



*INNOVATOR IN
TECHNOLOGY*

PCD Tools · PCBN Tools · CVD/Mono Diamond Tools

DIAMOND TOOLS

EHWA

EHTWA



- 1975. Founded in Seoul, Korea
- 1981. Established subsidiary in California, USA
- 1985. Headquarters moved to Osan, Korea
- 1993. ISO9001 certified (TUV)
 - Established plant in Fujian, China
- 1995. Opened sales office in Nagoya, Japan
- 1997. Established plant in Weihai, China
- 2002. Established plant in Shanghai, China
 - Acquired revised ISO 9001 and ISO 14001
- 2003. oSa (Organization for the Safety of Abrasives) certified
- 2004. Opened sales office in Frankfurt, Germany
- 2005. Selected as "Certified excellent company of quality competitiveness" by the Korean government
- 2008. Awarded \$100M export Presidential award
- 2011. Selected as "World class 300 company" by the Korean government (First round)
- 2012. Established plant in Jakarta, Indonesia
- 2013. Opened new facility in Dongtan (R&D center and new business development)
 - Opened sales subsidiary in India
- 2015. Opened sales subsidiary in Mexico



TUV



Worldwide competence -

The most advanced technology for diamond tools and quality

EHWA has become an international benchmark for success because of our ability to adapt quickly to the changing markets and diverse needs of customers, and by leading the way in applying the most advanced technology for manufacturing industrial diamond tools.

Since 1975, EHWA has been able to greatly expand its market share throughout the world because we have established a world renowned reputation of high quality products, service and expertise in the industry. EHWA is deeply committed to keeping customers up-to-date and equipped with the most competitive products and technical information. Our success can only be measured by the success of our customers.

The key to our flexibility and strength in the global marketplace is our many alliances with reliable overseas partners and customers throughout the world. EHWA purchases only the highest quality raw materials, industrial diamonds and CBN from reputable sources. In addition to having strong supply lines with major suppliers, EHWA has successfully teamed up with high-tech manufacturers in Europe, Japan, and U.S. under several joint-ventures for the research and development of high precision diamond tools, rotary dressers, and precision electroplated diamond tools.

The success of a company depends on its ability to adapt and compete in the global marketplace. EHWA is able to survive in the age of globalization because we are already globalized.

EHWA diamond tools are your partner for success.



EHWA = Cooperation

'E(二)' means Two Parties: EHWA and People such as customers, employees, partners and our society. 'HWA(和)' means Cooperation. Our philosophy is to nurture and grow long-term partnerships with our customers. Ever since 1975 when EHWA was established, EHWA has been striving to develop into the very best in our industry not only in size but more importantly in quality. We are convinced that we are the best partner for you.

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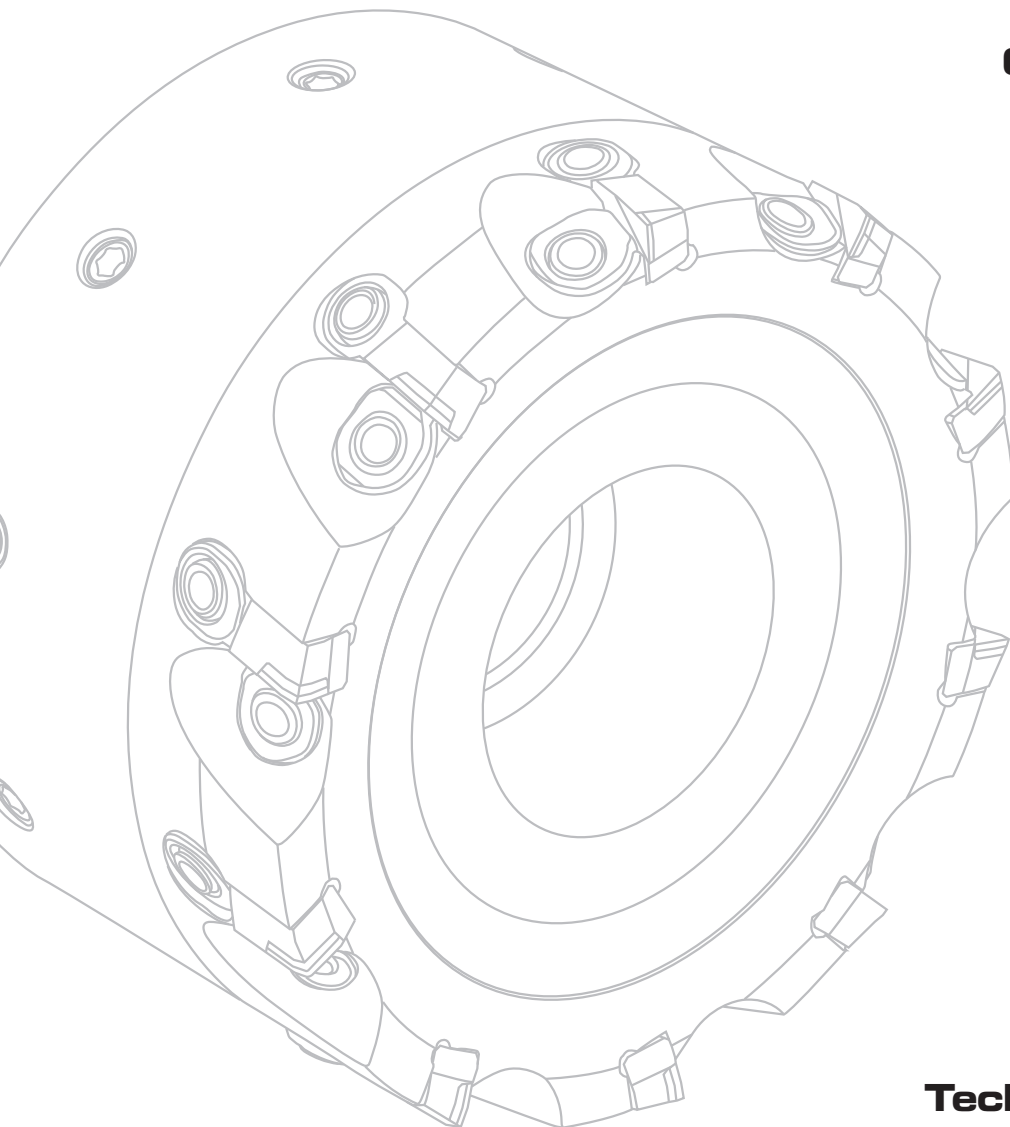
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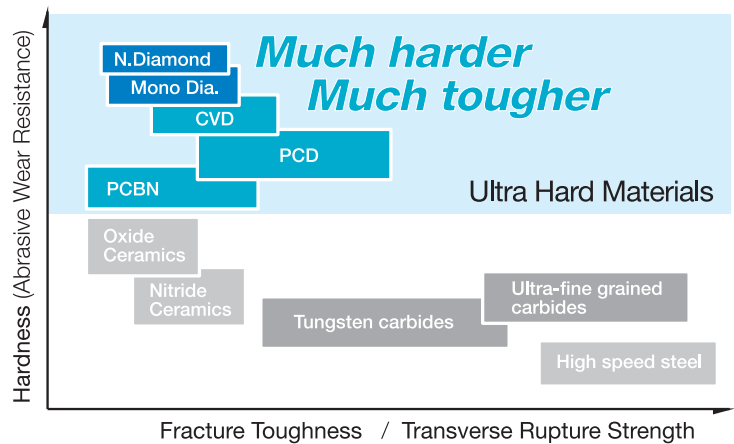


Diamond tools advantage



Today's modern industrial society continues to push the development and uses of new and advanced materials, and high precision machining to new heights. Along with the improvements in producing processes and difficulties that arise from machining new and advanced materials, there is an increasing demand for new forms of cutting tools that go beyond the conventional cutting tools such as those made out of high speed steel, tungsten carbides, cermets, and ceramics.

Polycrystalline Diamond (PCD), is a synthetic diamond product that is produced by sintering selected diamond particles with a metal matrix using very sophisticated temperature and high pressure technology.



Characteristics of diamond types

| | PCD | PCBN | CVD diamond | Mono diamond Natural diamond |
|--------------------------|---|--|---|--|
| Definition | Polycrystalline diamond | Polycrystalline cubic boron nitride | Polycrystalline diamond (Chemical vapor deposition method) | Single crystal diamond |
| Applicable work material | Non-ferrous such as Al, Copper alloys, etc. & non-metallic such as wood working, advanced composite, etc. | Ferrous material such as cast iron, hardened steel, super alloy material, etc. | Non-ferrous such as Al, Copper alloys, etc. & non-metallic such as wood working, advanced composite, etc. | Superior edge quality for nonmetallic material |
| Hardness (Hv, GPa) | 50 ~ 70 | 30 ~ 40 | 70 ~ 80 | 80 ~ 100 |
| Magnified Structure | | | | |

The PCD is by its nature, high in uniform hardness, and also more abrasive and shock resistant in all directions than natural diamonds because of its random-oriented structure of the diamond particles.

Polycrystalline Cubic Boron Nitride (PCBN) is an artificially synthesized material, its hardness is exceeded only by the diamond. However, unlike diamond, PCBN is stable under conditions of high temperature (up to 1000°C), normally seen when machining hardened ferrous or super alloy materials. PCBN tools permit metal cutting by feed and speed that are much higher than conventional cutting tools.

Diamond tools advantages

- Good surface finish
 - High accuracy
 - Longer tool life
- Lower stock management
- Fast material removal rate
 - Lower energy cost
 - Eco friendly



PolyCrystalline Diamond

PCD distinction & application

| Grit size | Ultra Fine | Fine | Medium | Coarse | Multi modal |
|--------------------------|---------------------------------|----------------|----------------|----------------|----------------|
| Micro structure (1000 x) | | | | | |
| Type | Carbide backed | Carbide backed | Carbide backed | Carbide backed | Carbide backed |
| Grain size | 0.5 μm | 4 μm | 10 μm | 25 μm | 30+2 μm |
| Diamond (%) | 85~90 | 90 | 90 | 90 | 94 |
| Grade | EP20 | EP51 | EP55 | EP58 | EP29 |
| Surface finish | Better | → → | → → | → → | → → |
| Wear resistance | Worse | → → | → → | → → | → → |
| Application | Wood working | | | | |
| | Copper alloy | | | | |
| | Rubber / Acryl_glass | | | | |
| | (Si <13%) Al-Si alloy (Si >13%) | | | | |
| | Tungsten carbide | | | | |
| | Ceramic (sintered/unsintered) | | | | |
| | M.M.C / CFRP / Glass fiber | | | | |
| General purpose | | | | | |

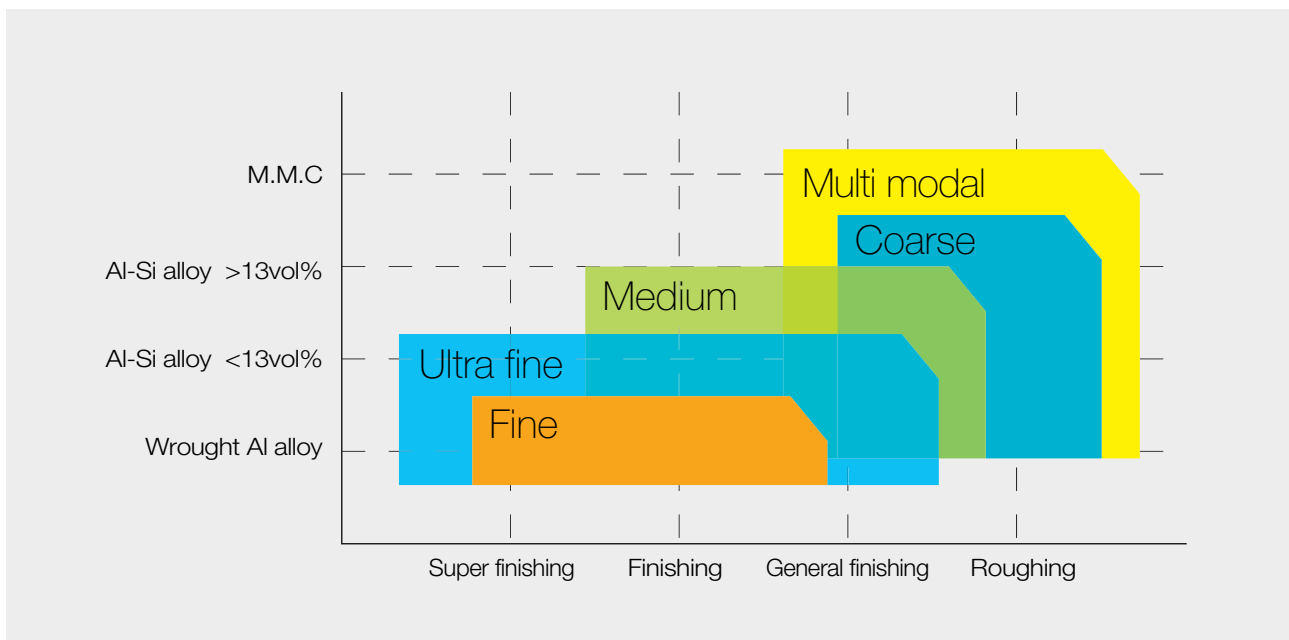
EHWA PCD grade

| Grade | Binder | Diamond vol. (%) | Grit size (μm) | Characteristic |
|-------|--------|------------------|----------------|--|
| EP10 | W+Co | 85 | 1.5 | Excellent sharp edge, Superb sharpness cutting edge |
| EP20 | W+Co | 85 | 0.5 | Excellent surface finish, Ultra fine grade and fine grade |
| EP51 | W+Co | 90 | 2~3 | Excellent surface finish |
| EP13 | W+Co | 92 | 5~6 | General purpose, Excellent WEDM |
| EP55 | W+Co | 90 | 10 | General purpose |
| EP75 | W+Co | 90 | 8 | General purpose, Excellent WEDM |
| EP750 | W+Co | 90 | 10+2 | Multi-modal, Good wear resistance |
| EP58 | W+Co | 94 | 25 | Excellent wear resistance |
| EP59 | W+Co | 95 | 25+2 | Multi-modal, Good wear resistance |
| EP29 | W+Co | 94 | 30+2 | Multi-modal, Good wear resistance, Adequate for difficult-to-cut-materials |

EHWA PCD Working parameter

| Materials | Ultra Fine | Fine | Medium | Coarse | Multi modal | Vc (m/min) | f (mm/rev) | ap (μm) |
|---------------------|------------|------|-------------------|--------|-------------|------------|------------|---------|
| Al (Si <13%) | EP10, EP20 | | EP13, EP55, EP75 | | | ~ 3,000 | ~ 0.2 | ~ 3 |
| Al (Si >13%) | | | EP750 | EP58 | EP29, EP59 | ~ 3,000 | ~ 0.2 | ~ 3 |
| Copper alloy | EP10, EP20 | EP51 | EP13 | | | ~ 1,000 | ~ 0.2 | ~ 3 |
| TC / Ceramic | | | EP55, EP75, EP750 | EP58 | EP29, EP59 | 10~ 30 | ~ 0.2 | ~ 0.5 |
| Engineering plastic | EP10, EP20 | | EP13, EP55, EP75 | | EP29, EP59 | ~ 1,000 | ~ 0.4 | ~ 2 |
| Wood | | EP51 | EP55, EP75, EP750 | | | ~ 4,000 | ~ 0.4 | - |
| Ti alloy | EP20 | | | | | 50~ 100 | ~ 0.3 | ~ 0.5 |

Application severity by PCD grade



Applicable work material

| Nonferrous material | Nonmetallic material |
|--|--|
| AL alloys High Si >13% / Low-medium Si <13% / Metal matrix composites | Wood working High density fiberboard / Chipboard / Hardboard / Laminates |
| Copper alloys Brass / Bronze / Zinc | Advanced composite Graphite-epoxy / Carbon-fiber / Fiberglass plastic / Engineering plastic |
| Tungsten carbide Sintered / Unsintered | Ceramic & Stone Sintered / Unsintered / Granite / Imitation marble |
| Ti alloy | Quartz |

Polycrystalline Cubic Boron Nitride

PCBN distinction


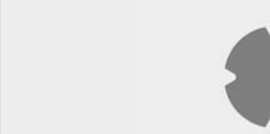
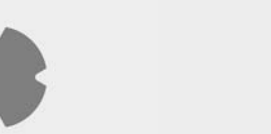
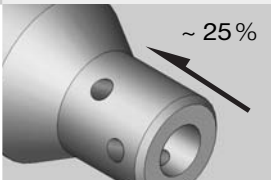

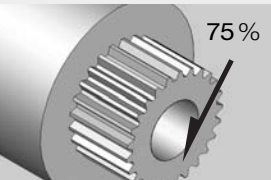
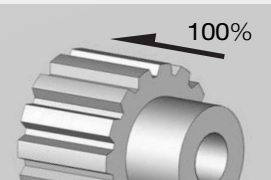
| Contents | CBN vol. (%) | Grit size (μm) | Binder phase | Strength & toughness | Thermal conductivity | Chemical stability | Wear resistance |
|---------------|--------------|----------------|-----------------------|----------------------|----------------------|--------------------|-----------------|
| Low contents | 40 ~ 70 | 0.5 ~ 5 | Ceramics (TiC, TiN..) | ■ ■ □ □ | ■ ■ □ □ | ■ ■ ■ ■ | ■ ■ ■ □ |
| High contents | 70 ~ 95 | 20 ~ 10 | Metal (Co, WC...) | ■ ■ ■ ■ | ■ ■ ■ ■ | ■ ■ □ □ | ■ ■ ■ ■ |

EHWA PCBN grade

| Grade | CBN vol% | Grit size (μm) | Type | Application | |
|---------------|--------------|----------------|----------------|----------------------------|---------------------------------|
| Low contents | EB28X, EB28S | 50 | 2 | Carbide Backed, Solid | H05~H15, P/M(high alloyed) |
| | EB580, EB58S | 55 | 1~2 | Carbide Backed, Solid | H05 |
| | EB570, EB57S | 60 | 1~2 | Carbide Backed, Solid | H05~H15 |
| | EB29X, EB29S | 45 | 0.5~1 | Carbide Backed, Solid | H15~H25,P/M(high alloyed) |
| | EB160 | 60 | 2~3 | Carbide Backed, Solid | H05~H15 |
| | EB550, EB55S | 65 | 2 | Carbide Backed, Solid | H15~H25,P/M(high alloyed) |
| | EB150 | 60 | 1~2 | Carbide Backed | H15~H25 |
| | EB290 | 65 | 4~5 | Carbide Backed | H25~H35 |
| EB170 | 70 | 3~4 | Carbide Backed | Powder metal(high alloyed) | |
| High contents | EB51 | 95 | 2 | Carbide Backed | Cast iron(Standard) |
| | EB120 | 85 | 1~3 | Carbide Backed | Ductile cast iron, chilled iron |
| | EB210 | 90 | 3~4 | Carbide Backed | Cast iron(high interrupt) |
| | EB710 | 85 | 1~2 | Carbide Backed | Chilled iron, p/m(low alloyed) |
| | EB10X | 85 | 10+2 | Solid | Cast iron(rough,interrupt) |
| | EB100X | 85 | 10+2 | Solid | White iron |
| | EB50 | 90 | 15 | Solid | Grey Cast iron(rough) |

H05 : Continuous / H15 : Light Interruption / H25 : Medium Interruption / H35 : Heavy Interruption

Interruption of hard steel turning

| | Light (H15) | Medium (H25) | Heavy (H35) | |
|------------------------|---|---|--|--|
| Stress at cutting edge |  |  |  | |
| Ratio of interruption |  ~ 25% |  50% |  75% |  100% |

EHWA PCBN Working parameter

| | Continuous cutting | Interrupt cutting | | | Working parameter | | |
|---|---------------------|-------------------|--------|--------------|-------------------|------------|-----------|
| | | Light | Medium | Heavy | Vc(m/min) | f (mm/rev) | ap (mm) |
| H Hardened steel | EB28X, EB28S | | | | 120-280 | 0.05~0.2 | 0.05~0.3 |
| | EB580, EB58S | | | | 120~300 | 0.05~0.2 | 0.05~0.3 |
| | EB570, EB57S | | | | 100~230 | 0.05~0.15 | 0.05~0.2 |
| | EB29X, EB29S | | | | 80~200 | 0.05~0.25 | 0.05~0.2 |
| | EB160 | | | | 80~180 | 0.05~0.25 | 0.05~0.3 |
| | EB150, EB550, EB55S | | | | 50~170 | 0.05~0.2 | 0.05~0.3 |
| | EB290 | | | | 50~150 | 0.05~0.2 | 0.05~0.2 |
| K Cast iron | | | | EB210 | 50~100 | 0.05~0.2 | 0.05~0.25 |
| | | | EB51 | | 300~1500 | 0.1~0.5 | 0.1~1 |
| | | | EB210 | | 300~1500 | 0.1~0.3 | 0.1~1 |
| | | | EB50 | | 150~1500 | 0.1~0.5 | 0.1~4 |
| | | | EB10X | | 150~1000 | 0.1~0.3 | 0.1~4 |
| Powder metal High alloyed Low alloyed | | | | EB100X | 150~1000 | 0.1~0.3 | 0.1~4 |
| | | | | EB28X, EB28S | 100~250 | 0.05~0.2 | 0.05~0.2 |
| | | | | EB29X, EB29S | 50~150 | 0.05~0.25 | 0.05~0.2 |
| | | | | EB170 | 100~200 | 0.05~0.2 | 0.05~0.2 |
| | | | | EB550, EB55S | 50~150 | 0.05~0.25 | 0.05~0.2 |
| | | | | EB51 | 50~150 | 0.05~0.3 | 0.05~0.2 |
| | | | EB710 | 50~150 | 0.05~0.3 | 0.05~0.2 | |
| | | | EB120 | 50~150 | 0.05~0.3 | 0.05~0.2 | |

Applicable work material

Low contents

Hardened steel

Tool steel / Die steel / Hardened steel / Bearing steel / Hi-Cr, Mo steel

Work example

Gear / Transmission / Shaft / Bearing / Die / Punch

Powder metal

Sintered metal

Work example Valve seat / Valve guide / Con-rod / Oil-pump / Gear

High contents

Cast iron

Gray cast iron / Ni-Hard cast iron / Alloy cast iron / Chilled cast iron / Nodular cast iron

