC9350<br>IC4050<br>IC635 | IN6530 | TT7800 | TN7525<br>TN7535 | | CTC5235<br>CTC5240<br>GM226+<br>GM246<br>GM43+ |
| | M40 | | | | GC2040<br>GC4240<br>S40T | CA6535 | GX2160 | | | MM4500<br>T350M | | IC635 | IN6530 | | TN7535 | | CTC5235<br>CTC5240<br>GM246<br>GM43+ |
| K | K01 | | MC5020 | ACK200 | | CA420M | | JC605W | | | KC907M | IC8080<br>IC4100<br>IC5100<br>IC9150 | | | TN2510<br>TN5505 | WKP15 | CTC3215 |
| | K10 | **T1215**<br>**T1115** | MC5020 | ACK200 | GC3220 | CA420M | GX2120 | JC605W<br>JC608X<br>JC610 | | MK1500 | KC907M<br>KC914M<br>KC917M<br>KC924M<br>KCK15 | IC8080<br>IC4100<br>IC5100<br>IC9150<br>IC9080<br>IC520M | | TT6800 | TN2510<br>TN5505<br>TN5515<br>TN5520 | WKP15<br>WKP25 | CTC3215<br>SR216<br>SR226+ |
| | K20 | **T1215** | MC5020 | ACK200 | GC3220<br>GC3330<br>GC3040<br>GC4220<br>GC4230 | CA420M | GX2120<br>GX2140 | JC605W<br>JC608X<br>JC610 | | MK1500<br>MP1500 | KC917M<br>KC924M<br>KCK15<br>KCPM20<br>KCPK30<br>KC927M | IC5100<br>IC9150<br>IC9080<br>IC520M<br>IC4050 | IN6515<br>IN6530 | TT6800 | TN5515<br>TN5520 | WKP15<br>WKP25<br>WKP35<br>WKP35S | SR216<br>SR226+ |
| | K30 | | MC5020 | | GC3330<br>GC3040<br>GC4220<br>GC4230<br>GC4240 | | GX2140 | JC610 | | MK1500<br>MP1500 | KCPM20<br>KCPK30<br>KC927M | IC520M<br>IC4050 | IN6515<br>IN6530 | | | WKP25<br>WKP35<br>WKP35S | |

Note: The above table is selected from a publication. We have not obtained approval from each company.