Work example Engine block / Brake disc / Brake drum / Clutch plate / Roll / Pump / Impeller

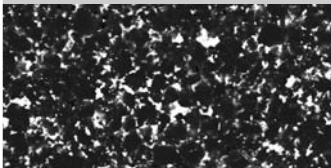
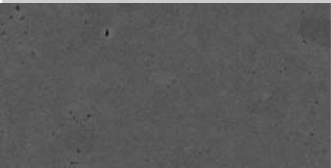
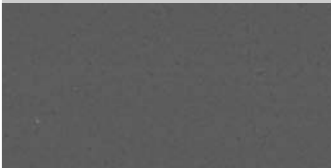
Super alloy

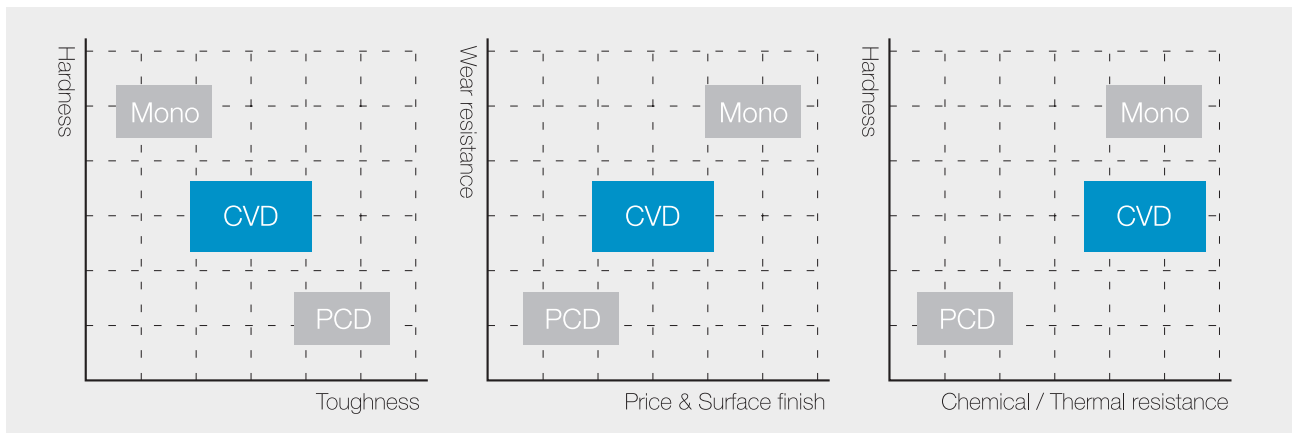
Inconel 718,901,600 / Rene76,77,95 / Stellite

Work example Turbine / Turbine disc / Turbine blade / Turbine vane

Chemical Vapoured Deposition diamond

General properties of CVD diamond

| Property | PCD | CVD (Poly crystal diamond) | Mono (Single crystal diamond) |
|-----------------------------------|---|--|---|
| Thermal conductivity | 560 | ~1,000 | 2,000 |
| Hardness (Gpa) | 50 ~ 70 | 70 ~ 80 | 80 ~ 100 |
| Toughness (Mpa-m ^{1/2}) | 8~9 | 5~6 | 3.4 |
| Tensile strength (Gpa) | 1,260 | 400~800 | 2,000 |
| Micro structure (1000 x) |  |  |  |



EHWA CVD diamond grade

| Grade | ED20 | ED501 | ED502 |
|-----------------|---------|---------|---------|
| Wear resistance | ■ ■ □ □ | ■ ■ ■ □ | ■ ■ ■ ■ |
| Toughness | ■ ■ ■ ■ | ■ ■ ■ □ | ■ ■ □ □ |

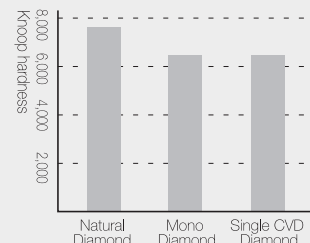
Applicable work material

| Nonferrous material | Nonmetallic material |
|--|--|
| AL alloys High Si >13% / Low-medium Si <13% / Metal matrix composites | Wood working High density fiberboard / Chipboard / Hardboard / Laminates |
| Copper alloys Brass / Bronze / Zinc | Advanced composite Graphite-epoxy / Carbon-fiber / Fiberglass plastic / Engineering plastic |
| Tungsten carbide Sintered / Unsintered | Ceramic & Stone Sintered / Unsintered / Granite / Imitation marble |
| | Quartz |

Single Crystal Diamond

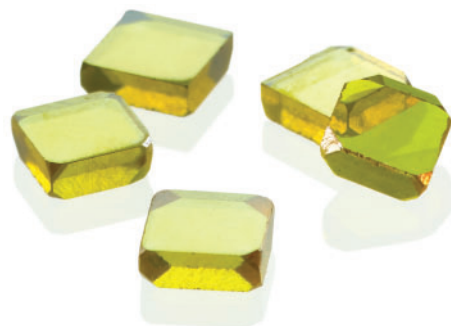
Application

- Non-ferrous metal
- Acrylic
- Lens
- Microscopic pattern
- FPD (Flat Panel Display)
- BLU (Back Light Unit)



Natural Diamond

- Excellent surface finish
- Colorless
- Longest tool life, Excellent wear resistance
- Highest thermal conductivity



Mono Diamond

- Available alternative to natural diamond
- Yellow color
- High pressure, High temperature synthesis
- Enhanced and more consistent performance

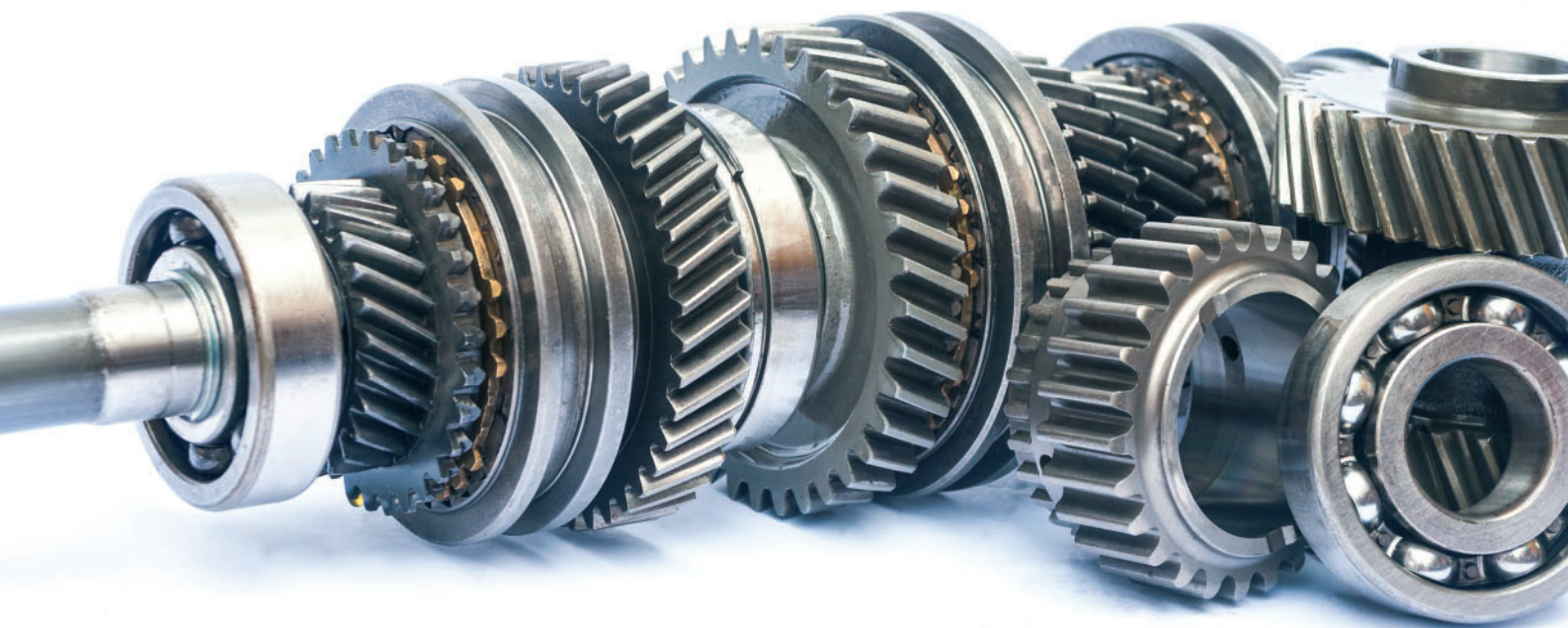


Single CVD Diamond

- Similar to natural diamond
- Colorless
- Superior edge quality for ultra precision machining applications
- Highly consistent material properties

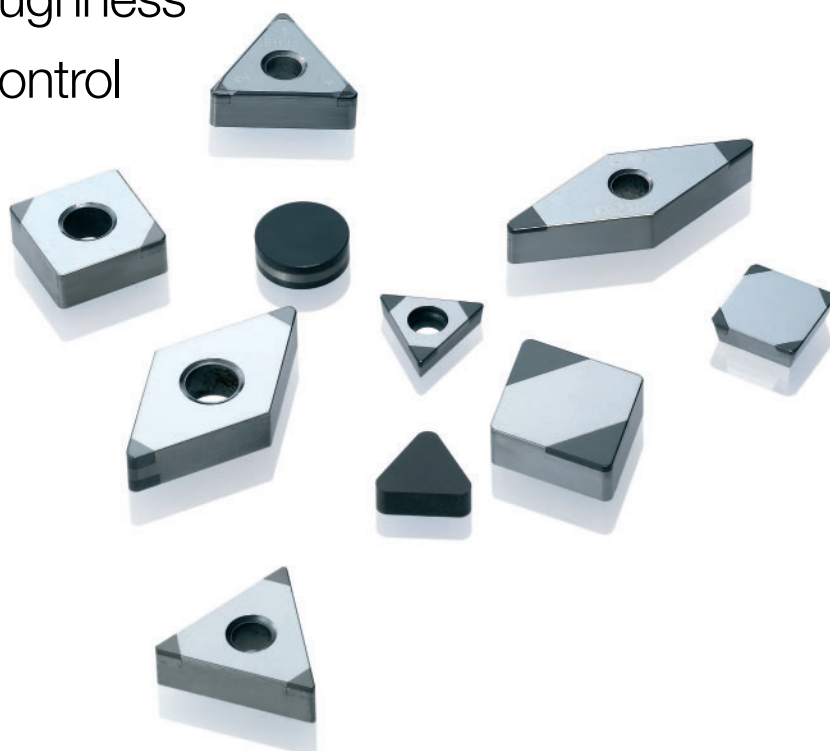
Turning





EHWA offers a wide range of PCD & PCBN inserts for turning.
Customers looking for high productivity can count on EHWA's turning tools.
Here is right choice for an excellent and economical solution.

- _ Maximum metal removal & Higher productivity
- _ Strong resistance & Longer tool life
- _ Superior surface roughness
- _ Precise tolerance control

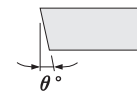


Designation system

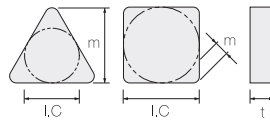


Insert shape Clearance angle Tolerances Clamp type

| Symbol | Shape |
|--------|-------|
| C | |
| D | |
| E | |
| K | |
| R | |
| S | |
| T | |
| V | |
| W | |



| Symbol | Angle |
|--------|-------|
| N | 0° |
| A | 3° |
| B | 5° |
| C | 7° |
| P | 11° |
| D | 15° |
| E | 20° |
| F | 25° |



| Class | I.C size (mm) | Tolerance | | |
|-------|---------------|-----------|--------|----------|
| | | m (mm) | t (mm) | I.C (mm) |
| A | 6.35 | ±0.005 | ±0.025 | ±0.025 |
| F | 9.52 | ±0.005 | ±0.025 | ±0.013 |
| C | 12.7 | ±0.013 | ±0.025 | ±0.025 |
| | 15.88 | ±0.013 | ±0.025 | ±0.013 |
| | 19.05 | ±0.013 | ±0.025 | ±0.013 |
| E | 25.4 | ±0.025 | ±0.025 | ±0.025 |
| G | 31.75 | ±0.025 | ±0.13 | ±0.025 |
| M | 6.35 | ±0.08 | ±0.13 | ±0.05 |
| | 9.52 | ±0.08 | ±0.13 | ±0.05 |
| | 12.7 | ±0.13 | ±0.13 | ±0.08 |
| | 15.88 | ±0.15 | ±0.13 | ±0.1 |
| | 19.05 | ±0.15 | ±0.13 | ±0.1 |
| | 25.4 | ±0.18 | ±0.13 | ±0.13 |
| U | 31.75 | ±0.18 | ±0.13 | ±0.13 |
| | 6.35 | ±0.13 | ±0.13 | ±0.08 |
| | 9.52 | ±0.13 | ±0.13 | ±0.08 |
| | 12.7 | ±0.2 | ±0.13 | ±0.13 |
| | 15.88 | ±0.27 | ±0.13 | ±0.13 |
| | 19.05 | ±0.27 | ±0.13 | ±0.18 |
| | 25.4 | ±0.38 | ±0.13 | ±0.25 |
| | 31.75 | ±0.38 | ±0.13 | ±0.25 |

| Symbol | Shape |
|--------|---------|
| A | |
| G | |
| M | |
| R | |
| B, W | |
| T, H | |
| N | |
| Z, X | Special |

12

04

08

T2501

(R)

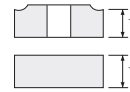
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2

Cutting edge length

| C | D | E | R | S | T | V | W | K | I.C size (mm) |
|----|----|----|------|----|----|----|----|----|---------------|
| 03 | 04 | | | 03 | 06 | | | | 3.97 |
| 05 | 06 | | | 05 | 09 | 09 | 03 | | 5.56 |
| 06 | 07 | | | 06 | 11 | 11 | 04 | | 6.35 |
| 08 | 09 | | | 07 | 13 | 13 | 05 | | 7.94 |
| | | | 08 | | | | | | 8 |
| 09 | 11 | | 09 | 09 | 16 | 16 | 06 | 16 | 9.52 |
| | | | 10 | | | | | | 10 |
| | | | 12 | | | | | | 12 |
| 12 | 15 | 13 | 12.7 | 12 | 22 | 22 | 08 | | 12.7 |
| 16 | 19 | | 15 | 15 | 27 | 27 | 10 | | 15.88 |
| | | | 16 | | | | | | 16 |
| 19 | 23 | | 19 | 19 | 33 | 33 | 13 | | 19.05 |
| | | | 20 | | | | | | 20 |
| | | | 25 | | | | | | 25 |
| 25 | 31 | | 25 | 25 | 44 | | | | 25.1 |
| | | | 32 | | | | | | 32 |

Thickness



| Symbol | t (mm) |
|--------|--------|
| 01 | 1.59 |
| T1 | 1.98 |
| 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 |

Corner radius



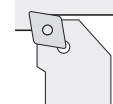
| Symbol | R (mm) |
|--------|--------|
| 01 | 0.1 |
| 02 | 0.2 |
| 04 | 0.4 |
| 05 | 0.5 |
| 08 | 0.8 |
| 12 | 1.2 |
| 16 | 1.6 |
| 20 | 2 |
| 24 | 2.4 |
| 32 | 3.2 |

1 Edge shape

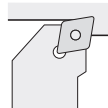
| Symbol | Shape |
|--------|-------|
| F | |
| E | |
| T | |
| S | |

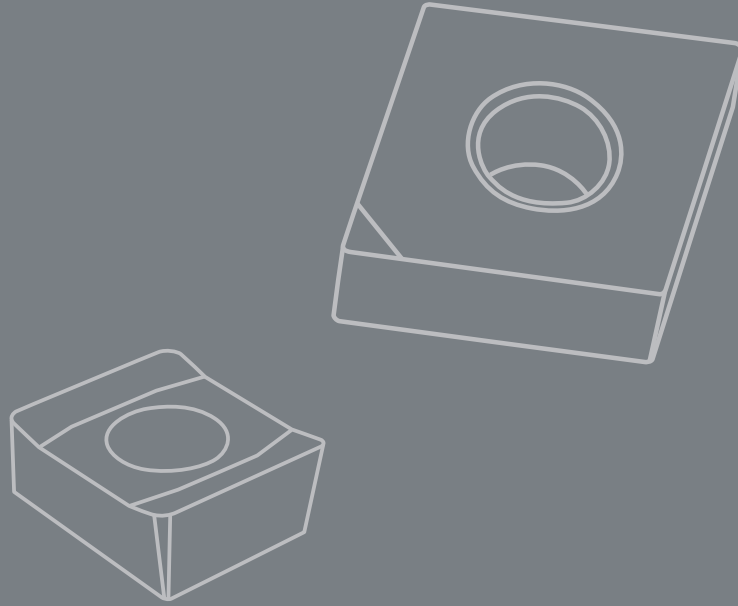
2 Hand of insert

R Right hand



L Left hand

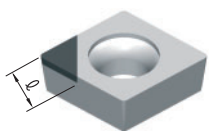




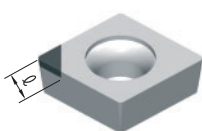
Turning_
PCD/CVD



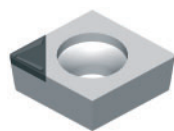
Insert tip types



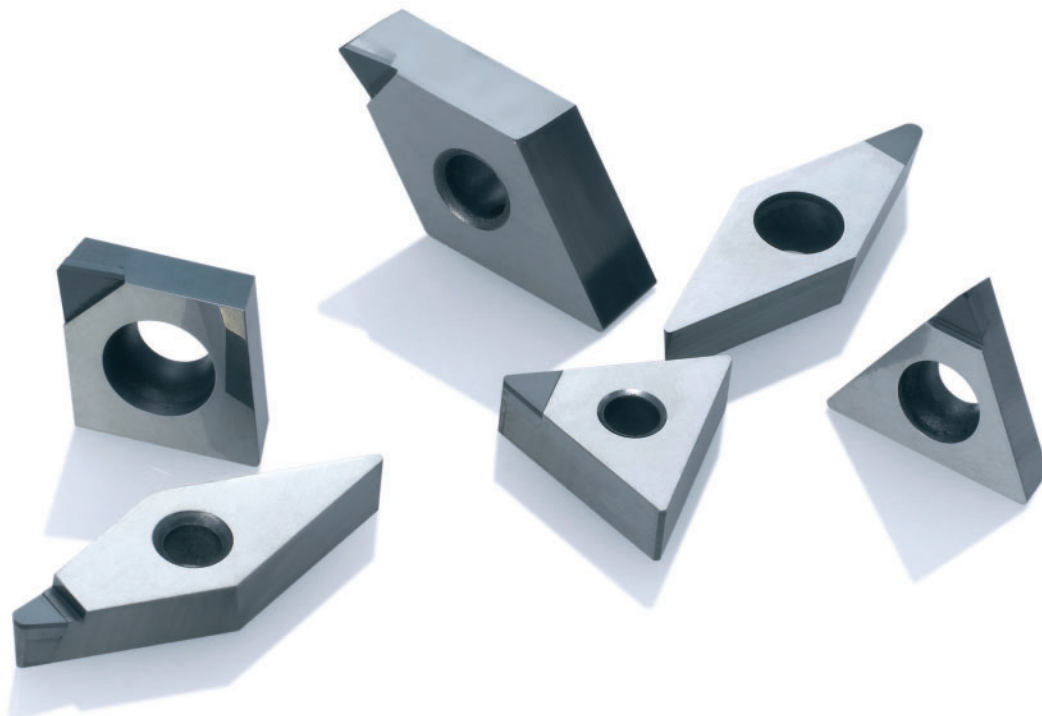
Standard



Mini tip



3D Chip breaker



CN □ □
NEGATIVE _ hole

| CNGA | | | ISO code | | Dimensions (mm) | | | | | PCD | | | | | | CVD | | | | | |
|-------------|----------|-------------|--------------|--------------|-----------------|------|------|------|------|------|------|------|------|-------|------|------|------|------|-------|-------|--|
| | | | Metric | Inch | I.C | T | R | Hole | φ | EP10 | EP20 | EP13 | EP55 | EP750 | EP58 | EP59 | EP29 | ED20 | ED501 | ED502 | |
| | Standard | CNGA 120402 | CNGA 43(0.5) | 12.7 | 4.76 | 0.2 | 5.16 | 4.3 | | | | | | | | | | | | | |
| | | | 120404 | 431 | 12.7 | 4.76 | 0.4 | 5.16 | 4.3 | | | | | | | | | | | | |
| | | | 120408 | 432 | 12.7 | 4.76 | 0.8 | 5.16 | 4.2 | | | | | | | | | | | | |
| | | | 120412 | 433 | 12.7 | 4.76 | 1.2 | 5.16 | 4.1 | | | | | | | | | | | | |
| | | MT | CNGA 120402 | CNGA 43(0.5) | 12.7 | 4.76 | 0.2 | 5.16 | 2.8 | | | | | | | | | | | | |
| | | | | 120404 | 431 | 12.7 | 4.76 | 0.4 | 5.16 | 2.8 | | | | | | | | | | | |
| | | | 120408 | 432 | 12.7 | 4.76 | 0.8 | 5.16 | 2.7 | | | | | | | | | | | | |
| | | | 120412 | 433 | 12.7 | 4.76 | 1.2 | 5.16 | 3.1 | | | | | | | | | | | | |