## Grade Comparison Chart

### ●PVD Coated Grade for Milling

| ISO | | Tungaloy | Mitsubishi Carbide | Sumitomo Electric | Sandvik | Kyocera | Mitsubishi Hitachi Tool | Dijet | NTK | Seco Tools | Kennametal | Iscar | Ingersoll | TaeguTec | Widia | Walter | Ceratizit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Classification | Symbol | | | | | | | | | | | | | | | | |
| P | P01 | **AH710 AH110** | | | GC1010 | | ATH80D JP4105 | JC8003 | | | KC505M KC510M KC515M | IC903 | | TT2510 TT5505 | TN2505 TN6505 | | |
| | P10 | **AH120 AH725** | MP6120 VP15TF | ACP200 | GC1010 GC1025 | PR830 PR1225 PR1230 PR1525 | ATH80D PN08M ATH10E PN15M JP4105 JP4115 JP4120 | JC8003 JC8015 JC5015 JC5118 | DM4 | | KC505M KC510M KC515M KC610M KC715M | IC903 IC907 IC950 IC908 IC910 IC380 IC900 | IN2505 | TT2510 TT5505 TT5515 TT7080 | TN2505 TN2525 TN6425 TN6505 | WHH15 WXM15 | |
| | P20 | **AH120 AH725 AH3135 AH9030** | MP6120 VP15TF MP6130 UP20M VP20RT | ACP200 ACP300 | GC1025 GC1030 GC2030 | PR830 PR1225 PR1230 PR1525 | JP4120 JS4045 CY250 | JC8015 JC5015 JC5118 JC5040 | | MP3000 F25M | KC522M KC525M KC527M KC530M KC610M KC620M KC635M KC715M KC720M KC730M | IC907 IC950 IC908 IC910 IC380 IC900 IC830 IC928 IC1008 | IN2040 IN2505 IN4005 IN4030 | TT2510 TT5505 TT5525 TT7080 TT9030 TT9080 | TN2525 TN6425 TN6430 TN6525 | WHH15 WXM15 | CTP1235 CTP1625 |
| | P30 | **AH120 AH725 AH3135 AH130 AH6030** | MP6120 VP15TF MP6130 UP20M VP20RT VP30RT | ACP200 ACP300 | GC1025 GC1030 GC2030 | PR830 PR1225 PR1230 PR1525 | JS4045 CY250 JM4160 | JC5118 JC5040 JC8050 JC7560 | | MP3000 F25M F30M F40M | KC525M KC527M KC530M KC537M KC610M KC620M KC720M KC725M KC730M KC735M | IC907 IC950 IC908 IC910 IC380 IC900 IC830 IC928 IC1008 | IN2040 IN2505 IN2530 IN4005 IN4030 | TT5525 TT7080 TT8020 TT8080 TT9030 TT9080 | TN6430 TN6525 TN6540 | WSP45 WSP46 | CTP1235 CTP1625 CTP2235 |
| | P40 | **AH140** | VP30RT | ACP300 | GC1030 GC2030 | | JM4160 | JC5118 JC5040 JC8050 JC7560 | | MP3000 F40M T60M | KC537M KC720M KC725M KC735M | IC830 IC928 IC1008 | IN2040 IN2530 IN4005 IN4030 | TT8020 | TN6540 | WSP45 WSP46 | CTP1235 CTP2235 |
| M | M01 | | | ACM100 ACK300 | GC1010 | | PCS08M | | DM4 | | | IC907 IC903 | | | | | |
| | M10 | **AH725** | VP15TF | ACM100 ACK300 ACP300 | GC1010 GC1025 GC1030 GC2030 | PR830 PR1225 PR1525 PR1535 | PCS08M CY150 | | DM4 | | KC515M KC610M KC635M KC720M | IC907 IC903 | IN2505 | TT5525 TT9030 TT9080 | TN6425 TN6525 | WXM15 | |
| | M20 | **AH725 AH3135 AH130 AH6030** | VP15TF MP7130 MP7030 UP20M VP20RT | ACM300 ACP300 | GC1025 GC1030 GC1040 GC2030 | PR830 PR1225 PR1525 PR1535 | CY150 CY250 | JC8015 JC5015 JC5118 | DM4 | MP3000 MS2050 F25M F30M | KC522M KC525M KC530M KC610M KC635M KC720M KC730M | IC380 IC900 IC908 IC928 IC1008 | IN2005 IN2505 IN2530 IN4005 | TT8020 TT8080 | TN6425 TN6525 | WXM15 WSM35 WSM36 | CTP1235 CTP1625 |
| | M30 | **AH3135 AH130** | VP15TF MP7130 MP7030 UP20M VP20RT MP7140 VP30RT | ACM300 | GC1040 GC2030 | PR830 PR1225 PR1525 PR1535 | CY250 JM4160 | JC8015 JC5015 JC5118 JC8050 JC7560 | | MP3000 MS2050 F30M F40M | KC522M KC525M KC530M KC537M KC725M KC730M KC735M | IC380 IC900 IC908 IC928 IC1008 IC328 IC330 | IN2005 IN2505 IN2530 IN4005 IN4030 | TT8020 TT8080 | TN6540 | WSM35 WSM36 WSP45 WSP46 | CTP1235 CTP2235 |
| | M40 | **AH140** | MP7140 VP30RT | ACM300 | GC1040 | PR1225 PR1525 PR1535 | JM4160 | JC5015 JC5118 JC8050 JC7560 | | MS2050 F40M | KC725M | IC1008 IC328 IC330 | IN2005 IN2530 IN4005 IN4030 | TT8020 | TN6540 | WSM35 WSM36 WSP45 WSP46 | CTP2235 |
| K | K01 | **AH110** | MP8010 | | GC1010 | PR1510 | ATH80D JP4105 | JC8003 | | | | IC380 IC900 | | TT6080 | TN2505 TN6405 TN6505 | | AMZ |
| | K10 | **AH110 AH120** | MP8010 VP15TF | | GC1010 GC1020 | PR1210 PR1510 | ATH80D JP4105 JP4120 CY150 | JC8015 | | MK2050 | KC514M KC515M KC520M KC620M | IC380 IC900 IC810 IC910 | IN2015 IN2505 IN4015 | TT6080 | TN2505 TN6405 TN6505 TN6510 | WHH15 WXM15 WKK25 | AMZ CTP3220 CTP6215 |
| | K20 | **AH120 AH9030** | MP8010 VP15TF VP20RT | ACK300 | GC1020 | PR1210 PR1510 | JP4120 CY150 CY250 | JC8015 JC5015 | | MK2050 | KC514M KC520M KC522M KC524M KC527M KC610M KC620M KC635M | IC810 IC910 IC950 IC350 IC830 IC928 | IN2015 IN2505 IN4015 IN4030 | | TN2525 TN6510 TN6520 TN6525 | WHH15 WXM15 WKK25 | CTP3220 CTP1625 |
| | K30 | **AH120** | VP15TF VP20RT | ACK300 | | PR1510 | CY250 | JC8015 JC5015 | | MK2050 | KC522M KC524M KC527M KC537M KC610M KC620M KC635M | IC830 IC928 IC1008 IC808 IC908 | IN2015 IN2505 IN4015 IN4030 | | TN6430 TN6525 TN6540 | WKK25 | |

## ●PVD Coated Grade for Milling

| ISO | | Tungaloy | Mitsubishi Carbide | Sumitomo Electric | Sandvik | Kyocera | Mitsubishi Hitachi Tool | Dijet | NTK | Seco Tools | Kennametal | Iscar | Ingersoll | TaeguTec | Widia | Walter | Ceratizit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Classification | Symbol | | | | | | | | | | | | | | | | |
| N | N01 | | | | | | | | | | KC410M<br>KC510M<br>KC5410 | | | TT6080 | TN6501 | | AMZ |
| | N10 | **DS1100** | | DL1000 | GC1025<br>GC1030 | | SD5010<br>HD7010 | | | | KC410M<br>KC510M<br>KC5410<br>KC620M | | | TT6080<br>TT8020 | TN6501<br>TN6502 | WXN15 | AMZ |
| | N20 | **DS1200** | LC15TF | DL1000 | GC1025<br>GC1030 | | SD5010<br>HD7010 | | | F15M | KC422M<br>KC620M | | | TT8020 | | WXN15 | |
| S | S01 | **AH110**<br>**AH710** | | ACM100<br>ACK300 | GC1010 | PR905<br>PR1210<br>PR1535 | | JC8003<br>JC8015 | | | KC510M | IC808<br>IC907<br>IC908 | | | TN6405 | | AMZ |
| | S10 | **AH120**<br>**AH725** | MP9120<br>VP15TF<br>MP9130<br>MP9030 | ACM100<br>ACK300 | S30T<br>GC1010<br>GC1030<br>GC2030 | PR905<br>PR1210<br>PR1535 | PTH13S<br>JS1025 | JC8003<br>JC8015<br>JC5015<br>JC5118 | | MS2050 | KC510M<br>KC610M | IC808<br>IC907<br>IC908<br>IC903 | IN2505<br>IN2530 | TT9030<br>TT9080<br>TT8080 | TN6405<br>TN6425 | | AMZ<br>CTP1625 |
| | S20 | **AH725**<br>**AH130**<br>**AH6030** | MP9120<br>VP15TF<br>MP9130<br>MP9030 | ACM300 | S30T<br>GC1030<br>GC1040<br>GC2030<br>GC2040 | PR905<br>PR1210<br>PR1535 | PTH13S<br>JS1025 | JC8015<br>JC5015<br>JC5118<br>JC8050<br>JC7560 | | MS2050<br>F40M | KC522M<br>KC525M<br>KC610M | IC300<br>IC900<br>IC830<br>IC928 | IN2505<br>IN2530 | TT8080<br>TT8020 | TN6425 | WSM35<br>WSM36 | CTP1235<br>CTP1625 |
| | S30 | **AH130** | MP9130<br>MP9030 | ACM300 | S30T<br>GC1040<br>GC2040 | PR1535 | | JC5118<br>JC8050<br>JC7560 | | MS2050<br>F40M | KC522M<br>KC525M<br>KC725M | IC830<br>IC928 | IN2530 | TT8020 | TN6540 | WSM35<br>WSM36<br>WSP45<br>WSP46 | CTP1235<br>CTP2235 |
| H | H01 | **AH110** | MP8010 | | GC1010 | | | DH102<br>JC6102<br>JC8003<br>JC8008 | | | KC510M | IC903 | | TT2510<br>TT5505 | TN2505 | | |
| | H10 | **AH110**<br>**AH120** | MP8010<br>VP15TF | | GC1010<br>GC1025<br>GC1030 | | PTH08M<br>JP4105 | JC6102<br>JC8003<br>JC8008<br>JC8015<br>JC5118 | | MH1000<br>F15M | KC505M<br>KC510M<br>KC635M | IC903<br>IC808<br>IC907<br>IC908 | | TT5515<br>TT6080 | TN2505<br>TN2525 | WHH15 | CTP6215 |
| | H20 | **AH120**<br>**AH725**<br>**AH9030** | VP15TF | | GC1025<br>GC1030 | | JP4105 | JC8015<br>JC5118 | | F15M | KC635M | IC808<br>IC907<br>IC908<br>IC380<br>IC900 | | TT5515<br>TT6080 | TN2525 | WHH15 | CTP6215 |
| | H30 | | | | | | | | | MP3000<br>F30M | | IC380<br>IC900<br>IC1008 | | | | | |

Note: The above table is selected from a publication. We have not obtained approval from each company.

## Grade Comparison Chart

### ●Cermet for Milling

| ISO | | Tungaloy | Mitsubishi Carbide | Sumitomo Electric | Sandvik | Kyocera | Mitsubishi Hitachi Tool | Dijet | NTK | Seco Tools | Kennametal | Iscar | Ingersoll | TaeguTec | Widia | Walter | Ceratizit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Classifi-cation | Symbol | | | | | | | | | | | | | | | | |
| P | P01 | | | T250A | CT530 | TN60<br>TN100M | MZ1000 | | | | | | IN0560 | CT3000 | | | TCC410 |
| | P10 | **NS740** | NX2525 | T250A | CT530 | TN60<br>TN100M<br>TC60M | MZ1000<br>MZ2000<br>CH550 | NIT<br>CX75<br>CX90 | | MP1020 | KTPK20 | IC30N | IN0560<br>IN60C | CT3000<br>CT7000 | TTI25 | | TCC410<br>TCM10 |
| | P20 | **NS740** | NX2525<br>NX4545 | T250A<br>T4500A | | TN60<br>TN100M<br>TC60M | MZ2000<br>MZ3000<br>CH500<br>CH7030 | NIT<br>CX75<br>CX90<br>SC30 | | MP1020 | KTPK20 | IC30N | IN60C | CT3000<br>CT7000 | TTI25 | | TCM10 |
| | P30 | | NX4545 | T4500A | | | MZ3000<br>CH7035 | | C7X | | | IC30N | IN0545 | CT7000 | | | |
| M | M10 | **NS740** | NX2525 | T250A | CT530 | TN60<br>TN100M<br>TC60M | MZ1000<br>CH550 | NIT<br>CX75 | | | KTPK20 | IC30N | IN0560 | CT3000<br>CT7000 | TTI25 | | TCC410 |
| | M20 | **NS740** | NX2525<br>NX4545 | T250A<br>T4500A | | TN60<br>TN100M<br>TC60M | MZ2000<br>MZ3000<br>CH500<br>CH7030 | NIT<br>CX75<br>SC30 | C7X | MP1020 | KTPK20 | IC30N | | CT7000 | TTI25 | | TCC410<br>TCM10 |
| | M30 | | NX4545 | T4500A | | | MZ3000<br>CH7035 | SC30 | | | | | | | | | |
| K | K01 | | | | | | MZ1000<br>CH550 | NIT | | | | | | | | | TCC410 |
| | K10 | **NS740** | NX2525 | | | | MZ2000<br>MZ3000<br>CH500<br>CH7030 | NIT<br>CX75 | | | KTPK20 | | | CT7000 | | | TCC410<br>TCM10 |
| | K20 | | | | | | MZ2000<br>MZ3000<br>CH500<br>CH7030<br>CH7035 | CX75 | | | KTPK20 | | | | | | |

Note: The above table is selected from a publication. We have not obtained approval from each company.