■ MT : Mini Tip

Holder : 53p, 57p, 60p, 61p

| CNGX | | | ISO code | | Dimensions (mm) | | | | | PCD | | | | | | CVD | | | | | |
|-------------|----------|-------------|--------------|--------------|-----------------|------|------|------|------|------|------|------|------|-------|------|------|------|------|-------|-------|--|
| | | | Metric | Inch | I.C | T | R | Hole | φ | EP10 | EP20 | EP13 | EP55 | EP750 | EP58 | EP59 | EP29 | ED20 | ED501 | ED502 | |
| | Standard | CNGX 120402 | CNGX 43(0.5) | 12.7 | 4.76 | 0.2 | 5.16 | 4.3 | | | | | | | | | | | | | |
| | | | 120404 | 431 | 12.7 | 4.76 | 0.4 | 5.16 | 4.3 | | | | | | | | | | | | |
| | | | 120408 | 432 | 12.7 | 4.76 | 0.8 | 5.16 | 4.2 | | | | | | | | | | | | |
| | | | 120412 | 433 | 12.7 | 4.76 | 1.2 | 5.16 | 4.1 | | | | | | | | | | | | |
| | | MT | CNGX 120402 | CNGX 43(0.5) | 12.7 | 4.76 | 0.2 | 5.16 | 2.8 | | | | | | | | | | | | |
| | | | | 120404 | 431 | 12.7 | 4.76 | 0.4 | 5.16 | 2.8 | | | | | | | | | | | |
| | | | 120408 | 432 | 12.7 | 4.76 | 0.8 | 5.16 | 2.7 | | | | | | | | | | | | |
| | | | 120412 | 433 | 12.7 | 4.76 | 1.2 | 5.16 | 3.1 | | | | | | | | | | | | |

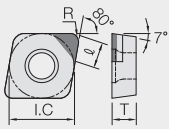
■ MT : Mini Tip

Holder : 53p, 57p, 60p, 61p

CC POSITIVE 7° hole

Turning

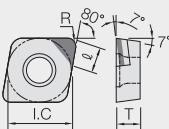
| CCGW | | ISO code | | Dimensions (mm) | | | | | PCD | | | | | | | CVD | | | |
|--------------|-------------|----------|-----------|-----------------|------|-----|------|-----|------|------|------|------|-------|------|------|------|------|-------|-------|
| | | Metric | Inch | I.C | T | R | Hole | φ | EP10 | EP20 | EP13 | EP65 | EP750 | EP68 | EP69 | EP29 | ED20 | ED501 | ED502 |
| Standard | CCGW 09T302 | CCGW | 3(2.5)0.5 | 9.525 | 3.97 | 0.2 | 4.4 | 4.3 | | | | | | | | | | | |
| | 09T304 | | 3(2.5)1 | 9.525 | 3.97 | 0.4 | 4.4 | 4.3 | | | | | | | | | | | |
| | 09T308 | | 3(2.5)2 | 9.525 | 3.97 | 0.8 | 4.4 | 4.2 | | | | | | | | | | | |
| | 120402 | | 430 | 12.7 | 4.76 | 0.2 | 5.5 | 4.3 | | | | | | | | | | | |
| | 120404 | | 431 | 12.7 | 4.76 | 0.4 | 5.5 | 4.3 | | | | | | | | | | | |
| | 120408 | | 432 | 12.7 | 4.76 | 0.8 | 5.5 | 4.2 | | | | | | | | | | | |
| MT | CCGW 060202 | CCGW | 2(1.5)0.5 | 6.35 | 2.38 | 0.2 | 2.8 | 2.8 | | | | | | | | | | | |
| | 060204 | | 2(1.5)1 | 6.35 | 2.38 | 0.4 | 2.8 | 2.8 | | | | | | | | | | | |
| | 060208 | | 2(1.5)2 | 6.35 | 2.38 | 0.8 | 2.8 | 2.7 | | | | | | | | | | | |
| | 09T302 | | 3(2.5)0.5 | 9.525 | 3.97 | 0.2 | 4.4 | 2.8 | | | | | | | | | | | |
| | 09T304 | | 3(2.5)1 | 9.525 | 3.97 | 0.4 | 4.4 | 2.8 | | | | | | | | | | | |
| | 09T308 | | 3(2.5)2 | 9.525 | 3.97 | 0.8 | 4.4 | 2.7 | | | | | | | | | | | |
| Chip breaker | 120402 | | 430 | 12.7 | 4.76 | 0.2 | 5.5 | 2.8 | | | | | | | | | | | |
| | 120404 | | 431 | 12.7 | 4.76 | 0.4 | 5.5 | 2.8 | | | | | | | | | | | |
| | 120408 | | 432 | 12.7 | 4.76 | 0.8 | 5.5 | 2.7 | | | | | | | | | | | |
| | 120412 | | 433 | 12.7 | 4.76 | 1.2 | 5.5 | 3.1 | | | | | | | | | | | |
| | CCGW 060202 | CCGW | 2(1.5)0.5 | 6.35 | 2.38 | 0.2 | 2.8 | 3.3 | | | | | | | | | | | |
| | 060204 | | 2(1.5)1 | 6.35 | 2.38 | 0.4 | 2.8 | 3.3 | | | | | | | | | | | |
| Chip breaker | 060208 | | 2(1.5)2 | 6.35 | 2.38 | 0.8 | 2.8 | 3.2 | | | | | | | | | | | |
| | 09T302 | | 3(2.5)0.5 | 9.525 | 3.97 | 0.2 | 4.4 | 4.3 | | | | | | | | | | | |
| | 09T304 | | 3(2.5)1 | 9.525 | 3.97 | 0.4 | 4.4 | 4.3 | | | | | | | | | | | |
| | 09T308 | | 3(2.5)2 | 9.525 | 3.97 | 0.8 | 4.4 | 4.2 | | | | | | | | | | | |
| | 120402 | | 430 | 12.7 | 4.76 | 0.2 | 5.5 | 4.3 | | | | | | | | | | | |
| | 120404 | | 431 | 12.7 | 4.76 | 0.4 | 5.5 | 4.3 | | | | | | | | | | | |
| Chip breaker | 120408 | | 432 | 12.7 | 4.76 | 0.8 | 5.5 | 4.2 | | | | | | | | | | | |
| | 120412 | | 433 | 12.7 | 4.76 | 1.2 | 5.5 | 4.1 | | | | | | | | | | | |



■ MT : Mini Tip Chip breaker type : Rough / Finish / Semi Finish

Holder : 66p

| CCGT | | ISO code | | Dimensions (mm) | | | | | PCD | | | | | | | CVD | | | |
|--------------|-------------|----------|-----------|-----------------|------|-----|------|-----|------|------|------|------|-------|------|------|------|------|-------|-------|
| | | Metric | Inch | I.C | T | R | Hole | φ | EP10 | EP20 | EP13 | EP65 | EP750 | EP68 | EP69 | EP29 | ED20 | ED501 | ED502 |
| Standard | CCGT 09T302 | CCGT | 3(2.5)0.5 | 9.525 | 3.97 | 0.2 | 4.4 | 4.3 | | | | | | | | | | | |
| | 09T304 | | 3(2.5)1 | 9.525 | 3.97 | 0.4 | 4.4 | 4.3 | | | | | | | | | | | |
| | 09T308 | | 3(2.5)2 | 9.525 | 3.97 | 0.8 | 4.4 | 4.2 | | | | | | | | | | | |
| | 120402 | | 430 | 12.7 | 4.76 | 0.2 | 5.5 | 4.3 | | | | | | | | | | | |
| | 120404 | | 431 | 12.7 | 4.76 | 0.4 | 5.5 | 4.3 | | | | | | | | | | | |
| | 120408 | | 432 | 12.7 | 4.76 | 0.8 | 5.5 | 4.2 | | | | | | | | | | | |
| MT | CCGT 060202 | CCGT | 2(1.5)0.5 | 6.35 | 2.38 | 0.2 | 2.8 | 2.8 | | | | | | | | | | | |
| | 060204 | | 2(1.5)1 | 6.35 | 2.38 | 0.4 | 2.8 | 2.8 | | | | | | | | | | | |
| | 060208 | | 2(1.5)2 | 6.35 | 2.38 | 0.8 | 2.8 | 2.7 | | | | | | | | | | | |
| | 09T302 | | 3(2.5)0.5 | 9.525 | 3.97 | 0.2 | 4.4 | 2.8 | | | | | | | | | | | |
| | 09T304 | | 3(2.5)1 | 9.525 | 3.97 | 0.4 | 4.4 | 2.8 | | | | | | | | | | | |
| | 09T308 | | 3(2.5)2 | 9.525 | 3.97 | 0.8 | 4.4 | 2.7 | | | | | | | | | | | |
| Chip breaker | 120402 | | 430 | 12.7 | 4.76 | 0.2 | 5.5 | 2.8 | | | | | | | | | | | |
| | 120404 | | 431 | 12.7 | 4.76 | 0.4 | 5.5 | 2.8 | | | | | | | | | | | |
| | 120408 | | 432 | 12.7 | 4.76 | 0.8 | 5.5 | 2.7 | | | | | | | | | | | |
| | 120412 | | 433 | 12.7 | 4.76 | 1.2 | 5.5 | 3.1 | | | | | | | | | | | |

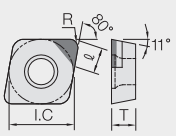


■ MT : Mini Tip

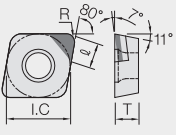
Holder : 66p

CP

POSITIVE 11 _ hole

| ISO code | | | Dimensions (mm) | | | | | | PCD | | | | | | | CVD | | | | | |
|---|--------------|-------------|-----------------|------------------|-----------|-------|------|------|------|------|------|------|-------|------|------|------|------|-------|-------|--|--|
| | | | | | | | | | EP10 | EP20 | EP13 | EP55 | EP750 | EP68 | EP59 | EP29 | ED20 | ED501 | ED502 | | |
| CPGW | | | Metric | Inch | I.C | T | R | Hole | φ | | | | | | | | | | | | |
|  | Standard | CPGW 090302 | CPGW 320.5 | 9.525 | 3.18 | 0.2 | 4.4 | 4.3 | | | | | | | | | | | | | |
| | | | 090304 | 321 | 9.525 | 3.18 | 0.4 | 4.4 | 4.3 | | | | | | | | | | | | |
| | | | 090308 | 322 | 9.525 | 3.18 | 0.8 | 4.4 | 4.2 | | | | | | | | | | | | |
| | Chip breaker | MT | CPGW 080202 | CPGW 2.5(1.5)0.5 | 7.94 | 2.38 | 0.2 | 3.4 | 2.8 | | | | | | | | | | | | |
| | | | | 080204 | 2.5(1.5)1 | 7.94 | 2.38 | 0.4 | 3.4 | 2.8 | | | | | | | | | | | |
| | | | | 090302 | 320.5 | 9.525 | 3.18 | 0.2 | 4.4 | 2.8 | | | | | | | | | | | |
| | | | 090304 | 321 | 9.525 | 3.18 | 0.4 | 4.4 | 2.8 | | | | | | | | | | | | |
| | | | 090308 | 322 | 9.525 | 3.18 | 0.8 | 4.4 | 2.7 | | | | | | | | | | | | |
| | | | CPGW 080202 | CPGW 2.5(1.5)0.5 | 7.94 | 2.38 | 0.2 | 3.4 | 4.3 | | | | | | | | | | | | |
| | | | 080204 | 2.5(1.5)1 | 7.94 | 2.38 | 0.4 | 3.4 | 4.3 | | | | | | | | | | | | |
| | | | 090302 | 320.5 | 9.525 | 3.18 | 0.2 | 4.4 | 4.3 | | | | | | | | | | | | |
| | | | 090304 | 321 | 9.525 | 3.18 | 0.4 | 4.4 | 4.3 | | | | | | | | | | | | |
| | 090308 | 322 | 9.525 | 3.18 | 0.8 | 4.4 | 4.2 | | | | | | | | | | | | | | |

■ MT : Mini Tip Chip breaker type : Rough / Finish / Semi Finish

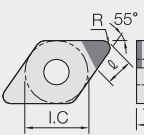
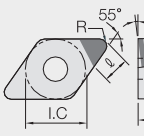
| ISO code | | | Dimensions (mm) | | | | | | PCD | | | | | | | CVD | | | | | |
|---|----------|-------------|-----------------|------------------|-----------|-------|------|------|------|------|------|------|-------|------|------|------|------|-------|-------|--|--|
| | | | | | | | | | EP10 | EP20 | EP13 | EP55 | EP750 | EP58 | EP59 | EP29 | ED20 | ED501 | ED502 | | |
| CPGT | | | Metric | Inch | I.C | T | R | Hole | φ | | | | | | | | | | | | |
|  | Standard | CPGT 090302 | CPGT 320.5 | 9.525 | 3.18 | 0.2 | 4.4 | 4.3 | | | | | | | | | | | | | |
| | | | 090304 | 321 | 9.525 | 3.18 | 0.4 | 4.4 | 4.3 | | | | | | | | | | | | |
| | | | 090308 | 322 | 9.525 | 3.18 | 0.8 | 4.4 | 4.2 | | | | | | | | | | | | |
| | MT | Standard | CPGT 080202 | CPGT 2.5(1.5)0.5 | 7.94 | 2.38 | 0.2 | 3.4 | 2.8 | | | | | | | | | | | | |
| | | | | 080204 | 2.5(1.5)1 | 7.94 | 2.38 | 0.4 | 3.4 | 2.8 | | | | | | | | | | | |
| | | | | 090302 | 320.5 | 9.525 | 3.18 | 0.2 | 4.4 | 2.8 | | | | | | | | | | | |
| | | | 090304 | 321 | 9.525 | 3.18 | 0.4 | 4.4 | 2.8 | | | | | | | | | | | | |
| | | | 090308 | 322 | 9.525 | 3.18 | 0.8 | 4.4 | 2.7 | | | | | | | | | | | | |

■ MT : Mini Tip

DN

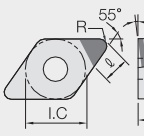
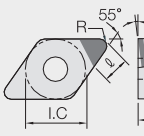
NEGATIVE _ hole

Turning

| DNGA | | ISO code | | Dimensions (mm) | | | | | PCD | | | | | | | CVD | | | | | |
|---|----------|----------|--------|-----------------|-----|-------|------|-----|------|------|------|------|-------|------|------|------|------|-------|-------|--|--|
| | | Metric | Inch | I.C | T | R | Hole | φ | EP10 | EP20 | EP13 | EP65 | EP750 | EP68 | EP69 | EP29 | ED20 | ED501 | ED502 | | |
|  | Standard | DNGA | 110404 | DNGA | 331 | 9.525 | 4.76 | 0.4 | 3.81 | 3.9 | | | | | | | | | | | |
| | | | 110408 | | 332 | 9.525 | 4.76 | 0.8 | 3.81 | 3.5 | | | | | | | | | | | |
| | | | 150404 | | 431 | 12.7 | 4.76 | 0.4 | 5.16 | 3.9 | | | | | | | | | | | |
| | | | 150408 | | 432 | 12.7 | 4.76 | 0.8 | 5.16 | 3.5 | | | | | | | | | | | |
| | | | 150412 | | 433 | 12.7 | 4.76 | 1.2 | 5.16 | 3.1 | | | | | | | | | | | |
|  | MT | DNGA | 110404 | DNGA | 331 | 9.525 | 4.76 | 0.4 | 3.81 | 2.4 | | | | | | | | | | | |
| | | | 110408 | | 332 | 9.525 | 4.76 | 0.8 | 3.81 | 2 | | | | | | | | | | | |
| | | | 150404 | | 431 | 12.7 | 4.76 | 0.4 | 5.16 | 2.4 | | | | | | | | | | | |
| | | | 150408 | | 432 | 12.7 | 4.76 | 0.8 | 5.16 | 2 | | | | | | | | | | | |
| | | | 150412 | | 433 | 12.7 | 4.76 | 1.2 | 5.16 | 2.1 | | | | | | | | | | | |

■ MT : Mini Tip

Holder : 53p, 57p, 58p, 61p, 62p

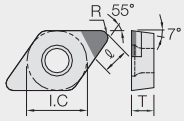
| DNGX | | ISO code | | Dimensions (mm) | | | | | PCD | | | | | | | CVD | | | | | |
|---|----------|----------|--------|-----------------|-----|-------|------|-----|------|------|------|------|-------|------|------|------|------|-------|-------|--|--|
| | | Metric | Inch | I.C | T | R | Hole | φ | EP10 | EP20 | EP13 | EP65 | EP750 | EP68 | EP69 | EP29 | ED20 | ED501 | ED502 | | |
|  | Standard | DNGX | 110404 | DNGX | 331 | 9.525 | 4.76 | 0.4 | 3.81 | 3.9 | | | | | | | | | | | |
| | | | 110408 | | 332 | 9.525 | 4.76 | 0.8 | 3.81 | 3.5 | | | | | | | | | | | |
| | | | 150404 | | 431 | 12.7 | 4.76 | 0.4 | 5.16 | 3.9 | | | | | | | | | | | |
| | | | 150408 | | 432 | 12.7 | 4.76 | 0.8 | 5.16 | 3.5 | | | | | | | | | | | |
| | | | 150412 | | 433 | 12.7 | 4.76 | 1.2 | 5.16 | 3.1 | | | | | | | | | | | |
|  | MT | DNGX | 110404 | DNGX | 331 | 9.525 | 4.76 | 0.4 | 3.81 | 2.4 | | | | | | | | | | | |
| | | | 110408 | | 332 | 9.525 | 4.76 | 0.8 | 3.81 | 2 | | | | | | | | | | | |
| | | | 150404 | | 431 | 12.7 | 4.76 | 0.4 | 5.16 | 2.4 | | | | | | | | | | | |
| | | | 150408 | | 432 | 12.7 | 4.76 | 0.8 | 5.16 | 2 | | | | | | | | | | | |
| | | | 150412 | | 433 | 12.7 | 4.76 | 1.2 | 5.16 | 2.1 | | | | | | | | | | | |

■ MT : Mini Tip

Holder : 53p, 57p, 58p, 61p, 62p

DC 
POSITIVE 7 _ hole

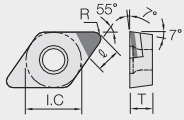
| DCGW | ISO code | | Dimensions (mm) | | | | | | PCD | | | | | | CVD | | | |
|--------------|-------------|----------------|-----------------|------|-----|------|-----|------|------|------|------|-------|------|------|------|------|-------|-------|
| | Metric | Inch | I.C | T | R | Hole | φ | EP10 | EP20 | EP13 | EP55 | EP750 | EP58 | EP59 | EP29 | ED20 | ED501 | ED502 |
| | | | | | | | | | | | | | | | | | | |
| Standard | DCGW 11T302 | DCGW 3(2.5)0.5 | 9.525 | 3.97 | 0.4 | 4.4 | 4 | | | | | | | | | | | |
| | 11T304 | 3(2.5)1 | 9.525 | 3.97 | 0.4 | 4.4 | 3.9 | | | | | | | | | | | |
| | 11T308 | 3(2.5)2 | 9.525 | 3.97 | 0.8 | 4.4 | 3.5 | | | | | | | | | | | |
| | 150404 | 431 | 12.7 | 4.76 | 0.4 | 5.16 | 3.9 | | | | | | | | | | | |
| | 150408 | 432 | 12.7 | 4.76 | 0.8 | 5.16 | 3.5 | | | | | | | | | | | |
| MT | DCGW 070202 | DCGW 2(1.5)0.5 | 6.35 | 2.38 | 0.2 | 2.8 | 2.5 | | | | | | | | | | | |
| | 070204 | 2(1.5)1 | 6.35 | 2.38 | 0.4 | 2.8 | 2.4 | | | | | | | | | | | |
| | 11T302 | 3(2.5)0.5 | 9.525 | 3.97 | 0.4 | 4.4 | 2.5 | | | | | | | | | | | |
| | 11T304 | 3(2.5)1 | 9.525 | 3.97 | 0.4 | 4.4 | 2.4 | | | | | | | | | | | |
| | 11T308 | 3(2.5)2 | 9.525 | 3.97 | 0.8 | 4.4 | 2 | | | | | | | | | | | |
| Chip breaker | DCGW 070202 | DCGW 2(1.5)0.5 | 6.35 | 2.38 | 0.2 | 2.8 | 3 | | | | | | | | | | | |
| | 070204 | 2(1.5)1 | 6.35 | 2.38 | 0.4 | 2.8 | 2.9 | | | | | | | | | | | |
| | 11T302 | 3(2.5)0.5 | 9.525 | 3.97 | 0.4 | 4.4 | 4 | | | | | | | | | | | |
| | 11T304 | 3(2.5)1 | 9.525 | 3.97 | 0.4 | 4.4 | 3.9 | | | | | | | | | | | |
| | 11T308 | 3(2.5)2 | 9.525 | 3.97 | 0.8 | 4.4 | 3.5 | | | | | | | | | | | |



■ MT : Mini Tip Chip breaker type : Rough / Finish / Semi Finish

 Holder : 67p

| DCGT | ISO code | | Dimensions (mm) | | | | | | PCD | | | | | | CVD | | | |
|----------|-------------|----------------|-----------------|------|-----|------|-----|------|------|------|------|-------|------|------|------|------|-------|-------|
| | Metric | Inch | I.C | T | R | Hole | φ | EP10 | EP20 | EP13 | EP55 | EP750 | EP58 | EP59 | EP29 | ED20 | ED501 | ED502 |
| | | | | | | | | | | | | | | | | | | |
| Standard | DCGT 11T302 | DCGT 3(2.5)0.5 | 9.525 | 3.97 | 0.4 | 4.4 | 4 | | | | | | | | | | | |
| | 11T304 | 3(2.5)1 | 9.525 | 3.97 | 0.4 | 4.4 | 3.9 | | | | | | | | | | | |
| | 11T308 | 3(2.5)2 | 9.525 | 3.97 | 0.8 | 4.4 | 3.5 | | | | | | | | | | | |
| | 150404 | 431 | 12.7 | 4.76 | 0.4 | 5.16 | 3.9 | | | | | | | | | | | |
| | 150408 | 432 | 12.7 | 4.76 | 0.8 | 5.16 | 3.5 | | | | | | | | | | | |
| MT | DCGT 070202 | DCGT 2(1.5)0.5 | 6.35 | 2.38 | 0.2 | 2.8 | 2.5 | | | | | | | | | | | |
| | 070204 | 2(1.5)1 | 6.35 | 2.38 | 0.4 | 2.8 | 2.4 | | | | | | | | | | | |
| | 11T302 | 3(2.5)0.5 | 9.525 | 3.97 | 0.4 | 4.4 | 2.5 | | | | | | | | | | | |
| | 11T304 | 3(2.5)1 | 9.525 | 3.97 | 0.4 | 4.4 | 2.4 | | | | | | | | | | | |
| | 11T308 | 3(2.5)2 | 9.525 | 3.97 | 0.8 | 4.4 | 2 | | | | | | | | | | | |