## Grade Comparison Chart

### ●Cemented Carbide for Milling

| ISO | | Tungaloy | Mitsubishi Carbide | Sumitomo Electric | Sandvik | Kyocera | Mitsubishi Hitachi Tool | Dijet | NTK | Seco Tools | Kennametal | Iscar | Ingersoll | TaeguTec | Widia | Walter | Ceratizit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Classifi-cation | Symbol | | | | | | | | | | | | | | | | |
| P | P01 | | | | | | | | | | | | | | | | |
| | P10 | | | | | | | | | | | | | | | | S26T |
| | P20 | | UTi20T | A30N | | | EX35 | | | | K125M | IC50M | | P30 | TTM | | S26T |
| | P30 | **UX30** | UTi20T | A30N | SM30 | | EX40 | | | | K125M | IC50M<br>IC28 | | P30 | TTM<br>TTR | | S26T |
| | P40 | | | | SM30 | | | | | | | IC28 | | | TTR | | |
| M | M01 | | | | | | | | | | | | | | | | |
| | M10 | | | | | | | | | | | IC20<br>IC07<br>IC08 | | | | | S26T |
| | M20 | | UTi20T | | SM30 | | | | | | | IC07<br>IC08 | | | TTM | | S26T |
| | M30 | | UTi20T | A30N | SM30 | | | | | | | IC28 | | | TTM<br>TTR | | S26T |
| | M40 | | | A30N | | | | | | | | IC28 | | | TTR | | |
| K | K01 | | | | | KW10 | | | | | K115M<br>K313 | | | K10 | THM-F | | |
| | K10 | **TH10** | HTi10 | G10E | H13A | KW10<br>GW25 | WH10 | | | | K115M<br>K313<br>K110M | IC20 | | K10 | THM-F<br>THM | | CTW4615<br>H216T |
| | K20 | | HTi10<br>UTi20T | G10E | H13A | KW10<br>GW25 | | | | HX | KMF | IC20 | IN10K | | THM<br>THR | | CTW4615<br>H216T |
| | K30 | | UTi20T | | | | | | | | KMF | | IN10K | | THR | | |
| | K40 | | | | | | | | | | | | IN10K | | | | |
| N | N01 | **KS05F** | HTi10 | | H10 | KW10 | | | | | K115M | | | | THM-U | WK10 | |
| | N10 | **TH10** | HTi10 | | H10<br>H13A<br>H10F | KW10<br>GW25 | WH10 | | | H15 | K115M<br>K313<br>K110M | IC20<br>IC08 | | K10<br>UF10 | THM-U<br>THM-F<br>THR-S | WK10 | CTW4615<br>H216T |
| | N20 | **KS15F** | HTi10<br>TF15 | H1 | H13A<br>H10F | KW10<br>GW25 | | | | HX<br>H15<br>H25 | KMF<br>K313<br>K110M | IC20<br>IC08<br>IC28 | | K10<br>UF10 | THM-F<br>THR-S<br>THM | WMG40 | CTW4615<br>H216T |
| | N30 | | TF15 | H1 | | | | | | H25 | KMF | IC28 | | | | WMG40 | |
| S | S01 | | | | | KW10 | | | | | K313 | IC20 | | | | | |
| | S10 | | | EH520 | H13A | KW10<br>GW25 | | FZ15 | | | K313<br>K110M | IC20<br>IC07<br>IC08 | | | THM-F | | |
| | S20 | **KS20** | | EH520 | H10F<br>H13A | KW10<br>GW25 | | FZ15 | | HX<br>H25 | KMF | IC20<br>IC07<br>IC08<br>IC28 | | | THM | | |
| | S30 | | | | H10F | | | | | | | IC07<br>IC08 | | | | | |
| H | H01 | | | | H1P | | | FZ05 | | | | | | | | | |
| | H10 | | | | H1P | | | FZ05<br>FZ15 | | | | IC20 | | | THM-F | | |
| | H20 | | | | | | | FZ15 | | | | | | | | | |

Note: The above table is selected from a publication. We have not obtained approval from each company.

## Chipbreaker Comparison Chart

### ●Negative insert type

| ISO Classification | Cuutting Mode | Tungaloy | Mitsubishi Carbide | Sumitomo Electric | Kyocera | Sandvik | Mitsubishi Hitachi Tool | Kennametal | Dijet | Iscar | TaeguTec | Widia | Walter | Ceratizit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Precision finishing | **01**<br>**TF** | PK<br>FH | FA | DP | QF | FE | FS , LF | PF | <br>SF , PP , TF | <br>FA | | | |
| | Finishing and light cutting | **TS , TSF**<br>**ZF**<br>**11 , NS**<br>**AS**<br>**TQ**<br>**NM**<br>**CB**<br>**C** | SA<br>FY<br>C<br>SH<br><br>MP | SU<br>FL<br><br>SE , SX | PQ , VF<br>CJ<br>PQ<br>GP , PP<br>HQ<br>GS<br>CQ | PF , QF<br>LC<br>MF<br>R/L-K | BE , BH<br><br>AB , CT<br><br><br><br>CE | FF , FN | UA , FT<br>UR , UT | F3P<br>NF , SF | FG<br>VF , EA<br>FC<br>MC<br><br><br>ML , MP | 4<br><br><br>AP | NF3<br>NS6 | CF , TF |
| | Finishing and light cutting (With Wiper) | **AFW , FW**<br>**ASW , SW** | SW | LUW<br>SEW<br><br>GUW | WP<br>WQ | WL , WF<br>WMX<br>WM , WR | | FW<br>MW<br>RW | | WF<br>WG | WS<br>WT | FW<br>MW | NF<br>NM | TFQ<br>TMQ |
| | Medium cutting | **TM , AM**<br>**DM , ZM**<br>**All-round** | MA<br>MH , MP | GU<br>GE , UX | HS , PT , GT<br>CS , PS | PM , QM<br>XM , XRM | AH<br>AE , AY , B | P<br>MN | PG , UB<br>GN<br>GNP | M3P , M3M<br>PP , TF , GN | PC , MT<br>MC , MG- | 48 | NMT , NM4 | TMF , TMM<br>M50 |
| | Medium to heavy cutting | **TH**<br>**THS** | RP , GH<br>HZ , HL | MU , ME<br>HG | PH<br>All-round | HM , PR<br>MR | RE | RN , RP<br>MR | GG , UD | NR<br>MR | RT | 49 | NM5 , NM6<br>NM9 | TM<br>TRM |
| | Heavy cutting | **TU**<br>**TRS**<br>**TUS** | HM , HX<br><br>HV | HG , HP<br>HU , HW<br>HF | PX | PR , MR<br>HR , QR | TE , UE<br>HX , HE<br>H | RM<br>RH | UC | R3P<br>NM | HT , HD<br>RX , RH<br>HY , HZ | | NR6<br>NRF<br>NRR | TRR , TR<br>R28 , R58<br>R88 |
| M | Finishing and light cutting | **SF , SA**<br>**SS** | GM , MS<br>SH , LM | EX , EG<br>SU , EF | GU<br>MQ | MF , XF<br>LC , R/L-K | MP<br>BH , AB | FP | SF | TF , VL | EA , SF , SU<br>FG | | NF4<br>NMS | CF , F30 , M34<br>F32 , TF |
| | Medium cutting | **SM**<br>**S** | MM , MA<br>ES | GU<br>HM | TK<br>MU | MM , QM<br>XM , XRM | PV , SE<br>DE | <br>MP , P | SZ | M3M , PP | EM , ET | | NM4 | TMF , M42<br>M30 , M52 |
| | Heavy cutting | **TH , SH**<br>**TU** | GH , RM , HZ | EM , MU | MS | MR<br>HM , PR | AH , AE | UP , RP | SG | MR , MH | | SR | NR4<br>NRT , NRS | TM , M60<br>TRM , TMR , TRR<br>R80 |
| K | Finishing | **CF** | LK, MA | UZ | C | KF , XF | Y , AH | FN | | GN | FG | | | CF |
| | Medium cutting | **CM**<br>**All-round** | MK<br>GK | GZ | ZS<br>All-round | KM , QM<br>XM , XRM | V, AE<br>VA | RP , UN | PG | | MT<br>MG | | NM5 | M50 |
| | Heavy cutting | **CH**<br>**Without chipbreaker** | RK<br>Without chipbreaker | <br>Without chipbreaker | GC<br>Without chipbreaker | KR<br>Without chipbreaker | RE<br>Without chipbreaker | Without chipbreaker | GG , UD<br>Without chipbreaker | | RT | | Without chipbreaker | TMR , TR<br><br>R28<br>R58 , R88 |
| N | Cutting of non-ferrous metals | **P** | | AX | AH , A3 | MF<br>QM | Without chipbreaker | MS , MP<br>MG | | PP | ML | | | F32 |
| S | Finishing | **HRF** | FJ , LS | EF<br>EX | MQ | SF<br>01 | | FS , LS<br>MS | | | SF | | NFT<br>NF4 | |
| | Medium cutting | **HRM**<br>**HMM**<br>**SA** | MS<br><br>RS , GJ | EG<br>MU | TK , MS , MU | MM , QM<br>SMR | | UP , P , NGP<br>RP | | PP | SU | SM | NMS<br><br>NM4 , NRS , NR4 | M34 , M52 |

Note: Above charts are based on published data and not authorized by each manufacturer.