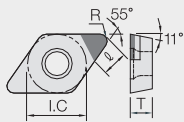
■ MT : Mini Tip

 Holder : 67p

DP

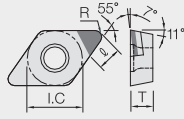
POSITIVE 11 _ hole

| ISO code | | | Dimensions (mm) | | | | | PCD | | | | | | | | CVD | | | | | |
|--------------|------|--------|-----------------|-----------|-------|------|------|------|------|------|------|-------|------|------|------|------|-------|-------|--|--|--|
| | | | | | | | | EP10 | EP20 | EP13 | EP55 | EP750 | EP68 | EP59 | EP29 | ED20 | ED501 | ED502 | | | |
| DPGW | | Metric | Inch | I.C | T | R | Hole | φ | | | | | | | | | | | | | |
| Standard | DPGW | 11T302 | DPGW | 3(2.5)0.5 | 9.525 | 3.97 | 0.4 | 4.4 | 4 | | | | | | | | | | | | |
| | | 11T304 | | 3(2.5)1 | 9.525 | 3.97 | 0.4 | 4.4 | 3.9 | | | | | | | | | | | | |
| | | 11T308 | | 3(2.5)2 | 9.525 | 3.97 | 0.8 | 4.4 | 3.5 | | | | | | | | | | | | |
| MT | DPGW | 070202 | DPGW | 2(1.5)0.5 | 6.35 | 2.38 | 0.2 | 2.8 | 2.5 | | | | | | | | | | | | |
| | | 070204 | | 2(1.5)1 | 6.35 | 2.38 | 0.4 | 2.8 | 2.4 | | | | | | | | | | | | |
| | | 11T302 | | 3(2.5)0.5 | 9.525 | 3.97 | 0.4 | 4.4 | 2.5 | | | | | | | | | | | | |
| Chip breaker | | 11T304 | | 3(2.5)1 | 9.525 | 3.97 | 0.4 | 4.4 | 2.4 | | | | | | | | | | | | |
| | | 11T308 | | 3(2.5)2 | 9.525 | 3.97 | 0.8 | 4.4 | 2 | | | | | | | | | | | | |
| | DPGW | 070202 | DPGW | 2(1.5)0.5 | 6.35 | 2.38 | 0.2 | 2.8 | 3 | | | | | | | | | | | | |
| | | 070204 | | 2(1.5)1 | 6.35 | 2.38 | 0.4 | 2.8 | 2.9 | | | | | | | | | | | | |
| | | 11T302 | | 3(2.5)0.5 | 9.525 | 3.97 | 0.4 | 4.4 | 4 | | | | | | | | | | | | |
| | | 11T304 | | 3(2.5)1 | 9.525 | 3.97 | 0.4 | 4.4 | 3.9 | | | | | | | | | | | | |
| | | 11T308 | | 3(2.5)2 | 9.525 | 3.97 | 0.8 | 4.4 | 3.5 | | | | | | | | | | | | |



■ MT : Mini Tip Chip breaker type : Rough / Finish / Semi Finish

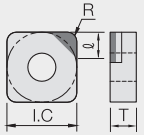
| ISO code | | | Dimensions (mm) | | | | | PCD | | | | | | | | CVD | | | | | |
|----------|------|--------|-----------------|-----------|-------|------|------|------|------|------|------|-------|------|------|------|------|-------|-------|--|--|--|
| | | | | | | | | EP10 | EP20 | EP13 | EP55 | EP750 | EP58 | EP59 | EP29 | ED20 | ED501 | ED502 | | | |
| DPGT | | Metric | Inch | I.C | T | R | Hole | φ | | | | | | | | | | | | | |
| Standard | DPGT | 11T302 | DPGT | 3(2.5)0.5 | 9.525 | 3.97 | 0.4 | 4.4 | 4 | | | | | | | | | | | | |
| | | 11T304 | | 3(2.5)1 | 9.525 | 3.97 | 0.4 | 4.4 | 3.9 | | | | | | | | | | | | |
| | | 11T308 | | 3(2.5)2 | 9.525 | 3.97 | 0.8 | 4.4 | 3.5 | | | | | | | | | | | | |
| MT | DPGT | 070202 | DPGT | 2(1.5)0.5 | 6.35 | 2.38 | 0.2 | 2.8 | 2.5 | | | | | | | | | | | | |
| | | 070204 | | 2(1.5)1 | 6.35 | 2.38 | 0.4 | 2.8 | 2.4 | | | | | | | | | | | | |
| | | 11T302 | | 3(2.5)0.5 | 9.525 | 3.97 | 0.4 | 4.4 | 2.5 | | | | | | | | | | | | |
| | | 11T304 | | 3(2.5)1 | 9.525 | 3.97 | 0.4 | 4.4 | 2.4 | | | | | | | | | | | | |
| | | 11T308 | | 3(2.5)2 | 9.525 | 3.97 | 0.8 | 4.4 | 2 | | | | | | | | | | | | |



■ MT : Mini Tip

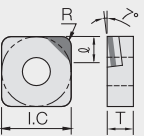
SN

NEGATIVE _ hole

| SNGA | ISO code | | Dimensions (mm) | | | | | | PCD | | | | | | CVD | | | | |
|---|----------|-------------|-----------------|-------|-------|------|------|------|------|------|------|-------|------|------|------|------|-------|-------|--|
| | Metric | Inch | I.C | T | R | Hole | φ | EP10 | EP20 | EP13 | EP55 | EP750 | EP68 | EP59 | EP29 | ED20 | ED501 | ED502 | |
| | | | | | | | | | | | | | | | | | | | |
|  | Standard | SNGA 090304 | SNGA 321 | 9.525 | 3.18 | 0.4 | 3.81 | 4.4 | | | | | | | | | | | |
| | | | 090308 | 322 | 9.525 | 3.18 | 0.8 | 3.81 | 4.4 | | | | | | | | | | |
| | | | 120404 | 431 | 12.7 | 4.76 | 0.4 | 5.16 | 4.4 | | | | | | | | | | |
| | | | 120408 | 432 | 12.7 | 4.76 | 0.8 | 5.16 | 4.4 | | | | | | | | | | |
| | | | 120412 | 433 | 12.7 | 4.76 | 1.2 | 5.16 | 4.4 | | | | | | | | | | |
| | MT | SNGA 090304 | SNGA 321 | 9.525 | 3.18 | 0.4 | 3.81 | 2.9 | | | | | | | | | | | |
| | | | 090308 | 322 | 9.525 | 3.18 | 0.8 | 3.81 | 2.9 | | | | | | | | | | |
| | | | 120404 | 431 | 12.7 | 4.76 | 0.4 | 5.16 | 2.9 | | | | | | | | | | |
| | | | 120408 | 432 | 12.7 | 4.76 | 0.8 | 5.16 | 2.9 | | | | | | | | | | |
| | | | 120412 | 433 | 12.7 | 4.76 | 1.2 | 5.16 | 3.4 | | | | | | | | | | |

■ MT : Mini Tip

Holder : 54p, 55p, 58p, 59p, 62p, 63p

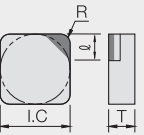
| SNGX | ISO code | | Dimensions (mm) | | | | | | PCD | | | | | | CVD | | | | |
|---|----------|-------------|-----------------|-------|-------|------|------|------|------|------|------|-------|------|------|------|------|-------|-------|--|
| | Metric | Inch | I.C | T | R | Hole | φ | EP10 | EP20 | EP13 | EP55 | EP750 | EP68 | EP59 | EP29 | ED20 | ED501 | ED502 | |
| | | | | | | | | | | | | | | | | | | | |
|  | Standard | SNGX 090304 | SNGX 321 | 9.525 | 3.18 | 0.4 | 3.81 | 4.4 | | | | | | | | | | | |
| | | | 090308 | 322 | 9.525 | 3.18 | 0.8 | 3.81 | 4.4 | | | | | | | | | | |
| | | | 120404 | 431 | 12.7 | 4.76 | 0.4 | 5.16 | 4.4 | | | | | | | | | | |
| | | | 120408 | 432 | 12.7 | 4.76 | 0.8 | 5.16 | 4.4 | | | | | | | | | | |
| | | | 120412 | 433 | 12.7 | 4.76 | 1.2 | 5.16 | 4.4 | | | | | | | | | | |
| | MT | SNGX 090304 | SNGX 321 | 9.525 | 3.18 | 0.4 | 3.81 | 2.9 | | | | | | | | | | | |
| | | | 090308 | 322 | 9.525 | 3.18 | 0.8 | 3.81 | 2.9 | | | | | | | | | | |
| | | | 120404 | 431 | 12.7 | 4.76 | 0.4 | 5.16 | 2.9 | | | | | | | | | | |
| | | | 120408 | 432 | 12.7 | 4.76 | 0.8 | 5.16 | 2.9 | | | | | | | | | | |
| | | | 120412 | 433 | 12.7 | 4.76 | 1.2 | 5.16 | 3.4 | | | | | | | | | | |

■ MT : Mini Tip

Holder : 54p, 55p, 58p, 59p, 62p, 63p

SNGN

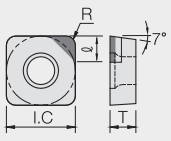
NEGATIVE

| SNGN | ISO code | | Dimensions (mm) | | | | | | PCD | | | | | | CVD | | | | |
|---|----------|-------------|-----------------|-------|-------|------|------|------|------|------|------|-------|------|------|------|------|-------|-------|--|
| | Metric | Inch | I.C | T | R | Hole | φ | EP10 | EP20 | EP13 | EP55 | EP750 | EP68 | EP59 | EP29 | ED20 | ED501 | ED502 | |
| | | | | | | | | | | | | | | | | | | | |
|  | Standard | SNGN 090304 | SNGN 321 | 9.525 | 3.18 | 0.4 | 3.81 | 4.4 | | | | | | | | | | | |
| | | | 090308 | 322 | 9.525 | 3.18 | 0.8 | 3.81 | 4.4 | | | | | | | | | | |
| | | | 120404 | 431 | 12.7 | 4.76 | 0.4 | 5.16 | 4.4 | | | | | | | | | | |
| | | | 120408 | 432 | 12.7 | 4.76 | 0.8 | 5.16 | 4.4 | | | | | | | | | | |
| | | | 120412 | 433 | 12.7 | 4.76 | 1.2 | 5.16 | 4.4 | | | | | | | | | | |
| | MT | SNGN 090304 | SNGN 321 | 9.525 | 3.18 | 0.4 | 3.81 | 2.9 | | | | | | | | | | | |
| | | | 090308 | 322 | 9.525 | 3.18 | 0.8 | 3.81 | 2.9 | | | | | | | | | | |
| | | | 120404 | 431 | 12.7 | 4.76 | 0.4 | 5.16 | 2.9 | | | | | | | | | | |
| | | | 120408 | 432 | 12.7 | 4.76 | 0.8 | 5.16 | 2.9 | | | | | | | | | | |
| | | | 120412 | 433 | 12.7 | 4.76 | 1.2 | 5.16 | 3.4 | | | | | | | | | | |

■ MT : Mini Tip

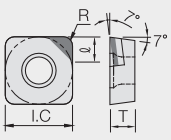
SC POSITIVE 7 _ hole

Turning

| ISO code | | | Dimensions (mm) | | | | | PCD | | | | | | | | CVD | | | | | | | |
|---|----------|-------------|-----------------|------|------|------|------|------|------|------|------|-------|------|------|------|------|-------|-------|--|--|--|--|--|
| | | | | | | | | EP10 | EP20 | EP13 | EP55 | EP750 | EP58 | EP59 | EP29 | ED20 | ED501 | ED502 | | | | | |
| SCGW | | Metric | Inch | I.C | T | R | Hole | φ | | | | | | | | | | | | | | | |
|  | Standard | SCGW 120404 | SCGW 431 | 12.7 | 4.76 | 0.4 | 5.5 | 4.4 | | | | | | | | | | | | | | | |
| | | | 120408 | 432 | 12.7 | 4.76 | 0.8 | 5.5 | 4.4 | | | | | | | | | | | | | | |
| | | | 120412 | 433 | 12.7 | 4.76 | 1.2 | 5.5 | 4.4 | | | | | | | | | | | | | | |
| | MT | SCGW 120404 | SCGW 431 | 12.7 | 4.76 | 0.4 | 5.5 | 2.9 | | | | | | | | | | | | | | | |
| | | | 120408 | 432 | 12.7 | 4.76 | 0.8 | 5.5 | 2.9 | | | | | | | | | | | | | | |
| | | | 120412 | 433 | 12.7 | 4.76 | 1.2 | 5.5 | 3.4 | | | | | | | | | | | | | | |

■ MT : Mini Tip

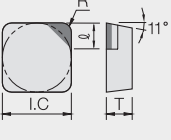
Holder : 69p, 70p

| ISO code | | | Dimensions (mm) | | | | | PCD | | | | | | | | CVD | | | | | | | |
|--|----------|-------------|-----------------|------|------|------|------|------|------|------|------|-------|------|------|------|------|-------|-------|--|--|--|--|--|
| | | | | | | | | EP10 | EP20 | EP13 | EP55 | EP750 | EP58 | EP59 | EP29 | ED20 | ED501 | ED502 | | | | | |
| SCGT | | Metric | Inch | I.C | T | R | Hole | φ | | | | | | | | | | | | | | | |
|  | Standard | SCGT 120404 | SCGT 431 | 12.7 | 4.76 | 0.4 | 5.5 | 4.4 | | | | | | | | | | | | | | | |
| | | | 120408 | 432 | 12.7 | 4.76 | 0.8 | 5.5 | 4.4 | | | | | | | | | | | | | | |
| | | | 120412 | 433 | 12.7 | 4.76 | 1.2 | 5.5 | 4.4 | | | | | | | | | | | | | | |
| | MT | SCGT 120404 | SCGT 431 | 12.7 | 4.76 | 0.4 | 5.5 | 2.9 | | | | | | | | | | | | | | | |
| | | | 120408 | 432 | 12.7 | 4.76 | 0.8 | 5.5 | 2.9 | | | | | | | | | | | | | | |
| | | | 120412 | 433 | 12.7 | 4.76 | 1.2 | 5.5 | 3.4 | | | | | | | | | | | | | | |

■ MT : Mini Tip

Holder : 69p, 70p

SPGN POSITIVE 11

| ISO code | | | Dimensions (mm) | | | | | PCD | | | | | | | | CVD | | | | | | | |
|---|----------|-------------|-----------------|-------|-------|------|------|------|------|------|------|-------|------|------|------|------|-------|-------|--|--|--|--|--|
| | | | | | | | | EP10 | EP20 | EP13 | EP55 | EP750 | EP58 | EP59 | EP29 | ED20 | ED501 | ED502 | | | | | |
| SPGN | | Metric | Inch | I.C | T | R | Hole | φ | | | | | | | | | | | | | | | |
|  | Standard | SPGN 090304 | SPGN 321 | 9.525 | 3.18 | 0.4 | | 4.4 | | | | | | | | | | | | | | | |
| | | | 090308 | 322 | 9.525 | 3.18 | 0.8 | | 4.4 | | | | | | | | | | | | | | |
| | | | 120304 | 421 | 12.7 | 4.76 | 0.4 | | 4.4 | | | | | | | | | | | | | | |
| | MT | SPGN 090304 | SPGN 321 | 9.525 | 3.18 | 0.4 | | 2.9 | | | | | | | | | | | | | | | |
| | | | 090308 | 322 | 9.525 | 3.18 | 0.8 | | 2.9 | | | | | | | | | | | | | | |
| | | | 120304 | 421 | 12.7 | 4.76 | 0.4 | | 2.9 | | | | | | | | | | | | | | |

■ MT : Mini Tip

SP

POSITIVE 11 _ hole

| | ISO code | ISO code | | Dimensions (mm) | | | | | PCD | | | | | | | CVD | | | |
|--|----------|-------------|----------|-----------------|------|-----|------|-----|------|------|------|------|-------|------|------|------|------|-------|-------|
| | | Metric | Inch | I.C | T | R | Hole | φ | EP10 | EP20 | EP13 | EP55 | EP750 | EP68 | EP59 | EP29 | ED20 | ED501 | ED502 |
| | | | | | | | | | | | | | | | | | | | |
| | Standard | SPGW 090304 | SPGW 321 | 12.7 | 4.76 | 0.4 | 4.4 | 4.4 | | | | | | | | | | | |
| | | 090308 | 322 | 12.7 | 4.76 | 0.8 | 4.4 | 4.4 | | | | | | | | | | | |
| | | 120404 | 431 | 12.7 | 4.76 | 0.4 | 5.5 | 4.4 | | | | | | | | | | | |
| | | 120408 | 432 | 12.7 | 4.76 | 0.8 | 5.5 | 4.4 | | | | | | | | | | | |
| | | 120412 | 433 | 12.7 | 4.76 | 1.2 | 5.5 | 4.4 | | | | | | | | | | | |
| | MT | SPGW 090304 | SPGW 321 | 12.7 | 4.76 | 0.4 | 4.4 | 2.9 | | | | | | | | | | | |
| | | 090308 | 322 | 12.7 | 4.76 | 0.8 | 4.4 | 2.9 | | | | | | | | | | | |
| | | 120404 | 431 | 12.7 | 4.76 | 0.4 | 5.5 | 2.9 | | | | | | | | | | | |
| | | 120408 | 432 | 12.7 | 4.76 | 0.8 | 5.5 | 2.9 | | | | | | | | | | | |
| | | 120412 | 433 | 12.7 | 4.76 | 1.2 | 5.5 | 3.4 | | | | | | | | | | | |

■ MT : Mini Tip

| | ISO code | ISO code | | Dimensions (mm) | | | | | PCD | | | | | | | CVD | | | |
|--|----------|-------------|----------|-----------------|------|-----|------|-----|------|------|------|------|-------|------|------|------|------|-------|-------|
| | | Metric | Inch | I.C | T | R | Hole | φ | EP10 | EP20 | EP13 | EP55 | EP750 | EP68 | EP59 | EP29 | ED20 | ED501 | ED502 |
| | | | | | | | | | | | | | | | | | | | |
| | Standard | SPGT 090304 | SPGT 321 | 12.7 | 4.76 | 0.4 | 4.4 | 4.4 | | | | | | | | | | | |
| | | 090308 | 322 | 12.7 | 4.76 | 0.8 | 4.4 | 4.4 | | | | | | | | | | | |
| | | 120404 | 431 | 12.7 | 4.76 | 0.4 | 5.5 | 4.4 | | | | | | | | | | | |
| | | 120408 | 432 | 12.7 | 4.76 | 0.8 | 5.5 | 4.4 | | | | | | | | | | | |
| | | 120412 | 433 | 12.7 | 4.76 | 1.2 | 5.5 | 4.4 | | | | | | | | | | | |
| | MT | SPGT 090304 | SPGT 321 | 12.7 | 4.76 | 0.4 | 4.4 | 2.9 | | | | | | | | | | | |
| | | 090308 | 322 | 12.7 | 4.76 | 0.8 | 4.4 | 2.9 | | | | | | | | | | | |
| | | 120404 | 431 | 12.7 | 4.76 | 0.4 | 5.5 | 2.9 | | | | | | | | | | | |
| | | 120408 | 432 | 12.7 | 4.76 | 0.8 | 5.5 | 2.9 | | | | | | | | | | | |
| | | 120412 | 433 | 12.7 | 4.76 | 1.2 | 5.5 | 3.4 | | | | | | | | | | | |

■ MT : Mini Tip

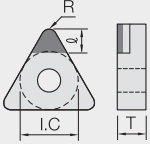
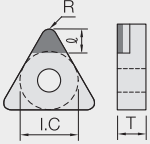
SEGN

POSITIVE 20


| | ISO code | ISO code | | Dimensions (mm) | | | | | PCD | | | | | | | CVD | | | |
|--|----------|-------------|----------|-----------------|------|-----|------|---|------|------|------|------|-------|------|------|------|------|-------|-------|
| | | Metric | Inch | I.C | T | R | Hole | φ | EP10 | EP20 | EP13 | EP55 | EP750 | EP68 | EP59 | EP29 | ED20 | ED501 | ED502 |
| | | | | | | | | | | | | | | | | | | | |
| | Standard | SEGN 120304 | SEGN 431 | 12.7 | 3.18 | 0.4 | 4.4 | | | | | | | | | | | | |
| | | 120308 | 432 | 12.7 | 3.18 | 0.8 | 4.4 | | | | | | | | | | | | |

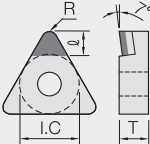
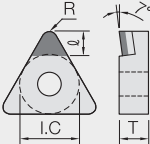
TN

NEGATIVE _ hole


| TNGA | | ISO code | | Dimensions (mm) | | | | | PCD | | | | | | | CVD | | | |
|---|----------|-------------|--------------|-----------------|-------|------|------|------|------|------|------|------|-------|------|------|------|------|-------|-------|
| | | Metric | Inch | I.C | T | R | Hole | ϕ | EP10 | EP20 | EP13 | EP55 | EP750 | EP68 | EP59 | EP29 | ED20 | ED501 | ED502 |
|  | Standard | TNGA 110302 | TNGA 22(0.5) | 6.35 | 3.18 | 0.2 | 2.4 | 4.1 | | | | | | | | | | | |
| | | 110304 | | 221 | 6.35 | 3.18 | 0.4 | 2.4 | 4 | | | | | | | | | | |
| | | 160402 | | 33(0.5) | 9.525 | 4.76 | 0.2 | 3.81 | 4.1 | | | | | | | | | | |
| | | 160404 | | 331 | 9.525 | 4.76 | 0.4 | 3.81 | 4 | | | | | | | | | | |
| | | 160408 | | 332 | 9.525 | 4.76 | 0.8 | 3.81 | 3.7 | | | | | | | | | | |
| | | 220404 | | 431 | 12.7 | 4.76 | 0.4 | 5.16 | 4 | | | | | | | | | | |
|  | MT | TNGA 110302 | TNGA 22(0.5) | 6.35 | 3.18 | 0.2 | 2.4 | 2.6 | | | | | | | | | | | |
| | | 110304 | | 221 | 6.35 | 3.18 | 0.4 | 2.4 | 2.5 | | | | | | | | | | |
| | | 160402 | | 33(0.5) | 9.525 | 4.76 | 0.2 | 3.81 | 2.6 | | | | | | | | | | |
| | | 160404 | | 331 | 9.525 | 4.76 | 0.4 | 3.81 | 2.5 | | | | | | | | | | |
| | | 160408 | | 332 | 9.525 | 4.76 | 0.8 | 3.81 | 2.2 | | | | | | | | | | |