## Chipbreaker Comparison Chart

### ●Positive insert type

| ISO Classification | Cuutting Mode | Tungaloy | Mitsubishi Carbide | Sumitomo Electric | Kyocera | Sandvik | Mitsubishi Hitachi Tool | Kennametal | Dijet | Iscar | TaeguTec | Widia | Walter | Ceratizit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Precision finishing | **01** | FV , SMG | FC , FW | CF<br>CK | | No sign<br>MP | UF | | SF | | 2 | PF2 | F32 |
| | Finishing and light cutting | **PSF , PF , SS**<br>**PS , PSS , TS**<br><br>**TSW**<br>**W08~20** | FP , FV , SV<br>LP<br><br>SW , MW<br>R/L , R/L-FD<br>R/L-FS<br>R/L-MV<br><br>R/L-F , R/L-L | FP , FZ , LU<br>FK , SS , SC<br>SU , SK , SF<br>US<br><br>LUW , SDW<br>W , SD<br>FX , FY | GQ , GK<br>GP , HQ<br>XP , XQ | R/L-K<br>PF , XF<br>UF , PM<br><br>WF , WK , WM | JQ | 11 , GM<br>LF | FT | PF<br>SM , 14 , 17<br>19 , XL<br><br>R/L<br>RF , LF<br><br>No sign | FA<br>FG<br><br>GF | 41 | PF5<br>PF4<br>PS5<br><br>PF , PM | SF<br>SMF<br><br>SMQ , 25Q |
| | Medium cutting | **PM**<br><br>**23**<br>**24**<br><br>**All-round**<br>**RS** | MP<br><br>MV<br>No sign | SU , MU<br><br>UJ<br>SC<br>(except for G-class inserts)<br><br>RP | All-round<br><br>VF , MF | PM , XM<br>UM , PR , XR<br>UR | JE | GM , MP , MR | GG | DT , HQ | MT<br><br><br><br>MT | 43 | PM5 | SM |
| | High-feed, small depth of cut cutting | **61** | No sign | | | No mark | WE | | | No sign<br>14 | No sign | No sign | | |
| M | Finishing | **PSF , SS** | FM , FV , SV | FC | | R/L-K<br>UF , MF | MP | GM , LF | | | FG | 41 | | |
| | finishing to Medium cutting | **PSS**<br>**PS** | LM<br>SV | | MQ | MM , XM<br>UM | JQ | MF | | | | | PF4 | SF , SMF |
| | Medium cutting | **PM** | MM , MV | MU | | MR , XR<br>UR | JE | | | | | | PM5 | F23 , F43<br>SM |
| K | Cutting of cast irons | **CM**<br>**Flat-top** | MK<br>Flat-top | Flat-top | Flat-top | KF , XF<br>KM , XM<br>UM , KR , XR | JQ , JE | Flat-top | Flat-top | 19 | MT<br>Flat-top | | PS5 , PM5<br>Flat-top | SF<br>25P<br>27 , 29 |
| N | Cutting of non-ferrous metals | **AL**<br>**PP**<br><br>**Ground** | AZ<br><br><br>R/L-F<br>R/L | AG<br>AX , AY | AH , A3 | AL | | GT-HP | | AS | FL | AL1,<br>AL2 , AL3 | PF2<br>PM2 | 23P<br>25P<br>27 , 29 |
| S | Finishing | **PSF** | FJ | FC | MQ | MF , UF , R/L-K | | | | | | | | SF |
| | finishing to Medium cutting | **PSS**<br>**PS** | | FX , FY | | MM , XM | | | | | | | | F23 |
| | Medium cutting | **All-round** | | SI | | UM , MR , UR , XR | | | | | FG | | PF2 , PF4 | SM , 25P , 29 |
| P<br>M<br>N<br>S | Turning on small lathes | **01**<br>**W08 , W15 , W20**<br>**J10**<br><br>**JRP , JSP , JPP**<br>**TS , JTS**<br>**TSW**<br>**SS , JSS**<br><br>**JS** | R/L-SR<br>R/L-SN<br>R/L-SS<br>FS , F<br><br><br><br>SW , MW<br><br><br><br>SMG | W , SD<br><br><br>FX , FY<br><br><br><br>LUW , SDW<br><br>LU , FP , FK , SU<br>FB , LB<br>FC , SI , SC | R/L-F , R/L-FSF<br>ER/L-U<br>FR/L-U<br>R/L-U<br>FR/L-U , R/L-USF<br><br>MF , R/L-FSF<br><br><br><br><br>GK<br>E-GK | F , M | No sign | | MF , MM<br><br>ALU , MM1<br><br>ASF<br>FT , ACB | | GF , GW | | PM5 | |

Note: Above charts are based on published data and not authorized by each manufacturer.

## Unified symbols for cutting conditions and tool dimensions

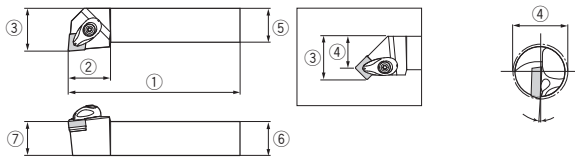
Japan Cutting & Wear-resistant Tool Association has standardized the quantity symbols for cutting conditions and tool specifications in order to avoid the confusion caused by each manufacturer's using its own symbols.

**(Quantity symbols of cutting conditions )** Symbol / Unit

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Turning | Cutting speed | | Feed | | Depth of cut | | Cutting edge width | | Min. bore diameter | |
| | *Vc* | m/min | *f* | mm/rev | *ap* | mm | *W* | mm | *øDm* | mm |
| | Power consumption | | Specific cutting force | | Theoretical surface roughness | | Corner radius | | Number of revolutions | |
| | *Pc* | *k*W | *kc* | MPa | *h* | μm | *rε* | mm | *n* | $min^{-1}$ |
| Milling | Cutting speed | | Feed speed | | Feed per tooth | | Feed | | Number of teeth | |
| | *Vc* | m/min | *Vf* | mm/min | *fz* | mm/t | *f* | mm/rev | z | |
| | Axial depth of cut | | Radial depth of cut | | Pick feed | | Power consumption | | Specific cutting force | |
| | *ap* | mm | *ae* | mm | *Pf* | mm | *Pc* | kW | *kc* | MPa |
| | Chip removal rate | | Number of revolutions | | | | | | | |
| | *Q* | $cm^3/min$ | *n* | $min^{-1}$ | | | | | | |
| Drilling | Cutting speed | | Feed speed | | Feed | | Tool diameter | | Power consumption | |
| | *Vc* | m/min | *Vf* | mm/min | *f* | mm/rev | *øDc* | mm | *Pc* | kW |
| | Torque | | Thrust force | | Specific cutting force | | Drilling depth | | Number of revolutions | |
| | *Mc* | N·m | *Tc* | N | *Kc* | MPa | *H* | mm | *n* | $min^{-1}$ |