■ MT : Mini Tip

 Holder : 55p, 59p, 60p, 63p, 64p

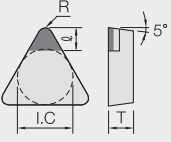
| TNGX | | ISO code | | Dimensions (mm) | | | | | PCD | | | | | | | CVD | | | |
|---|----------|-------------|--------------|-----------------|-------|------|------|------|------|------|------|------|-------|------|------|------|------|-------|-------|
| | | Metric | Inch | I.C | T | R | Hole | ϕ | EP10 | EP20 | EP13 | EP55 | EP750 | EP68 | EP59 | EP29 | ED20 | ED501 | ED502 |
|  | Standard | TNGX 110302 | TNGX 22(0.5) | 6.35 | 3.18 | 0.2 | 2.4 | 4.1 | | | | | | | | | | | |
| | | 110304 | | 221 | 6.35 | 3.18 | 0.4 | 2.4 | 4 | | | | | | | | | | |
| | | 160402 | | 33(0.5) | 9.525 | 4.76 | 0.2 | 3.81 | 4.1 | | | | | | | | | | |
| | | 160404 | | 331 | 9.525 | 4.76 | 0.4 | 3.81 | 4 | | | | | | | | | | |
| | | 160408 | | 332 | 9.525 | 4.76 | 0.8 | 3.81 | 3.7 | | | | | | | | | | |
| | | 220404 | | 431 | 12.7 | 4.76 | 0.4 | 5.16 | 4 | | | | | | | | | | |
|  | MT | TNGX 110302 | TNGX 22(0.5) | 6.35 | 3.18 | 0.2 | 2.4 | 2.6 | | | | | | | | | | | |
| | | 110304 | | 221 | 6.35 | 3.18 | 0.4 | 2.4 | 2.5 | | | | | | | | | | |
| | | 160402 | | 33(0.5) | 9.525 | 4.76 | 0.2 | 3.81 | 2.6 | | | | | | | | | | |
| | | 160404 | | 331 | 9.525 | 4.76 | 0.4 | 3.81 | 2.5 | | | | | | | | | | |
| | | 160408 | | 332 | 9.525 | 4.76 | 0.8 | 3.81 | 2.2 | | | | | | | | | | |

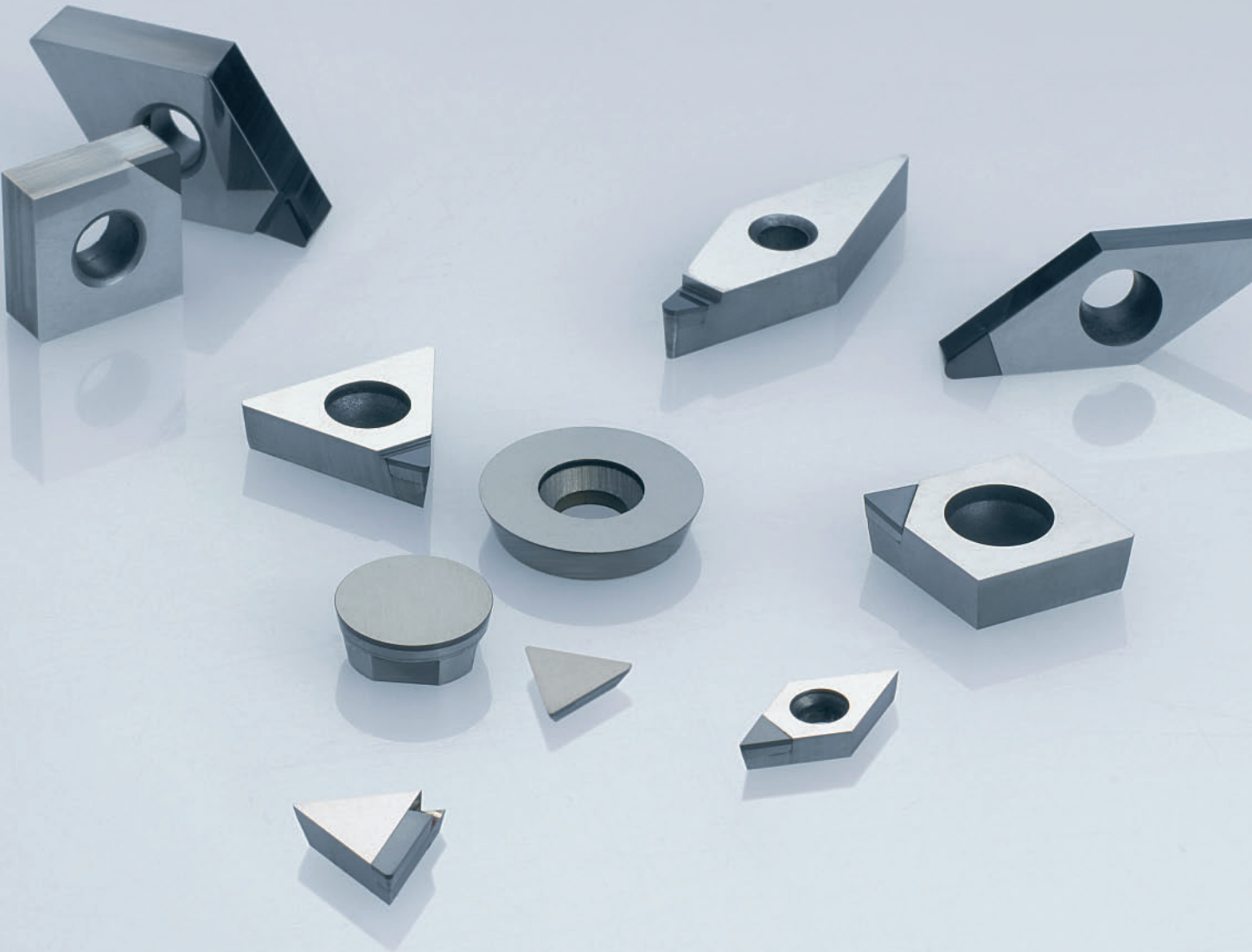
■ MT : Mini Tip

 Holder : 55p, 59p, 60p, 63p, 64p

TBGN

POSITIVE 5

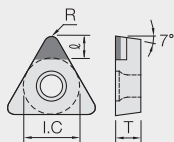
| TBGN | | ISO code | | Dimensions (mm) | | | | | PCD | | | | | | | CVD | | | |
|---|----------|-------------|----------------|-----------------|------|------|------|-----|------|------|------|------|-------|------|------|------|------|-------|-------|
| | | Metric | Inch | I.C | T | R | Hole | ϕ | EP10 | EP20 | EP13 | EP55 | EP750 | EP68 | EP59 | EP29 | ED20 | ED501 | ED502 |
|  | Standard | TBGN 060102 | TBGN (1.2)10.5 | 3.97 | 1.59 | 0.2 | | 2.1 | | | | | | | | | | | |
| | | 060104 | | (1.2)11 | 3.97 | 1.59 | 0.4 | | 2 | | | | | | | | | | |
| | | 080202 | | 1.5(1.5)0.5 | 4.76 | 2.38 | 0.2 | | 2.6 | | | | | | | | | | |
| | | 080204 | | 1.5(1.5)1 | 4.76 | 2.38 | 0.4 | | 2.5 | | | | | | | | | | |



TCGW

POSITIVE 7° hole

| TCGW | ISO code | | Dimensions (mm) | | | | | PCD | | | | | | | CVD | | | |
|----------|--------------|----------------|-----------------|------|------|------|-----|------|------|------|------|-------|------|------|------|------|-------|-------|
| | Metric | Inch | I.C | T | R | Hole | φ | EP10 | EP20 | EP13 | EP55 | EP750 | EP68 | EP59 | EP29 | ED20 | ED501 | ED502 |
| | | | | | | | | | | | | | | | | | | |
| Standard | TCGW 090202 | TCGW 2(1.5)0.5 | 5.56 | 2.38 | 0.2 | 2.5 | 3.6 | | | | | | | | | | | |
| | 090204 | 2(1.5)1 | 5.56 | 2.38 | 0.4 | 2.5 | 3.5 | | | | | | | | | | | |
| | 110202 | 2(1.5)0.5 | 6.35 | 2.38 | 0.2 | 2.8 | 4.1 | | | | | | | | | | | |
| | 110204 | 2(1.5)1 | 6.35 | 2.38 | 0.4 | 2.8 | 4 | | | | | | | | | | | |
| | 110208 | 2(1.5)2 | 6.35 | 2.38 | 0.8 | 2.8 | 3.7 | | | | | | | | | | | |
| | 16T302 | 3(2.5)0.5 | 9.525 | 3.97 | 0.2 | 4.4 | 4.1 | | | | | | | | | | | |
| | 16T304 | 3(2.5)1 | 9.525 | 3.97 | 0.4 | 4.4 | 4 | | | | | | | | | | | |
| | 16T308 | 3(2.5)2 | 9.525 | 3.97 | 0.8 | 4.4 | 3.7 | | | | | | | | | | | |
| | TCGW 090202 | TCGW 2(1.5)0.5 | 5.56 | 2.38 | 0.2 | 2.5 | 2.6 | | | | | | | | | | | |
| MT | 090204 | 2(1.5)1 | 5.56 | 2.38 | 0.4 | 2.5 | 2.5 | | | | | | | | | | | |
| | 110202 | 2(1.5)0.5 | 6.35 | 2.38 | 0.2 | 2.8 | 2.6 | | | | | | | | | | | |
| | 110204 | 2(1.5)1 | 6.35 | 2.38 | 0.4 | 2.8 | 2.5 | | | | | | | | | | | |
| | 110208 | 2(1.5)2 | 6.35 | 2.38 | 0.8 | 2.8 | 2.2 | | | | | | | | | | | |
| | 16T302 | 3(2.5)0.5 | 9.525 | 3.97 | 0.2 | 4.4 | 2.6 | | | | | | | | | | | |
| | 16T304 | 3(2.5)1 | 9.525 | 3.97 | 0.4 | 4.4 | 2.5 | | | | | | | | | | | |
| | 16T308 | 3(2.5)2 | 9.525 | 3.97 | 0.8 | 4.4 | 2.2 | | | | | | | | | | | |
| | TCGW 090202 | TCGW 2(1.5)0.5 | 5.56 | 2.38 | 0.2 | 2.5 | 3.6 | | | | | | | | | | | |
| | Chip breaker | 090204 | 2(1.5)1 | 5.56 | 2.38 | 0.4 | 2.5 | 3.5 | | | | | | | | | | |
| 110202 | | 2(1.5)0.5 | 6.35 | 2.38 | 0.2 | 2.8 | 4.1 | | | | | | | | | | | |
| 110204 | | 2(1.5)1 | 6.35 | 2.38 | 0.4 | 2.8 | 4 | | | | | | | | | | | |
| 110208 | | 2(1.5)2 | 6.35 | 2.38 | 0.8 | 2.8 | 3.7 | | | | | | | | | | | |
| 16T302 | | 3(2.5)0.5 | 9.525 | 3.97 | 0.2 | 4.4 | 4.1 | | | | | | | | | | | |
| 16T304 | | 3(2.5)1 | 9.525 | 3.97 | 0.4 | 4.4 | 4 | | | | | | | | | | | |
| 16T308 | | 3(2.5)2 | 9.525 | 3.97 | 0.8 | 4.4 | 3.7 | | | | | | | | | | | |



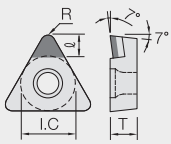
■ MT : Mini Tip Chip breaker type : Rough / Finish / Semi Finish

Holder : 70p, 71p

TCGT

POSITIVE 7° hole

| TCGT | ISO code | | Dimensions (mm) | | | | | | PCD | | | | | | | CVD | | | |
|--------------|----------|--------|-----------------|-----------|-----------|------|------|------|------|------|------|-------|------|------|------|------|-------|-------|--|
| | Metric | Inch | I.C | T | R | Hole | φ | EP10 | EP20 | EP13 | EP65 | EP750 | EP68 | EP69 | EP29 | ED20 | ED501 | ED602 | |
| | | | | | | | | | | | | | | | | | | | |
| Standard | TCGT | 090202 | TCGT | 2(1.5)0.5 | 5.56 | 2.38 | 0.2 | 2.5 | 3.6 | | | | | | | | | | |
| | | 090204 | | 2(1.5)1 | 5.56 | 2.38 | 0.4 | 2.5 | 3.5 | | | | | | | | | | |
| | | 110202 | | 2(1.5)0.5 | 6.35 | 2.38 | 0.2 | 2.8 | 4.1 | | | | | | | | | | |
| | | 110204 | | 2(1.5)1 | 6.35 | 2.38 | 0.4 | 2.8 | 4 | | | | | | | | | | |
| | | 110208 | | 2(1.5)2 | 6.35 | 2.38 | 0.8 | 2.8 | 3.7 | | | | | | | | | | |
| | | 16T302 | | 3(2.5)0.5 | 9.525 | 3.97 | 0.2 | 4.4 | 4.1 | | | | | | | | | | |
| | | 16T304 | | 3(2.5)1 | 9.525 | 3.97 | 0.4 | 4.4 | 4 | | | | | | | | | | |
| | | 16T308 | | 3(2.5)2 | 9.525 | 3.97 | 0.8 | 4.4 | 3.7 | | | | | | | | | | |
| | MT | TCGT | 090202 | TCGT | 2(1.5)0.5 | 5.56 | 2.38 | 0.2 | 2.5 | 2.6 | | | | | | | | | |
| | | | 090204 | | 2(1.5)1 | 5.56 | 2.38 | 0.4 | 2.5 | 2.5 | | | | | | | | | |
| | | 110202 | | 2(1.5)0.5 | 6.35 | 2.38 | 0.2 | 2.8 | 2.6 | | | | | | | | | | |
| | | 110204 | | 2(1.5)1 | 6.35 | 2.38 | 0.4 | 2.8 | 2.5 | | | | | | | | | | |
| | | 110208 | | 2(1.5)2 | 6.35 | 2.38 | 0.8 | 2.8 | 2.2 | | | | | | | | | | |
| | | 16T302 | | 3(2.5)0.5 | 9.525 | 3.97 | 0.2 | 4.4 | 2.6 | | | | | | | | | | |
| | | 16T304 | | 3(2.5)1 | 9.525 | 3.97 | 0.4 | 4.4 | 2.5 | | | | | | | | | | |
| | | 16T308 | | 3(2.5)2 | 9.525 | 3.97 | 0.8 | 4.4 | 2.2 | | | | | | | | | | |
| Chip breaker | | TCGT | 090202 | TCGT | 2(1.5)0.5 | 5.56 | 2.38 | 0.2 | 2.5 | 3.6 | | | | | | | | | |
| | | | 090204 | | 2(1.5)1 | 5.56 | 2.38 | 0.4 | 2.5 | 3.5 | | | | | | | | | |
| | | 110202 | | 2(1.5)0.5 | 6.35 | 2.38 | 0.2 | 2.8 | 4.1 | | | | | | | | | | |
| | | 110204 | | 2(1.5)1 | 6.35 | 2.38 | 0.4 | 2.8 | 4 | | | | | | | | | | |
| | | 110208 | | 2(1.5)2 | 6.35 | 2.38 | 0.8 | 2.8 | 3.7 | | | | | | | | | | |
| | | 16T302 | | 3(2.5)0.5 | 9.525 | 3.97 | 0.2 | 4.4 | 4.1 | | | | | | | | | | |
| | | 16T304 | | 3(2.5)1 | 9.525 | 3.97 | 0.4 | 4.4 | 4 | | | | | | | | | | |
| | | 16T308 | | 3(2.5)2 | 9.525 | 3.97 | 0.8 | 4.4 | 3.7 | | | | | | | | | | |



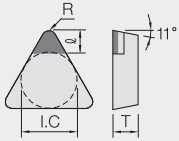
■ MT : Mini Tip Chip breaker type : Rough / Finish / Semi Finish

Holder : 70p, 71p

TPGN

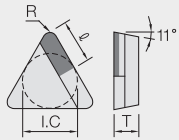
POSITIVE 11

| TPGN | ISO code | | Dimensions (mm) | | | | | PCD | | | | | | | CVD | | | |
|--------------|----------|--------|-----------------|---------|-------|------|-----|------|------|------|------|-------|------|------|------|------|-------|-------|
| | Metric | Inch | I.C | T | R | Hole | φ | EP10 | EP20 | EP13 | EP55 | EP750 | EP68 | EP59 | EP29 | ED20 | ED501 | ED502 |
| | | | | | | | | | | | | | | | | | | |
| Standard | TPGN | 110302 | TPGN | 22(0.5) | 6.35 | 3.18 | 0.2 | 4.1 | | | | | | | | | | |
| | | 110304 | | 221 | 6.35 | 3.18 | 0.4 | 4 | | | | | | | | | | |
| | | 110308 | | 222 | 6.35 | 3.18 | 0.8 | 3.7 | | | | | | | | | | |
| | | 160302 | | 32(0.5) | 9.525 | 3.18 | 0.2 | 4.1 | | | | | | | | | | |
| | | 160304 | | 321 | 9.525 | 3.18 | 0.4 | 4 | | | | | | | | | | |
| | | 160308 | | 322 | 9.525 | 3.18 | 0.8 | 3.7 | | | | | | | | | | |
| MT | TPGN | 110302 | TPGN | 22(0.5) | 6.35 | 3.18 | 0.2 | 2.6 | | | | | | | | | | |
| | | 110304 | | 221 | 6.35 | 3.18 | 0.4 | 2.5 | | | | | | | | | | |
| | | 110308 | | 222 | 6.35 | 3.18 | 0.8 | 2.2 | | | | | | | | | | |
| | | 160302 | | 32(0.5) | 9.525 | 3.18 | 0.2 | 2.6 | | | | | | | | | | |
| | | 160304 | | 321 | 9.525 | 3.18 | 0.4 | 2.5 | | | | | | | | | | |
| | | 160308 | | 322 | 9.525 | 3.18 | 0.8 | 2.2 | | | | | | | | | | |
| Chip breaker | TPGN | 110302 | TPGN | 22(0.5) | 6.35 | 3.18 | 0.2 | 4.1 | | | | | | | | | | |
| | | 110304 | | 221 | 6.35 | 3.18 | 0.4 | 4 | | | | | | | | | | |
| | | 110308 | | 222 | 6.35 | 3.18 | 0.8 | 3.7 | | | | | | | | | | |
| | | 160302 | | 32(0.5) | 9.525 | 3.18 | 0.2 | 4.1 | | | | | | | | | | |
| | | 160304 | | 321 | 9.525 | 3.18 | 0.4 | 4 | | | | | | | | | | |
| | | 160308 | | 322 | 9.525 | 3.18 | 0.8 | 3.7 | | | | | | | | | | |

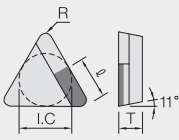


■ MT : Mini Tip Chip breaker type : Rough / Finish / Semi Finish

| TPGN (L) | ISO code | | Dimensions (mm) | | | | | PCD | | | | | | | CVD | | | |
|----------|----------|----------|-----------------|-------|-------|------|-----|------|------|------|------|-------|------|------|------|------|-------|-------|
| | Metric | Inch | I.C | T | R | Hole | φ | EP10 | EP20 | EP13 | EP55 | EP750 | EP58 | EP59 | EP29 | ED20 | ED501 | ED502 |
| | | | | | | | | | | | | | | | | | | |
| Standard | TPGN | 160304 L | TPGN | 331 L | 9.525 | 3.18 | 0.4 | | | | | | | | | | | |
| | | 160308 L | | 332 L | 9.525 | 3.18 | 0.8 | | | | | | | | | | | |



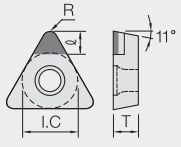
| TPGN (R) | ISO code | | Dimensions (mm) | | | | | PCD | | | | | | | CVD | | | |
|----------|----------|----------|-----------------|-------|-------|------|-----|------|------|------|------|-------|------|------|------|------|-------|-------|
| | Metric | Inch | I.C | T | R | Hole | φ | EP10 | EP20 | EP13 | EP55 | EP750 | EP58 | EP59 | EP29 | ED20 | ED501 | ED502 |
| | | | | | | | | | | | | | | | | | | |
| Standard | TPGN | 160304 R | TPGN | 331 R | 9.525 | 3.18 | 0.4 | | | | | | | | | | | |
| | | 160308 R | | 332 R | 9.525 | 3.18 | 0.8 | | | | | | | | | | | |