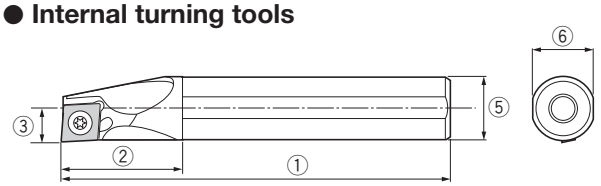
## Dimensional symbols of turning tools

### ● External turning tools



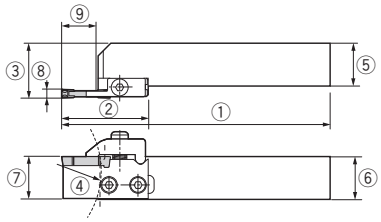

| ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
|---|---|---|---|---|---|---|
| Overall length | Head length | Distance to cutting edge | Distance to cutting edge | Shank width | Shank height | Cutting edge height |
| $L_1$ | $L_2$ | *f* | $f_1$ | *b* | *h* | $h_1$ |

### ● Internal turning tools




| ① | ② | ③ | ④ | ⑤ | ⑥ |
|---|---|---|---|---|---|
| Overall length | Head length | Distance to cutting edge | Minimum bore diameter | Shank diameter | Shank height |
| $L_1$ | $L_2$ | *f* | *øDm* | *øDs* | *h* |

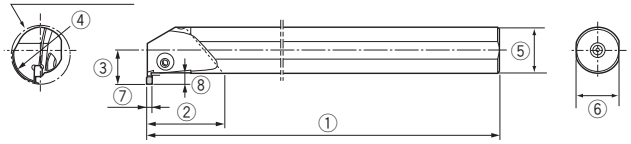
### ● External and face grooving tools




| ① | ② | ③ | ④ | ⑤ |
|---|---|---|---|---|
| Overall length | Head length | Distance to cutting edge | Maximum grooving diameter | Shank width |
| $L_1$ | $L_2$ | *f* | *øDm* | *b* |
| ⑥ | ⑦ | ⑧ | ⑨ | |
| Shank height | Cutting edge height | Cutting edge width | Maximum grooving depth | |
| *h* | $h_1$ | *w* | *ar* | |

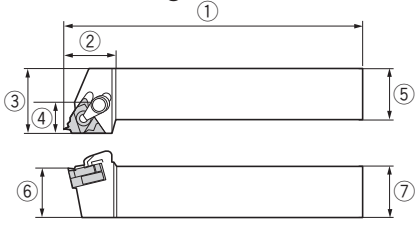
### ● Internal grooving tools

Min. bore diameter *øDm*



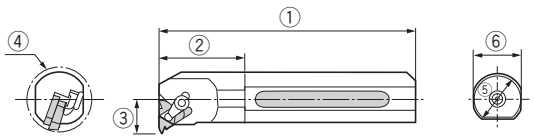

| ① | ② | ③ | ④ |
|---|---|---|---|
| Overall length | Head length | Distance to cutting edge | Maximum grooving diameter |
| $L_1$ | $L_2$ | *f* | *øDm* |
| ⑤ | ⑥ | ⑦ | ⑧ |
| Shank diameter | Shank height | Cutting edge width | Maximum grooving depth |
| *øDs* | *h* | *w* | *ar* |

### ● External threading tools




| ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
|---|---|---|---|---|---|---|
| Overall length | Head length | Distance to cutting edge | Shoulder width | Shank width | Shank height | Cutting edge height |
| $L_1$ | $L_2$ | *f* | - | *b* | *h* | $h_1$ |

### ● Internal threading tools



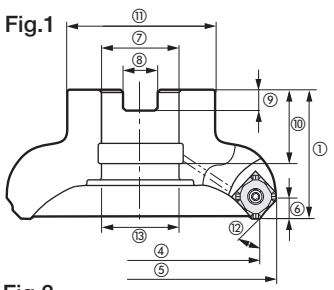

| ① | ② | ③ | ④ | ⑤ | ⑥ |
|---|---|---|---|---|---|
| Overall length | Head length | Distance to cutting edge | Maximum grooving diameter | Shank diameter | Shank height |
| $L_1$ | $L_2$ | *f* | *øDm* | *øDs* | *h* |

## Dimensional symbols of milling tools

### ● Bore type milling tools

Square shoulder cutter

Fig.1



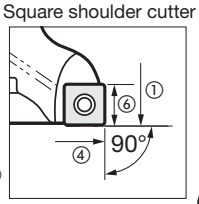



Fig.2

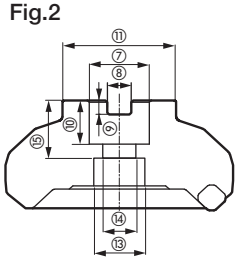


Fig.3

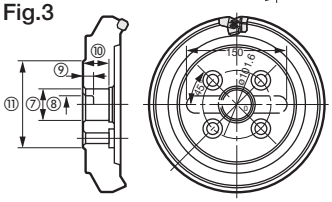
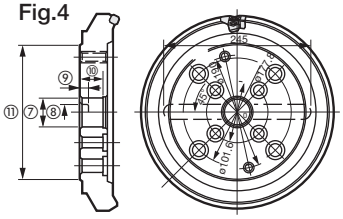
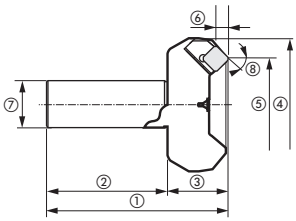


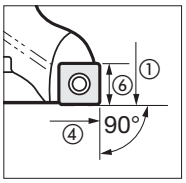
Fig.4



### ● Shank type milling tools



Square shoulder cutter

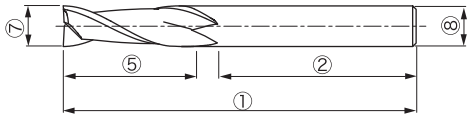



| ① | ② | ③ | ④ |
|---|---|---|---|
| Overall length | Shank length | Cutter height | Cutter diameter |
| $L$ | $\ell_s$ | $L_f$ | $\varnothing D_c$ |
| ⑤ | ⑥ | ⑦ | ⑧ |
| Maximum outer diameter | Maximum depth of cut | Shank diameter | Corner angle |
| $\varnothing D_1$ | ap | $\varnothing D_s$ | $\kappa$ |