TPGW

POSITIVE 11 _ hole

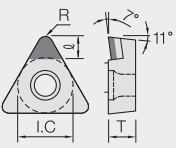
| TPGW | ISO code | | Dimensions (mm) | | | | | | PCD | | | | | | | CVD | | |
|--------------|----------|--------|-----------------|-------------|-------|------|-----|------|------|------|------|-------|------|------|------|------|-------|-------|
| | Metric | Inch | I.C | T | R | Hole | φ | EP10 | EP20 | EP13 | EP55 | EP750 | EP68 | EP59 | EP29 | ED20 | ED501 | ED602 |
| | | | | | | | | | | | | | | | | | | |
| Standard | TPGW | 110202 | TPGW | 210.5 | 6.35 | 2.38 | 0.2 | 2.8 | 4.1 | | | | | | | | | |
| | | 110204 | | 211 | 6.35 | 2.38 | 0.4 | 2.8 | 4 | | | | | | | | | |
| | | 110304 | | 221 | 6.35 | 3.18 | 0.4 | 3.4 | 4 | | | | | | | | | |
| | | 110308 | | 222 | 6.35 | 3.18 | 0.8 | 3.4 | 3.7 | | | | | | | | | |
| | | 160302 | | 32(0.5) | 9.525 | 3.18 | 0.2 | 4.4 | 4.1 | | | | | | | | | |
| | | 160304 | | 321 | 9.525 | 3.18 | 0.4 | 4.4 | 4 | | | | | | | | | |
| | | 160308 | | 322 | 9.525 | 3.18 | 0.8 | 4.4 | 3.7 | | | | | | | | | |
| | | 160404 | | 331 | 9.525 | 4.76 | 0.4 | 4.4 | 4 | | | | | | | | | |
| | | 160408 | | 332 | 9.525 | 4.76 | 0.8 | 4.4 | 3.7 | | | | | | | | | |
| MT | TPGW | 080202 | TPGW | 1.5(1.5)0.5 | 4.76 | 2.38 | 0.2 | 2.3 | 2.6 | | | | | | | | | |
| | | 080204 | | 1.5(1.5)1 | 4.76 | 2.38 | 0.4 | 2.3 | 2.5 | | | | | | | | | |
| | | 110202 | | 210.5 | 6.35 | 2.38 | 0.2 | 2.8 | 2.6 | | | | | | | | | |
| | | 110204 | | 211 | 6.35 | 2.38 | 0.4 | 2.8 | 2.5 | | | | | | | | | |
| | | 110304 | | 221 | 6.35 | 3.18 | 0.4 | 3.4 | 2.5 | | | | | | | | | |
| | | 110308 | | 222 | 6.35 | 3.18 | 0.8 | 3.4 | 2.2 | | | | | | | | | |
| | | 160302 | | 32(0.5) | 9.525 | 3.18 | 0.2 | 4.4 | 2.6 | | | | | | | | | |
| | | 160304 | | 321 | 9.525 | 3.18 | 0.4 | 4.4 | 2.5 | | | | | | | | | |
| | | 160308 | | 322 | 9.525 | 3.18 | 0.8 | 4.4 | 2.2 | | | | | | | | | |
| | | 160404 | | 331 | 9.525 | 4.76 | 0.4 | 4.4 | 2.5 | | | | | | | | | |
| | | 160408 | | 332 | 9.525 | 4.76 | 0.8 | 4.4 | 2.2 | | | | | | | | | |
| Chip breaker | TPGW | 080202 | TPGW | 1.5(1.5)0.5 | 4.76 | 2.38 | 0.2 | 2.3 | 3.1 | | | | | | | | | |
| | | 080204 | | 1.5(1.5)1 | 4.76 | 2.38 | 0.4 | 2.3 | 3 | | | | | | | | | |
| | | 110202 | | 210.5 | 6.35 | 2.38 | 0.2 | 2.8 | 4.1 | | | | | | | | | |
| | | 110204 | | 211 | 6.35 | 2.38 | 0.4 | 2.8 | 4 | | | | | | | | | |
| | | 110304 | | 221 | 6.35 | 3.18 | 0.4 | 3.4 | 4 | | | | | | | | | |
| | | 110308 | | 222 | 6.35 | 3.18 | 0.8 | 3.4 | 3.7 | | | | | | | | | |
| | | 160302 | | 32(0.5) | 9.525 | 3.18 | 0.2 | 4.4 | 4.1 | | | | | | | | | |
| | | 160304 | | 321 | 9.525 | 3.18 | 0.4 | 4.4 | 4 | | | | | | | | | |
| | | 160308 | | 322 | 9.525 | 3.18 | 0.8 | 4.4 | 3.7 | | | | | | | | | |
| | | 160404 | | 331 | 9.525 | 4.76 | 0.4 | 4.4 | 4 | | | | | | | | | |
| | | 160408 | | 332 | 9.525 | 4.76 | 0.8 | 4.4 | 3.7 | | | | | | | | | |



■ MT : Mini Tip Chip breaker type : Rough / Finish / Semi Finish

TPGT

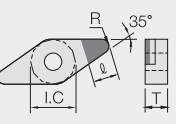
POSITIVE 11° hole

| TPGT | ISO code | | Dimensions (mm) | | | | | | PCD | | | | | | | | CVD | | | | | | |
|---|----------|------|-----------------|------|-------------|------|------|------|------|------|------|-------|------|------|------|------|-------|-------|--|--|--|--|--|
| | Metric | Inch | I.C | T | R | Hole | φ | EP10 | EP20 | EP13 | EP55 | EP750 | EP68 | EP59 | EP29 | ED20 | ED501 | ED502 | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | |
|  | Standard | TPGT | 110202 | TPGT | 210.5 | 6.35 | 2.38 | 0.2 | 2.8 | 4.1 | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | |
| | MT | TPGT | 080202 | TPGT | 1.5(1.5)0.5 | 4.76 | 2.38 | 0.2 | 2.3 | 2.6 | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | |
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■ MT : Mini Tip

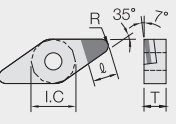
VN

NEGATIVE hole

| VNGA | ISO code | | Dimensions (mm) | | | | | | PCD | | | | | | | | CVD | | | | | |
|---|--------------|------|-----------------|------|---------|-------|------|------|------|------|------|-------|------|------|------|------|-------|-------|--|--|--|--|
| | Metric | Inch | I.C | T | R | Hole | φ | EP10 | EP20 | EP13 | EP55 | EP750 | EP68 | EP59 | EP29 | ED20 | ED501 | ED502 | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
|  | Standard | VNGA | 160402 | VNGA | 33(0.5) | 9.525 | 4.76 | 0.2 | 3.81 | 5 | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | MT | VNGA | 160402 | VNGA | 33(0.5) | 9.525 | 4.76 | 0.2 | 3.81 | 3 | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | Chip breaker | VNGA | 160402 | VNGA | 33(0.5) | 9.525 | 4.76 | 0.2 | 3.81 | 5 | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |

■ MT : Mini Tip Chip breaker type : Rough / Finish / Semi Finish

Holder : 56p, 65p

| VNGX | ISO code | | Dimensions (mm) | | | | | | PCD | | | | | | | | CVD | | | | |
|---|----------|------|-----------------|------|---------|-------|------|------|------|------|------|-------|------|------|------|------|-------|-------|--|--|--|
| | Metric | Inch | I.C | T | R | Hole | φ | EP10 | EP20 | EP13 | EP55 | EP750 | EP58 | EP59 | EP29 | ED20 | ED501 | ED502 | | | |
| | | | | | | | | | | | | | | | | | | | | | |
|  | Standard | VNGX | 160402 | VNGX | 33(0.5) | 9.525 | 4.76 | 0.2 | 3.81 | 5 | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | MT | VNGX | 160402 | VNGX | 33(0.5) | 9.525 | 4.76 | 0.2 | 3.81 | 3 | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |

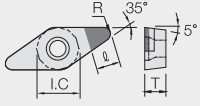
■ MT : Mini Tip

Holder : 56p, 65p

VB

POSITIVE 5 _ hole

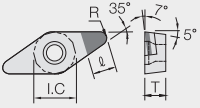
| VBGW | ISO code | | Dimensions (mm) | | | | | | PCD | | | | | | CVD | | | |
|--------------|----------|--------|-----------------|---------|-------|------|-----|------|------|------|------|-------|------|------|------|------|-------|-------|
| | Metric | Inch | I.C | T | R | Hole | φ | EP10 | EP20 | EP13 | EP55 | EP750 | EP68 | EP59 | EP29 | ED20 | ED501 | ED602 |
| | | | | | | | | | | | | | | | | | | |
| Standard | VBGW | 110302 | VBGW | 220.5 | 6.35 | 3.18 | 0.2 | 2.8 | 5 | | | | | | | | | |
| | | 110304 | | 221 | 6.35 | 3.18 | 0.4 | 2.8 | 4.5 | | | | | | | | | |
| | | 110308 | | 222 | 6.35 | 3.18 | 0.8 | 2.8 | 3.7 | | | | | | | | | |
| | | 160402 | | 32(0.5) | 9.525 | 4.76 | 0.2 | 4.4 | 5 | | | | | | | | | |
| | | 160404 | | 331 | 9.525 | 4.76 | 0.4 | 4.4 | 4.5 | | | | | | | | | |
| | | 160408 | | 332 | 9.525 | 4.76 | 0.8 | 4.4 | 3.7 | | | | | | | | | |
| | | 160412 | | 333 | 9.525 | 4.76 | 1.2 | 4.4 | 3.3 | | | | | | | | | |
| MT | VBGW | 110302 | VBGW | 220.5 | 6.35 | 3.18 | 0.2 | 2.8 | 3 | | | | | | | | | |
| | | 110304 | | 221 | 6.35 | 3.18 | 0.4 | 2.8 | 2.5 | | | | | | | | | |
| | | 110308 | | 222 | 6.35 | 3.18 | 0.8 | 2.8 | 2.2 | | | | | | | | | |
| | | 160402 | | 32(0.5) | 9.525 | 4.76 | 0.2 | 4.4 | 3 | | | | | | | | | |
| | | 160404 | | 331 | 9.525 | 4.76 | 0.4 | 4.4 | 2.5 | | | | | | | | | |
| | | 160408 | | 332 | 9.525 | 4.76 | 0.8 | 4.4 | 2.2 | | | | | | | | | |
| | | 160412 | | 333 | 9.525 | 4.76 | 1.2 | 4.4 | 1.8 | | | | | | | | | |
| Chip breaker | VBGW | 110302 | VBGW | 220.5 | 6.35 | 3.18 | 0.2 | 2.8 | 5 | | | | | | | | | |
| | | 110304 | | 221 | 6.35 | 3.18 | 0.4 | 2.8 | 4.5 | | | | | | | | | |
| | | 110308 | | 222 | 6.35 | 3.18 | 0.8 | 2.8 | 3.7 | | | | | | | | | |
| | | 160402 | | 32(0.5) | 9.525 | 4.76 | 0.2 | 4.4 | 5 | | | | | | | | | |
| | | 160404 | | 331 | 9.525 | 4.76 | 0.4 | 4.4 | 4.5 | | | | | | | | | |
| | | 160408 | | 332 | 9.525 | 4.76 | 0.8 | 4.4 | 3.7 | | | | | | | | | |
| | | 160412 | | 333 | 9.525 | 4.76 | 1.2 | 4.4 | 3.3 | | | | | | | | | |



■ MT : Mini Tip Chip breaker type : Rough / Finish / Semi Finish

Holder : 71p, 72p

| VBGT | ISO code | | Dimensions (mm) | | | | | | PCD | | | | | | CVD | | | |
|----------|----------|--------|-----------------|---------|-------|------|-----|------|------|------|------|-------|------|------|------|------|-------|-------|
| | Metric | Inch | I.C | T | R | Hole | φ | EP10 | EP20 | EP13 | EP55 | EP750 | EP68 | EP59 | EP29 | ED20 | ED501 | ED602 |
| | | | | | | | | | | | | | | | | | | |
| Standard | VBGT | 110302 | VBGT | 220.5 | 6.35 | 3.18 | 0.2 | 2.8 | 5 | | | | | | | | | |
| | | 110304 | | 221 | 6.35 | 3.18 | 0.4 | 2.8 | 4.5 | | | | | | | | | |
| | | 110308 | | 222 | 6.35 | 3.18 | 0.8 | 2.8 | 3.7 | | | | | | | | | |
| | | 160402 | | 32(0.5) | 9.525 | 4.76 | 0.2 | 4.4 | 5 | | | | | | | | | |
| | | 160404 | | 331 | 9.525 | 4.76 | 0.4 | 4.4 | 4.5 | | | | | | | | | |
| | | 160408 | | 332 | 9.525 | 4.76 | 0.8 | 4.4 | 3.7 | | | | | | | | | |
| | | 160412 | | 333 | 9.525 | 4.76 | 1.2 | 4.4 | 3.3 | | | | | | | | | |
| MT | VBGT | 110302 | VBGT | 220.5 | 6.35 | 3.18 | 0.2 | 2.8 | 3 | | | | | | | | | |
| | | 110304 | | 221 | 6.35 | 3.18 | 0.4 | 2.8 | 2.5 | | | | | | | | | |
| | | 110308 | | 222 | 6.35 | 3.18 | 0.8 | 2.8 | 2.2 | | | | | | | | | |
| | | 160402 | | 32(0.5) | 9.525 | 4.76 | 0.2 | 4.4 | 3 | | | | | | | | | |
| | | 160404 | | 331 | 9.525 | 4.76 | 0.4 | 4.4 | 2.5 | | | | | | | | | |
| | | 160408 | | 332 | 9.525 | 4.76 | 0.8 | 4.4 | 2.2 | | | | | | | | | |
| | | 160412 | | 333 | 9.525 | 4.76 | 1.2 | 4.4 | 1.8 | | | | | | | | | |



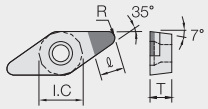
■ MT : Mini Tip

Holder : 71p, 72p

VC POSITIVE 7 _ hole

Turning

| VCGW | | ISO code | | Dimensions (mm) | | | | | PCD | | | | | | | CVD | | | |
|--------------|------|----------|------------|-----------------|-------|------|------|-----|------|------|------|------|-------|------|------|------|------|-------|-------|
| | | Metric | Inch | I.C | T | R | Hole | φ | EP10 | EP20 | EP13 | EP65 | EP750 | EP68 | EP59 | EP29 | ED20 | ED501 | ED502 |
| Standard | VCGW | 110302 | VCGW 220.5 | 6.35 | 3.18 | 0.2 | 2.8 | 5 | | | | | | | | | | | |
| | | 110304 | 221 | 6.35 | 3.18 | 0.4 | 2.8 | 4.5 | | | | | | | | | | | |
| | | 110308 | 222 | 6.35 | 3.18 | 0.8 | 2.8 | 3.7 | | | | | | | | | | | |
| | | 160402 | 32(0.5) | 9.525 | 4.76 | 0.2 | 4.4 | 5 | | | | | | | | | | | |
| | | 160404 | 331 | 9.525 | 4.76 | 0.4 | 4.4 | 4.5 | | | | | | | | | | | |
| | | 160408 | 332 | 9.525 | 4.76 | 0.8 | 4.4 | 3.7 | | | | | | | | | | | |
| | | 160412 | 333 | 9.525 | 4.76 | 1.2 | 4.4 | 3.3 | | | | | | | | | | | |
| | | 220512 | 4(3.5)3 | 12.7 | 5.56 | 1.2 | 5.5 | 3.3 | | | | | | | | | | | |
| | | 220520 | 4(3.5)5 | 12.7 | 5.56 | 2 | 5.5 | 3.1 | | | | | | | | | | | |
| | MT | VCGW | 110302 | VCGW 220.5 | 6.35 | 3.18 | 0.2 | 2.8 | 3 | | | | | | | | | | |
| | | | 110304 | 221 | 6.35 | 3.18 | 0.4 | 2.8 | 2.5 | | | | | | | | | | |
| | | | 110308 | 222 | 6.35 | 3.18 | 0.8 | 2.8 | 2.2 | | | | | | | | | | |
| | | | 160402 | 32(0.5) | 9.525 | 4.76 | 0.2 | 4.4 | 3 | | | | | | | | | | |
| | | | 160404 | 331 | 9.525 | 4.76 | 0.4 | 4.4 | 2.5 | | | | | | | | | | |
| | | 160408 | 332 | 9.525 | 4.76 | 0.8 | 4.4 | 2.2 | | | | | | | | | | | |
| Chip breaker | VCGW | 110302 | VCGW 220.5 | 6.35 | 3.18 | 0.2 | 2.8 | 5 | | | | | | | | | | | |
| | | 110304 | 221 | 6.35 | 3.18 | 0.4 | 2.8 | 4.5 | | | | | | | | | | | |
| | | 110308 | 222 | 6.35 | 3.18 | 0.8 | 2.8 | 3.7 | | | | | | | | | | | |
| | | 160402 | 32(0.5) | 9.525 | 4.76 | 0.2 | 4.4 | 5 | | | | | | | | | | | |
| | | 160404 | 331 | 9.525 | 4.76 | 0.4 | 4.4 | 4.5 | | | | | | | | | | | |
| | | 160408 | 332 | 9.525 | 4.76 | 0.8 | 4.4 | 3.7 | | | | | | | | | | | |



■ MT : Mini Tip Chip breaker type : Rough / Finish / Semi Finish

Holder : 73p

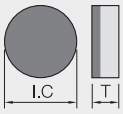
| VCGT | | ISO code | | Dimensions (mm) | | | | | PCD | | | | | | | CVD | | | |
|----------|------|----------|------------|-----------------|-------|------|------|-----|------|------|------|------|-------|------|------|------|------|-------|-------|
| | | Metric | Inch | I.C | T | R | Hole | φ | EP10 | EP20 | EP13 | EP65 | EP750 | EP68 | EP59 | EP29 | ED20 | ED501 | ED502 |
| Standard | VCGT | 110302 | VCGT 220.5 | 6.35 | 3.18 | 0.2 | 2.8 | 5 | | | | | | | | | | | |
| | | 110304 | 221 | 6.35 | 3.18 | 0.4 | 2.8 | 4.5 | | | | | | | | | | | |
| | | 110308 | 222 | 6.35 | 3.18 | 0.8 | 2.8 | 3.7 | | | | | | | | | | | |
| | | 160402 | 32(0.5) | 9.525 | 4.76 | 0.2 | 4.4 | 5 | | | | | | | | | | | |
| | | 160404 | 331 | 9.525 | 4.76 | 0.4 | 4.4 | 4.5 | | | | | | | | | | | |
| | | 160408 | 332 | 9.525 | 4.76 | 0.8 | 4.4 | 3.7 | | | | | | | | | | | |
| | | 160412 | 333 | 9.525 | 4.76 | 1.2 | 4.4 | 3.3 | | | | | | | | | | | |
| | | 220512 | 4(3.5)3 | 12.7 | 5.56 | 1.2 | 5.5 | 3.3 | | | | | | | | | | | |
| | | 220520 | 4(3.5)5 | 12.7 | 5.56 | 2 | 5.5 | 3.1 | | | | | | | | | | | |
| | MT | VCGT | 110302 | VCGT 220.5 | 6.35 | 3.18 | 0.2 | 2.8 | 3 | | | | | | | | | | |
| | | | 110304 | 221 | 6.35 | 3.18 | 0.4 | 2.8 | 2.5 | | | | | | | | | | |
| | | | 110308 | 222 | 6.35 | 3.18 | 0.8 | 2.8 | 2.2 | | | | | | | | | | |
| | | | 160402 | 32(0.5) | 9.525 | 4.76 | 0.2 | 4.4 | 3 | | | | | | | | | | |
| | | | 160404 | 331 | 9.525 | 4.76 | 0.4 | 4.4 | 2.5 | | | | | | | | | | |
| | | 160408 | 332 | 9.525 | 4.76 | 0.8 | 4.4 | 2.2 | | | | | | | | | | | |

■ MT : Mini Tip

Holder : 73p

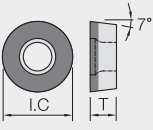
RNGN

NEGATIVE

| RNGN | ISO code | | Dimensions (mm) | | | | PCD | | | | | | | CVD | | | |
|----------|---|----------|-----------------|------|---|------|------|------|------|------|-------|------|------|------|------|-------|-------|
| | Metric | Inch | I.C | T | R | Hole | EP10 | EP20 | EP13 | EP55 | EP750 | EP58 | EP59 | EP29 | ED20 | ED501 | ED502 |
| |  | | | | | | | | | | | | | | | | |
| Standard | RNGN 090300 | RNGN 320 | 9.525 | 3.18 | | | | | | | | | | | | | |
| | 090400 | 330 | 9.525 | 4.76 | | | | | | | | | | | | | |
| | 120300 | 420 | 12.7 | 3.18 | | | | | | | | | | | | | |
| | 120400 | 430 | 12.7 | 4.76 | | | | | | | | | | | | | |
| | 150400 | 530 | 15.875 | 4.76 | | | | | | | | | | | | | |

RCGW

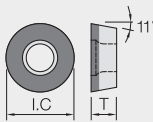
POSITIVE 7 _ hole

| RCGW | ISO code | | Dimensions (mm) | | | | PCD | | | | | | | CVD | | | |
|----------|--|----------|-----------------|------|---|------|------|------|------|------|-------|------|------|------|------|-------|-------|
| | Metric | Inch | I.C | T | R | Hole | EP10 | EP20 | EP13 | EP55 | EP750 | EP58 | EP59 | EP29 | ED20 | ED501 | ED502 |
| |  | | | | | | | | | | | | | | | | |
| Standard | RCGW 080300 | RCGW (-) | 8 | 3.18 | | | | | | | | | | | | | |
| | 090300 | 320 | 9.525 | 3.18 | | | | | | | | | | | | | |
| | 090400 | 330 | 9.525 | 4.76 | | | | | | | | | | | | | |
| | 120300 | 420 | 12.7 | 3.18 | | | | | | | | | | | | | |
| | 120400 | 430 | 12.7 | 4.76 | | | | | | | | | | | | | |