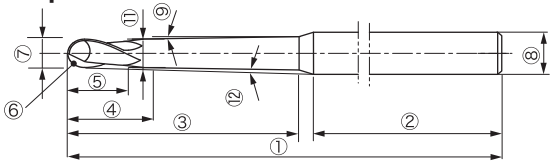
| ① | ④ | ⑤ | ⑥ | ⑦ | ⑧ | ⑨ | ⑩ | ⑪ | ⑫ | ⑬ | ⑭ | ⑮ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cutter height | Cutter diameter | Maximum outer diameter | Maximum depth of cut | Hole diameter | Key way width | Key way depth | Mounting hole depth | Mounting flat diameter | Corner angle | Mounting bolt counter bore dia. | Mounting bolt hole diameter | Mounting bolt hole depth |
| $L_f$ | $\varnothing D_c$ | $\varnothing D_1$ | ap | $d$ | $a$ | $b$ | $\ell$ | $\varnothing D_b$ | $\kappa$ | $\varnothing d_1$ | $\varnothing d_2$ | $\ell_1$ |

## Dimensional symbols of endmills

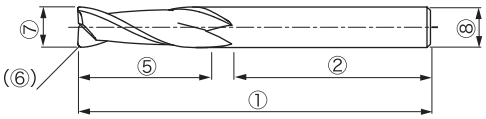
### ● Square endmills



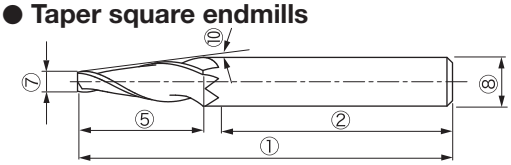
### ●Taper-neck ball endmills



### ● Radius endmills

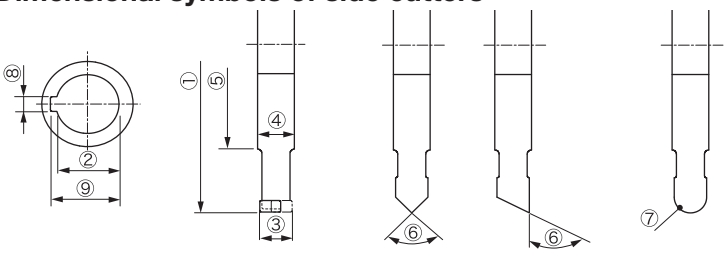


### ● Taper square endmills



| ① | ② | ③ | ④ | ⑤ | ⑥ Ball end | ⑥ Radius end | ⑦ | ⑧ | ⑨ | ⑩ | ⑪ | ⑫ | ⑬ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Overall length | Shank length | Neck length | Length of parallel portion | Cutting edge length | Ball radius | Corner radius | Tool diameter | Shank diameter | Half angle of neck taper | Half angle of cutting edge taper | Neck diameter | Inter-ference angle | Helix angle |
| $L$ | $\ell_s$ | $\ell_2$ | $\ell_1$ | $\ell$ | $R$ | $r$ | $\varnothing D_c$ | $\varnothing D_s$ | $\theta_n$ | $\theta_c$ | $\varnothing D_1$ | $\theta\kappa$ | $\lambda$ |

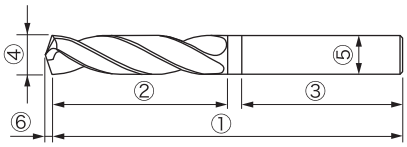
## Dimensional symbols of side cutters



| ① | ② | ③ | ④ | ⑤ |
|---|---|---|---|---|
| Cutter diameter | Bore diameter | Cutting edge width | Boss thickness | Boss diameter |
| $\varnothing D_c$ | $\varnothing d$ | $\ell$ | $T$ | $\varnothing D_b$ |
| ⑥ | ⑦ | ⑧ | ⑨ | ⑩ |
| Cutting edge angle | Corner radius | Key way width | Key way depth | Number of teeth |
| $\alpha$ | $R$ | $a$ | $b$ | $z$ |

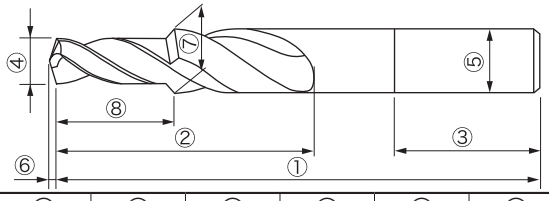
## Dimensional symbols of drills

### ● Solid straight drills



| ① | ② | ③ | ④ | ⑤ | ⑥ |
|---|---|---|---|---|---|
| Overall length | Flute length | Shank length | Drill diameter | Shank diameter | Point length |
| $L$ | $\ell$ | $\ell_s$ | $\varnothing D_c$ | $\varnothing D_s$ | $L_p$ |

### ● Solid step drills



| ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ | ⑧ |
|---|---|---|---|---|---|---|---|
| Overall length | Flute length | Shank length | First step drill diameter | Shank diameter | Point length | Second step drill diameter | Step length |
| $L$ | $\ell$ | $\ell_s$ | $\varnothing D_c$ | $\varnothing D_s$ | $L_p$ | $\varnothing D_{c2}$ | $\ell_1$ |

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