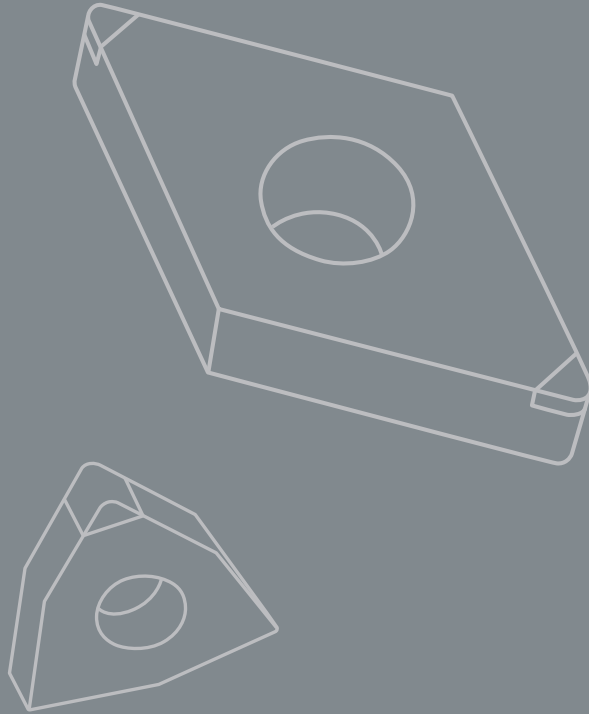
Holder : 68p

RPGW

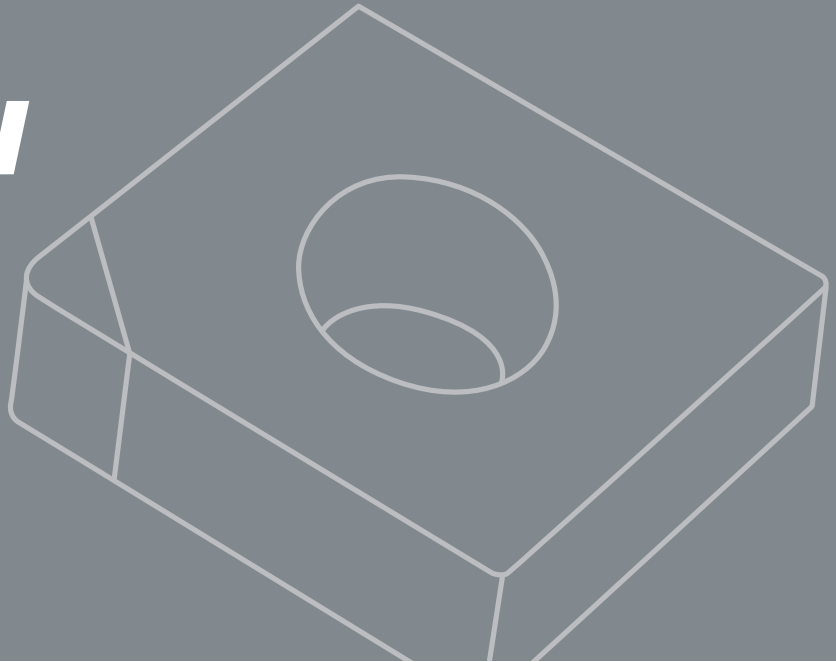
POSITIVE 11 _ hole

| RPGW | ISO code | | Dimensions (mm) | | | | PCD | | | | | | | CVD | | | |
|----------|---|----------|-----------------|------|---|------|------|------|------|------|-------|------|------|------|------|-------|-------|
| | Metric | Inch | I.C | T | R | Hole | EP10 | EP20 | EP13 | EP55 | EP750 | EP58 | EP59 | EP29 | ED20 | ED501 | ED502 |
| |  | | | | | | | | | | | | | | | | |
| Standard | RPGW 080300 | RPGW (-) | 8 | 3.18 | | | | | | | | | | | | | |
| | 120300 | 420 | 12.7 | 3.18 | | | | | | | | | | | | | |
| | 120400 | 430 | 12.7 | 4.76 | | | | | | | | | | | | | |

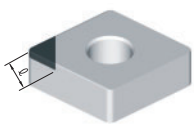
Holder : 68p



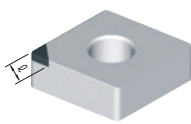
Turning_
PCBN



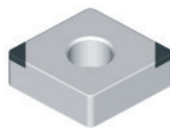
Insert tip types



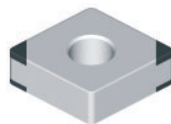
Standard



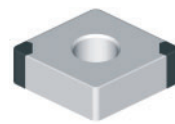
Mini tip



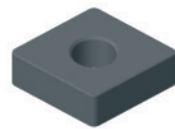
Mini 2tips



Mini 4tips



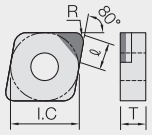
Vertical tip



Solid

CNGA

NEGATIVE hole

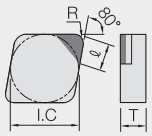
| CNGA | ISO code | | | | Dimensions (mm) | | | | | PCBN | | | | | | | | | | | | | | |
|---|-------------|--------------|--------------|------|-----------------|------|------|------|-----|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|--------|--|
| | Metric | | Inch | | I.C | T | R | Hole | φ | EB28X | EB580 | EB570 | EB160 | EB550 | EB150 | EB29X | EB290 | EB170 | EB51 | EB710 | EB120 | EB210 | EB100X | |
| | | | | | | | | | | | | | | | | | | | | | | | | |
|  | Standard | CNGA 120402 | CNGA 43(0.5) | 12.7 | 4.76 | 0.2 | 5.16 | 4.3 | | | | | | | | | | | | | | | | |
| | | | 120404 | 431 | 12.7 | 4.76 | 0.4 | 5.16 | 4.3 | | | | | | | | | | | | | | | |
| | | | 120408 | 432 | 12.7 | 4.76 | 0.8 | 5.16 | 4.2 | | | | | | | | | | | | | | | |
| | | | 120412 | 433 | 12.7 | 4.76 | 1.2 | 5.16 | 4.1 | | | | | | | | | | | | | | | |
| | MT | CNGA 120402 | CNGA 43(0.5) | 12.7 | 4.76 | 0.2 | 5.16 | 2.8 | | | | | | | | | | | | | | | | |
| | | | 120404 | 431 | 12.7 | 4.76 | 0.4 | 5.16 | 2.8 | | | | | | | | | | | | | | | |
| | | | 120408 | 432 | 12.7 | 4.76 | 0.8 | 5.16 | 2.7 | | | | | | | | | | | | | | | |
| | | | 120412 | 433 | 12.7 | 4.76 | 1.2 | 5.16 | 3.1 | | | | | | | | | | | | | | | |
| | 2MT | CNGA 120402 | CNGA 43(0.5) | 12.7 | 4.76 | 0.2 | 5.16 | 2.8 | | | | | | | | | | | | | | | | |
| | | | 120404 | 431 | 12.7 | 4.76 | 0.4 | 5.16 | 2.8 | | | | | | | | | | | | | | | |
| | | | 120408 | 432 | 12.7 | 4.76 | 0.8 | 5.16 | 2.7 | | | | | | | | | | | | | | | |
| | | | 120412 | 433 | 12.7 | 4.76 | 1.2 | 5.16 | 3.1 | | | | | | | | | | | | | | | |
| 4MT | CNGA 120402 | CNGA 43(0.5) | 12.7 | 4.76 | 0.2 | 5.16 | 2.8 | | | | | | | | | | | | | | | | | |
| | | 120404 | 431 | 12.7 | 4.76 | 0.4 | 5.16 | 2.8 | | | | | | | | | | | | | | | | |
| | | 120408 | 432 | 12.7 | 4.76 | 0.8 | 5.16 | 2.7 | | | | | | | | | | | | | | | | |
| | | 120412 | 433 | 12.7 | 4.76 | 1.2 | 5.16 | 3.1 | | | | | | | | | | | | | | | | |
| 4VT | CNGA 120402 | CNGA 43(0.5) | 12.7 | 4.76 | 0.2 | 5.16 | 2.7 | | | | | | | | | | | | | | | | | |
| | | 120404 | 431 | 12.7 | 4.76 | 0.4 | 5.16 | 2.6 | | | | | | | | | | | | | | | | |
| | | 120408 | 432 | 12.7 | 4.76 | 0.8 | 5.16 | 2.5 | | | | | | | | | | | | | | | | |
| | | 120412 | 433 | 12.7 | 4.76 | 1.2 | 5.16 | 2.5 | | | | | | | | | | | | | | | | |

■ MT : Mini Tip 2MT : Mini 2Tips 4MT : Mini 4Tips 4VT : Vertical 4Tips

Holder : 53p, 57p, 60p, 61p

CNGN

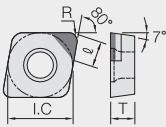
NEGATIVE

| CNGN | ISO code | | | | Dimensions (mm) | | | | | PCBN | | | | | | | | | | | | | | |
|---|----------|-------------|----------|------|-----------------|------|-----|------|-----|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|--------|--|
| | Metric | | Inch | | I.C | T | R | Hole | φ | EB28X | EB580 | EB570 | EB160 | EB550 | EB150 | EB29X | EB290 | EB170 | EB51 | EB710 | EB120 | EB210 | EB100X | |
| | | | | | | | | | | | | | | | | | | | | | | | | |
|  | Standard | CNGN 120408 | CNGN 432 | 12.7 | 4.76 | 0.8 | | 4.2 | | | | | | | | | | | | | | | | |
| | | | 120412 | 433 | 12.7 | 4.76 | 1.2 | | 4.1 | | | | | | | | | | | | | | | |
| | Solid | CNGN 120408 | CNGN 432 | 12.7 | 4.76 | 0.8 | | | | | | | | | | | | | | | | | | |
| | | | 120412 | 433 | 12.7 | 4.76 | 1.2 | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | |

CCGW

POSITIVE 7 _ hole

| CCGW | | ISO code | | Dimensions (mm) | | | | PCBN | | | | | | | | | | | | | | | |
|----------|------|----------|--------------|-----------------|-------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|--------|--|
| | | Metric | Inch | I.C | T | R | Hole | φ | EB28X | EB580 | EB570 | EB160 | EB550 | EB150 | EB29X | EB290 | EB170 | EB51 | EB710 | EB120 | EB210 | EB100X | |
| Standard | CCGW | 060208 | CCGW 2(1.5)2 | 6.35 | 2.38 | 0.8 | 2.8 | 3.2 | | | | | | | | | | | | | | | |
| | | 09T302 | 3(2.5)0.5 | 9.525 | 3.97 | 0.2 | 4.4 | 4.3 | | | | | | | | | | | | | | | |
| | | 09T304 | 3(2.5)1 | 9.525 | 3.97 | 0.4 | 4.4 | 4.3 | | | | | | | | | | | | | | | |
| | | 09T308 | 3(2.5)2 | 9.525 | 3.97 | 0.8 | 4.4 | 4.2 | | | | | | | | | | | | | | | |
| | | 120402 | 430 | 12.7 | 4.76 | 0.2 | 5.5 | 4.3 | | | | | | | | | | | | | | | |
| | | 120404 | 431 | 12.7 | 4.76 | 0.4 | 5.5 | 4.3 | | | | | | | | | | | | | | | |
| | | 120408 | 432 | 12.7 | 4.76 | 0.8 | 5.5 | 4.2 | | | | | | | | | | | | | | | |
| | | 120412 | 433 | 12.7 | 4.76 | 1.2 | 5.5 | 4.1 | | | | | | | | | | | | | | | |
| | MT | CCGW | 060202 | CCGW 2(1.5)0.5 | 6.35 | 2.38 | 0.2 | 2.8 | 2.8 | | | | | | | | | | | | | | |
| | | | 060204 | 2(1.5)1 | 6.35 | 2.38 | 0.4 | 2.8 | 2.8 | | | | | | | | | | | | | | |
| | | | 060208 | 2(1.5)2 | 6.35 | 2.38 | 0.8 | 2.8 | 2.7 | | | | | | | | | | | | | | |
| | | | 09T302 | 3(2.5)0.5 | 9.525 | 3.97 | 0.2 | 4.4 | 2.8 | | | | | | | | | | | | | | |
| | | 09T304 | 3(2.5)1 | 9.525 | 3.97 | 0.4 | 4.4 | 2.8 | | | | | | | | | | | | | | | |
| | | 09T308 | 3(2.5)2 | 9.525 | 3.97 | 0.8 | 4.4 | 2.7 | | | | | | | | | | | | | | | |
| | | 120402 | 430 | 12.7 | 4.76 | 0.2 | 5.5 | 2.8 | | | | | | | | | | | | | | | |
| | | 120404 | 431 | 12.7 | 4.76 | 0.4 | 5.5 | 2.8 | | | | | | | | | | | | | | | |
| | | 120408 | 432 | 12.7 | 4.76 | 0.8 | 5.5 | 2.7 | | | | | | | | | | | | | | | |
| | | 120412 | 433 | 12.7 | 4.76 | 1.2 | 5.5 | 3.1 | | | | | | | | | | | | | | | |
| 2MT | | CCGW | 060202 | CCGW 2(1.5)0.5 | 6.35 | 2.38 | 0.2 | 2.8 | 2.8 | | | | | | | | | | | | | | |
| | | | 060204 | 2(1.5)1 | 6.35 | 2.38 | 0.4 | 2.8 | 2.8 | | | | | | | | | | | | | | |
| | | 060208 | 2(1.5)2 | 6.35 | 2.38 | 0.8 | 2.8 | 2.7 | | | | | | | | | | | | | | | |
| | | 09T302 | 3(2.5)0.5 | 9.525 | 3.97 | 0.2 | 4.4 | 2.8 | | | | | | | | | | | | | | | |
| | | 09T304 | 3(2.5)1 | 9.525 | 3.97 | 0.4 | 4.4 | 2.8 | | | | | | | | | | | | | | | |
| | | 09T308 | 3(2.5)2 | 9.525 | 3.97 | 0.8 | 4.4 | 2.7 | | | | | | | | | | | | | | | |
| | | 120402 | 430 | 12.7 | 4.76 | 0.2 | 5.5 | 2.8 | | | | | | | | | | | | | | | |
| | | 120404 | 431 | 12.7 | 4.76 | 0.4 | 5.5 | 2.8 | | | | | | | | | | | | | | | |
| | | 120408 | 432 | 12.7 | 4.76 | 0.8 | 5.5 | 2.7 | | | | | | | | | | | | | | | |
| | | 120412 | 433 | 12.7 | 4.76 | 1.2 | 5.5 | 3.1 | | | | | | | | | | | | | | | |



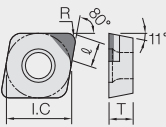
■ MT : Mini Tips 2MT : Mini 2Tips

Holder : 66p

CPGW

POSITIVE 11 _ hole

| CPGW | | ISO code | | Dimensions (mm) | | | | PCBN | | | | | | | | | | | | | | |
|----------|------|----------|------------|------------------|-------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|--------|
| | | Metric | Inch | I.C | T | R | Hole | φ | EB28X | EB580 | EB570 | EB160 | EB550 | EB150 | EB29X | EB290 | EB170 | EB51 | EB710 | EB120 | EB210 | EB100X |
| Standard | CPGW | 090302 | CPGW 320.5 | 9.525 | 3.18 | 0.2 | 4.4 | 4.3 | | | | | | | | | | | | | | |
| | | 090304 | 321 | 9.525 | 3.18 | 0.4 | 4.4 | 4.3 | | | | | | | | | | | | | | |
| | | 090308 | 322 | 9.525 | 3.18 | 0.8 | 4.4 | 4.2 | | | | | | | | | | | | | | |
| | | CPGW | 080202 | CPGW 2.5(1.5)0.5 | 7.94 | 2.38 | 0.2 | 3.4 | 2.8 | | | | | | | | | | | | | |
| | | 080204 | 2.5(1.5)1 | 7.94 | 2.38 | 0.4 | 3.4 | 2.8 | | | | | | | | | | | | | | |
| | | 090302 | 320.5 | 9.525 | 3.18 | 0.2 | 4.4 | 2.8 | | | | | | | | | | | | | | |
| MT | | 090304 | 321 | 9.525 | 3.18 | 0.4 | 4.4 | 2.8 | | | | | | | | | | | | | | |
| | | 090308 | 322 | 9.525 | 3.18 | 0.8 | 4.4 | 2.7 | | | | | | | | | | | | | | |
| | 2MT | CPGW | 080202 | CPGW 2.5(1.5)0.5 | 7.94 | 2.38 | 0.2 | 3.4 | 2.8 | | | | | | | | | | | | | |
| | | | 080204 | 2.5(1.5)1 | 7.94 | 2.38 | 0.4 | 3.4 | 2.8 | | | | | | | | | | | | | |
| | | | 090302 | 320.5 | 9.525 | 3.18 | 0.2 | 4.4 | 2.8 | | | | | | | | | | | | | |
| | | | 090304 | 321 | 9.525 | 3.18 | 0.4 | 4.4 | 2.8 | | | | | | | | | | | | | |
| | | 090308 | 322 | 9.525 | 3.18 | 0.8 | 4.4 | 2.7 | | | | | | | | | | | | | | |

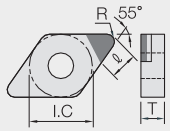


■ MT : Mini Tips 2MT : Mini 2Tips

DNGA

NEGATIVE hole

| DNGA | ISO code | | Dimensions (mm) | | | | | | PCBN | | | | | | | | | | | | | | |
|----------|----------|--------|-----------------|------|-------|-------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|--------|--|--|
| | Metric | Inch | I.C | T | R | Hole | ℓ | EB28X | EB680 | EB570 | EB160 | EB550 | EB150 | EB29X | EB290 | EB170 | EB51 | EB710 | EB120 | EB210 | EB100X | | |
| | | | | | | | | | | | | | | | | | | | | | | | |
| Standard | DNGA | 110404 | DNGA | 331 | 9.525 | 4.76 | 0.4 | 3.81 | 3.9 | | | | | | | | | | | | | | |
| | | 110408 | | 332 | 9.525 | 4.76 | 0.8 | 3.81 | 3.5 | | | | | | | | | | | | | | |
| | | 150404 | | 431 | 12.7 | 4.76 | 0.4 | 5.16 | 3.9 | | | | | | | | | | | | | | |
| | | 150408 | | 432 | 12.7 | 4.76 | 0.8 | 5.16 | 3.5 | | | | | | | | | | | | | | |
| | | 150412 | | 433 | 12.7 | 4.76 | 1.2 | 5.16 | 3.1 | | | | | | | | | | | | | | |
| | | 150604 | | 441 | 12.7 | 6.35 | 0.4 | 5.16 | 3.9 | | | | | | | | | | | | | | |
| | | 150608 | | 442 | 12.7 | 6.35 | 0.8 | 5.16 | 3.5 | | | | | | | | | | | | | | |
| | | 150612 | | 443 | 12.7 | 6.35 | 1.2 | 5.16 | 3.1 | | | | | | | | | | | | | | |
| | MT | DNGA | 110404 | DNGA | 331 | 9.525 | 4.76 | 0.4 | 3.81 | 2.4 | | | | | | | | | | | | | |
| | | | 110408 | | 332 | 9.525 | 4.76 | 0.8 | 3.81 | 2 | | | | | | | | | | | | | |
| | | | 150404 | | 431 | 12.7 | 4.76 | 0.4 | 5.16 | 2.4 | | | | | | | | | | | | | |
| | | | 150408 | | 432 | 12.7 | 4.76 | 0.8 | 5.16 | 2 | | | | | | | | | | | | | |
| | | 150412 | | 433 | 12.7 | 4.76 | 1.2 | 5.16 | 2.1 | | | | | | | | | | | | | | |
| | | 150604 | | 441 | 12.7 | 6.35 | 0.4 | 5.16 | 2.4 | | | | | | | | | | | | | | |
| | | 150608 | | 442 | 12.7 | 6.35 | 0.8 | 5.16 | 2 | | | | | | | | | | | | | | |
| | | 150612 | | 443 | 12.7 | 6.35 | 1.2 | 5.16 | 2.1 | | | | | | | | | | | | | | |
| 2MT | DNGA | 110404 | DNGA | 331 | 9.525 | 4.76 | 0.4 | 3.81 | 2.4 | | | | | | | | | | | | | | |
| | | 110408 | | 332 | 9.525 | 4.76 | 0.8 | 3.81 | 2 | | | | | | | | | | | | | | |
| | | 150404 | | 431 | 12.7 | 4.76 | 0.4 | 5.16 | 2.4 | | | | | | | | | | | | | | |
| | | 150408 | | 432 | 12.7 | 4.76 | 0.8 | 5.16 | 2 | | | | | | | | | | | | | | |
| | | 150412 | | 433 | 12.7 | 4.76 | 1.2 | 5.16 | 2.1 | | | | | | | | | | | | | | |
| | | 150604 | | 441 | 12.7 | 6.35 | 0.4 | 5.16 | 2.4 | | | | | | | | | | | | | | |
| | | 150608 | | 442 | 12.7 | 6.35 | 0.8 | 5.16 | 2 | | | | | | | | | | | | | | |
| | | 150612 | | 443 | 12.7 | 6.35 | 1.2 | 5.16 | 2.1 | | | | | | | | | | | | | | |
| 4MT | DNGA | 110404 | DNGA | 331 | 9.525 | 4.76 | 0.4 | 3.81 | 2.4 | | | | | | | | | | | | | | |
| | | 110408 | | 332 | 9.525 | 4.76 | 0.8 | 3.81 | 2 | | | | | | | | | | | | | | |
| | | 150404 | | 431 | 12.7 | 4.76 | 0.4 | 5.16 | 2.4 | | | | | | | | | | | | | | |
| | | 150408 | | 432 | 12.7 | 4.76 | 0.8 | 5.16 | 2 | | | | | | | | | | | | | | |
| | | 150412 | | 433 | 12.7 | 4.76 | 1.2 | 5.16 | 2.1 | | | | | | | | | | | | | | |
| | | 150604 | | 441 | 12.7 | 6.35 | 0.4 | 5.16 | 2.4 | | | | | | | | | | | | | | |
| | | 150608 | | 442 | 12.7 | 6.35 | 0.8 | 5.16 | 2 | | | | | | | | | | | | | | |
| | | 150612 | | 443 | 12.7 | 6.35 | 1.2 | 5.16 | 2.1 | | | | | | | | | | | | | | |
| 4VT | DNGA | 110404 | DNGA | 331 | 9.525 | 4.76 | 0.4 | 3.81 | 2.7 | | | | | | | | | | | | | | |
| | | 110408 | | 332 | 9.525 | 4.76 | 0.8 | 3.81 | 2.3 | | | | | | | | | | | | | | |
| | | 150404 | | 431 | 12.7 | 4.76 | 0.4 | 5.16 | 2.7 | | | | | | | | | | | | | | |
| | | 150408 | | 432 | 12.7 | 4.76 | 0.8 | 5.16 | 2.3 | | | | | | | | | | | | | | |
| | | 150412 | | 433 | 12.7 | 4.76 | 1.2 | 5.16 | 2 | | | | | | | | | | | | | | |



■ MT : Mini Tips 2MT : Mini 2Tips 4MT : Mini 4Tips 4VT : Vertical 4Tips

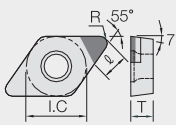
Holder : 53p, 57p, 58p, 61p, 62p

DCGW

POSITIVE 7 _ hole

Turning

| DCGW | | ISO code | | Dimensions (mm) | | | | | PCBN | | | | | | | | | | | | | | |
|----------|------|----------|----------------|-----------------|------|-----|------|-----|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|--------|--|
| | | Metric | Inch | I.C | T | R | Hole | φ | EB28X | EB580 | EB570 | EB160 | EB550 | EB150 | EB29X | EB290 | EB170 | EB51 | EB710 | EB120 | EB210 | EB100X | |
| Standard | DCGW | 11T302 | DCGW 3(2.5)0.5 | 9.525 | 3.97 | 0.4 | 4.4 | 4 | | | | | | | | | | | | | | | |
| | | 11T304 | 3(2.5)1 | 9.525 | 3.97 | 0.4 | 4.4 | 3.9 | | | | | | | | | | | | | | | |
| | | 11T308 | 3(2.5)2 | 9.525 | 3.97 | 0.8 | 4.4 | 3.5 | | | | | | | | | | | | | | | |
| | | 150404 | 431 | 12.7 | 4.76 | 0.4 | 5.16 | 3.9 | | | | | | | | | | | | | | | |
| | | 150408 | 432 | 12.7 | 4.76 | 0.8 | 5.16 | 3.5 | | | | | | | | | | | | | | | |
| MT | DCGW | 11T302 | DCGW 3(2.5)0.5 | 9.525 | 3.97 | 0.4 | 4.4 | 2.5 | | | | | | | | | | | | | | | |
| | | 11T304 | 3(2.5)1 | 9.525 | 3.97 | 0.4 | 4.4 | 2.4 | | | | | | | | | | | | | | | |
| | | 11T308 | 3(2.5)2 | 9.525 | 3.97 | 0.8 | 4.4 | 2 | | | | | | | | | | | | | | | |
| | | 150404 | 431 | 12.7 | 4.76 | 0.4 | 5.16 | 2.4 | | | | | | | | | | | | | | | |
| | | 150408 | 432 | 12.7 | 4.76 | 0.8 | 5.16 | 2 | | | | | | | | | | | | | | | |
| 2MT | DCGW | 11T302 | DCGW 3(2.5)0.5 | 9.525 | 3.97 | 0.4 | 4.4 | 2.5 | | | | | | | | | | | | | | | |
| | | 11T304 | 3(2.5)1 | 9.525 | 3.97 | 0.4 | 4.4 | 2.4 | | | | | | | | | | | | | | | |
| | | 11T308 | 3(2.5)2 | 9.525 | 3.97 | 0.8 | 4.4 | 2 | | | | | | | | | | | | | | | |
| | | 150404 | 431 | 12.7 | 4.76 | 0.4 | 5.16 | 2.4 | | | | | | | | | | | | | | | |
| | | 150408 | 432 | 12.7 | 4.76 | 0.8 | 5.16 | 2 | | | | | | | | | | | | | | | |



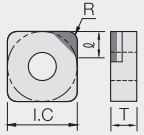
■ MT : Mini Tips 2MT : Mini 2Tips

Holder : 67p

SNGA

NEGATIVE _ hole

| SNGA | | ISO code | | Dimensions (mm) | | | | | PCBN | | | | | | | | | | | | | | |
|----------|------|----------|----------|-----------------|------|-----|------|-----|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|--------|--|
| | | Metric | Inch | I.C | T | R | Hole | φ | EB28X | EB580 | EB570 | EB160 | EB550 | EB150 | EB29X | EB290 | EB170 | EB51 | EB710 | EB120 | EB210 | EB100X | |
| Standard | SNGA | 090304 | SNGA 321 | 9.525 | 3.18 | 0.4 | 3.81 | 4.4 | | | | | | | | | | | | | | | |
| | | 090308 | 322 | 9.525 | 3.18 | 0.8 | 3.81 | 4.4 | | | | | | | | | | | | | | | |
| | | 120404 | 431 | 12.7 | 4.76 | 0.4 | 5.16 | 4.4 | | | | | | | | | | | | | | | |
| | | 120408 | 432 | 12.7 | 4.76 | 0.8 | 5.16 | 4.4 | | | | | | | | | | | | | | | |
| | | 120412 | 433 | 12.7 | 4.76 | 1.2 | 5.16 | 4.4 | | | | | | | | | | | | | | | |
| MT | SNGA | 090304 | SNGA 321 | 9.525 | 3.18 | 0.4 | 3.81 | 2.9 | | | | | | | | | | | | | | | |
| | | 090308 | 322 | 9.525 | 3.18 | 0.8 | 3.81 | 2.9 | | | | | | | | | | | | | | | |
| | | 120404 | 431 | 12.7 | 4.76 | 0.4 | 5.16 | 2.9 | | | | | | | | | | | | | | | |
| | | 120408 | 432 | 12.7 | 4.76 | 0.8 | 5.16 | 2.9 | | | | | | | | | | | | | | | |
| | | 120412 | 433 | 12.7 | 4.76 | 1.2 | 5.16 | 3.4 | | | | | | | | | | | | | | | |
| 2MT | SNGA | 090304 | SNGA 321 | 9.525 | 3.18 | 0.4 | 3.81 | 2.9 | | | | | | | | | | | | | | | |
| | | 090308 | 322 | 9.525 | 3.18 | 0.8 | 3.81 | 2.9 | | | | | | | | | | | | | | | |
| | | 120404 | 431 | 12.7 | 4.76 | 0.4 | 5.16 | 2.9 | | | | | | | | | | | | | | | |
| | | 120408 | 432 | 12.7 | 4.76 | 0.8 | 5.16 | 2.9 | | | | | | | | | | | | | | | |
| | | 120412 | 433 | 12.7 | 4.76 | 1.2 | 5.16 | 3.4 | | | | | | | | | | | | | | | |
| 4MT | SNGA | 120404 | SNGA 431 | 12.7 | 4.76 | 0.4 | 5.16 | 2.9 | | | | | | | | | | | | | | | |
| | | 120408 | 432 | 12.7 | 4.76 | 0.8 | 5.16 | 2.9 | | | | | | | | | | | | | | | |
| | | 120412 | 433 | 12.7 | 4.76 | 1.2 | 5.16 | 3.4 | | | | | | | | | | | | | | | |
| 8VT | SNGA | 120404 | SNGA 431 | 12.7 | 4.76 | 0.4 | 5.16 | 2.2 | | | | | | | | | | | | | | | |
| | | 120408 | 432 | 12.7 | 4.76 | 0.8 | 5.16 | 2.2 | | | | | | | | | | | | | | | |
| | | 120412 | 433 | 12.7 | 4.76 | 1.2 | 5.16 | 2.2 | | | | | | | | | | | | | | | |



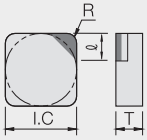
■ MT : Mini Tips 2MT : Mini 2Tips 4MT : Mini 4Tips 8VT : Vertical 8Tips

Holder : 54p, 55p, 58p, 59p, 62p, 63p

SNGN

NEGATIVE

| SNGN | ISO code | | Dimensions (mm) | | | | | | PCBN | | | | | | | | | | | | | | |
|----------|----------|--------|-----------------|------|-------|-------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|--------|--|--|
| | Metric | Inch | I.C | T | R | Hole | φ | EB28X | EB580 | EB570 | EB160 | EB550 | EB150 | EB29X | EB290 | EB170 | EB51 | EB710 | EB120 | EB210 | EB100X | | |
| | | | | | | | | | | | | | | | | | | | | | | | |
| Standard | SNGN | 090304 | SNGN | 321 | 9.525 | 3.18 | 0.4 | | 4.4 | | | | | | | | | | | | | | |
| | | 090308 | | 322 | 9.525 | 3.18 | 0.8 | | 4.4 | | | | | | | | | | | | | | |
| | | 120404 | | 431 | 12.7 | 4.76 | 0.4 | | 4.4 | | | | | | | | | | | | | | |
| | | 120408 | | 432 | 12.7 | 4.76 | 0.8 | | 4.4 | | | | | | | | | | | | | | |
| | | 120412 | | 433 | 12.7 | 4.76 | 1.2 | | 4.4 | | | | | | | | | | | | | | |
| | MT | SNGN | 090304 | SNGN | 321 | 9.525 | 3.18 | 0.4 | | 2.9 | | | | | | | | | | | | | |
| | | | 090308 | | 322 | 9.525 | 3.18 | 0.8 | | 2.9 | | | | | | | | | | | | | |
| | | | 120404 | | 431 | 12.7 | 4.76 | 0.4 | | 2.9 | | | | | | | | | | | | | |
| | | | 120408 | | 432 | 12.7 | 4.76 | 0.8 | | 2.9 | | | | | | | | | | | | | |
| | | | 120412 | | 433 | 12.7 | 4.76 | 1.2 | | 3.4 | | | | | | | | | | | | | |
| | 2MT | SNGN | 090304 | SNGN | 321 | 9.525 | 3.18 | 0.4 | | 2.9 | | | | | | | | | | | | | |
| | | | 090308 | | 322 | 9.525 | 3.18 | 0.8 | | 2.9 | | | | | | | | | | | | | |
| | | 120404 | | 431 | 12.7 | 4.76 | 0.4 | | 2.9 | | | | | | | | | | | | | | |
| | | 120408 | | 432 | 12.7 | 4.76 | 0.8 | | 2.9 | | | | | | | | | | | | | | |
| | | 120412 | | 433 | 12.7 | 4.76 | 1.2 | | 3.4 | | | | | | | | | | | | | | |
| 4MT | SNGN | 120404 | SNGN | 431 | 12.7 | 4.76 | 0.4 | | 2.9 | | | | | | | | | | | | | | |
| | | 120408 | | 432 | 12.7 | 4.76 | 0.8 | | 2.9 | | | | | | | | | | | | | | |
| | | 120412 | | 433 | 12.7 | 4.76 | 1.2 | | 3.4 | | | | | | | | | | | | | | |
| 8VT | SNGN | 120404 | SNGN | 431 | 12.7 | 4.76 | 0.4 | | 2.2 | | | | | | | | | | | | | | |
| | | 120408 | | 432 | 12.7 | 4.76 | 0.8 | | 2.2 | | | | | | | | | | | | | | |
| | | 120412 | | 433 | 12.7 | 4.76 | 1.2 | | 2.2 | | | | | | | | | | | | | | |
| Solid | SNGN | 090304 | SNGN | 321 | 9.525 | 3.18 | 0.4 | | | | | | | | | | | | | | | | |
| | | 090308 | | 322 | 9.525 | 3.18 | 0.8 | | | | | | | | | | | | | | | | |
| | | 120404 | | 431 | 12.7 | 4.76 | 0.4 | | | | | | | | | | | | | | | | |
| | | 120408 | | 432 | 12.7 | 4.76 | 0.8 | | | | | | | | | | | | | | | | |
| | | 120412 | | 433 | 12.7 | 4.76 | 1.2 | | | | | | | | | | | | | | | | |



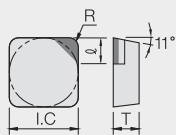
■ MT : Mini Tips 2MT : Mini 2Tips 4MT : Mini 4Tips 8VT : Vertical 8Tips

Holder : 54p, 55p, 58p, 59p, 62p, 63p

SPGN

POSITIVE 11

| SPGN | ISO code | | Dimensions (mm) | | | | | PCBN | | | | | | | | | | | | | | |
|-----------|-------------|----------|-----------------|------|-----|------|-----|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|--------|--|
| | Metric | Inch | I.C | T | R | Hole | φ | EB28X | EB580 | EB570 | EB160 | EB550 | EB150 | EB29X | EB290 | EB170 | EB51 | EB710 | EB120 | EB210 | EB100X | |
| | | | | | | | | | | | | | | | | | | | | | | |
| Standard | SPGN 090304 | SPGN 321 | 9.525 | 3.18 | 0.4 | | 4.4 | | | | | | | | | | | | | | | |
| | 090308 | 322 | 9.525 | 3.18 | 0.8 | | 4.4 | | | | | | | | | | | | | | | |
| | 120404 | 431 | 12.7 | 4.76 | 0.4 | | 4.4 | | | | | | | | | | | | | | | |
| | 120408 | 432 | 12.7 | 4.76 | 0.8 | | 4.4 | | | | | | | | | | | | | | | |
| | 120412 | 433 | 12.7 | 4.76 | 1.2 | | 4.4 | | | | | | | | | | | | | | | |
| MT | SPGN 090304 | SPGN 321 | 9.525 | 3.18 | 0.4 | | 2.9 | | | | | | | | | | | | | | | |
| | 090308 | 322 | 9.525 | 3.18 | 0.8 | | 2.9 | | | | | | | | | | | | | | | |
| | 120404 | 431 | 12.7 | 4.76 | 0.4 | | 2.9 | | | | | | | | | | | | | | | |
| | 120408 | 432 | 12.7 | 4.76 | 0.8 | | 2.9 | | | | | | | | | | | | | | | |
| | 120412 | 433 | 12.7 | 4.76 | 1.2 | | 3.4 | | | | | | | | | | | | | | | |
| 2MT | SPGN 090304 | SPGN 321 | 9.525 | 3.18 | 0.4 | | 2.9 | | | | | | | | | | | | | | | |
| | 090308 | 322 | 9.525 | 3.18 | 0.8 | | 2.9 | | | | | | | | | | | | | | | |
| | 120404 | 431 | 12.7 | 4.76 | 0.4 | | 2.9 | | | | | | | | | | | | | | | |
| | 120408 | 432 | 12.7 | 4.76 | 0.8 | | 2.9 | | | | | | | | | | | | | | | |
| | 120412 | 433 | 12.7 | 4.76 | 1.2 | | 3.4 | | | | | | | | | | | | | | | |
| 4MT | SPGN 120404 | SPGN 431 | 12.7 | 4.76 | 0.4 | | 2.9 | | | | | | | | | | | | | | | |
| | 120408 | 432 | 12.7 | 4.76 | 0.8 | | 2.9 | | | | | | | | | | | | | | | |
| | 120412 | 433 | 12.7 | 4.76 | 1.2 | | 3.4 | | | | | | | | | | | | | | | |
| Full face | SPGN 090304 | SPGN 321 | 9.525 | 3.18 | 0.4 | | | | | | | | | | | | | | | | | |
| | 090308 | 322 | 9.525 | 3.18 | 0.8 | | | | | | | | | | | | | | | | | |
| | 120404 | 431 | 12.7 | 4.76 | 0.4 | | | | | | | | | | | | | | | | | |
| | 120408 | 432 | 12.7 | 4.76 | 0.8 | | | | | | | | | | | | | | | | | |
| | 120412 | 433 | 12.7 | 4.76 | 1.2 | | | | | | | | | | | | | | | | | |

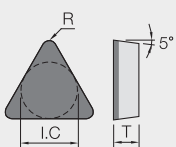


■ MT : Mini Tips 2MT : Mini 2Tips 4MT : Mini 4Tips

TBGN

POSITIVE 5

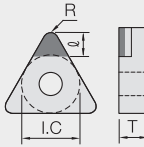
| TBGN | ISO code | | Dimensions (mm) | | | | | PCBN | | | | | | | | | | | | | | | |
|-----------|-------------|----------------|-----------------|------|-----|------|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|--------|--|--|
| | Metric | Inch | I.C | T | R | Hole | φ | EB28X | EB580 | EB570 | EB160 | EB550 | EB150 | EB29X | EB290 | EB170 | EB51 | EB710 | EB120 | EB210 | EB100X | | |
| | | | | | | | | | | | | | | | | | | | | | | | |
| Full face | TBGN 060102 | TBGN (1.2)10.5 | 3.97 | 1.59 | 0.2 | | | | | | | | | | | | | | | | | | |
| | 060104 | (1.2)11 | 3.97 | 1.59 | 0.4 | | | | | | | | | | | | | | | | | | |
| | 060108 | (1.2)12 | 3.97 | 1.59 | 0.8 | | | | | | | | | | | | | | | | | | |
| | 080202 | 1.5(1.5)0.5 | 4.76 | 2.38 | 0.2 | | | | | | | | | | | | | | | | | | |
| | 080204 | 1.5(1.5)1 | 4.76 | 2.38 | 0.4 | | | | | | | | | | | | | | | | | | |
| | 080208 | 1.5(1.5)2 | 4.76 | 2.38 | 0.8 | | | | | | | | | | | | | | | | | | |
| | 080212 | 1.5(1.5)3 | 4.76 | 2.38 | 1.2 | | | | | | | | | | | | | | | | | | |





TNGA

NEGATIVE _ hole

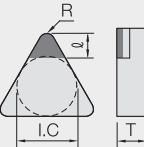
| TNGA | | ISO code | | Dimensions (mm) | | | | | PCBN | | | | | | | | | | | | | | | | | |
|---|-----------|----------|--------|-----------------|-----|-------|------|-----|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|--------|--|--|--|--|
| | | Metric | Inch | I.C | T | R | Hole | φ | EB28X | EB580 | EB570 | EB160 | EB550 | EB150 | EB29X | EB290 | EB170 | EB51 | EB710 | EB120 | EB210 | EB100X | | | | |
|  | Standard | TNGA | 110304 | TNGA | 221 | 6.35 | 3.18 | 0.4 | 2.4 | 4 | | | | | | | | | | | | | | | | |
| | | | 160404 | | 331 | 9.525 | 4.76 | 0.4 | 3.81 | 4 | | | | | | | | | | | | | | | | |
| | | | 160408 | | 332 | 9.525 | 4.76 | 0.8 | 3.81 | 3.7 | | | | | | | | | | | | | | | | |
| | | | 220404 | | 431 | 12.7 | 4.76 | 0.4 | 5.16 | 4 | | | | | | | | | | | | | | | | |
| | | | 220408 | | 432 | 12.7 | 4.76 | 0.8 | 5.16 | 3.7 | | | | | | | | | | | | | | | | |
| | MT | TNGA | 110304 | TNGA | 221 | 6.35 | 3.18 | 0.4 | 2.4 | 2.5 | | | | | | | | | | | | | | | | |
| | | | 160404 | | 331 | 9.525 | 4.76 | 0.8 | 3.81 | 2.5 | | | | | | | | | | | | | | | | |
| | | | 160408 | | 332 | 9.525 | 4.76 | 0.4 | 3.81 | 2.2 | | | | | | | | | | | | | | | | |
| | 3MT | TNGA | 110304 | TNGA | 221 | 6.35 | 3.18 | 0.4 | 2.4 | 2.5 | | | | | | | | | | | | | | | | |
| | | | 160404 | | 331 | 9.525 | 4.76 | 0.4 | 3.81 | 2.5 | | | | | | | | | | | | | | | | |
| | | | 160408 | | 332 | 9.525 | 4.76 | 0.8 | 3.81 | 2.2 | | | | | | | | | | | | | | | | |
| | | | 220404 | | 431 | 12.7 | 4.76 | 0.4 | 5.16 | 2.5 | | | | | | | | | | | | | | | | |
| | 6VT Solid | | 220408 | | 432 | 12.7 | 4.76 | 0.8 | 5.16 | 2.2 | | | | | | | | | | | | | | | | |
| | | TNGA | 160404 | TNGA | 331 | 9.525 | 4.76 | 0.4 | 3.81 | 2.9 | | | | | | | | | | | | | | | | |
| | | | 160408 | | 332 | 9.525 | 4.76 | 0.8 | 3.81 | 2.6 | | | | | | | | | | | | | | | | |

■ MT : Mini Tips 3MT : Mini 3Tips 6VT : Vertical 6Tips

Holder : 59p, 60p, 63p, 64p

TNGN

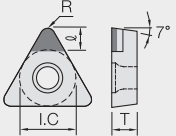
NEGATIVE

| TNGN | | ISO code | | Dimensions (mm) | | | | | PCBN | | | | | | | | | | | | | | | | | |
|---|-----------|----------|--------|-----------------|-----|-------|------|-----|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|--------|--|--|--|--|
| | | Metric | Inch | I.C | T | R | Hole | φ | EB28X | EB580 | EB570 | EB160 | EB550 | EB150 | EB29X | EB290 | EB170 | EB51 | EB710 | EB120 | EB210 | EB100X | | | | |
|  | Standard | TNGN | 160404 | TNGN | 331 | 9.525 | 4.76 | 0.4 | | 4 | | | | | | | | | | | | | | | | |
| | | | 160408 | | 332 | 9.525 | 4.76 | 0.8 | | 3.7 | | | | | | | | | | | | | | | | |
| | | | 160412 | | 333 | 9.525 | 4.76 | 1.2 | | 3.4 | | | | | | | | | | | | | | | | |
| | MT | TNGN | 160404 | TNGN | 331 | 9.525 | 4.76 | 0.4 | | 2.5 | | | | | | | | | | | | | | | | |
| | | | 160408 | | 332 | 9.525 | 4.76 | 0.8 | | 2.2 | | | | | | | | | | | | | | | | |
| | | | 160412 | | 333 | 9.525 | 4.76 | 1.2 | | 2.4 | | | | | | | | | | | | | | | | |
| | 3MT | TNGN | 160404 | TNGN | 331 | 9.525 | 4.76 | 0.4 | | 2.5 | | | | | | | | | | | | | | | | |
| | | | 160408 | | 332 | 9.525 | 4.76 | 0.8 | | 2.2 | | | | | | | | | | | | | | | | |
| | | | 160412 | | 333 | 9.525 | 4.76 | 1.2 | | 2.4 | | | | | | | | | | | | | | | | |
| | | | 220404 | | 431 | 12.7 | 4.76 | 0.4 | | 2.9 | | | | | | | | | | | | | | | | |
| | 6VT Solid | | 160408 | | 332 | 9.525 | 4.76 | 0.8 | | 2.6 | | | | | | | | | | | | | | | | |
| | | | 160412 | | 333 | 9.525 | 4.76 | 1.2 | | 2.3 | | | | | | | | | | | | | | | | |
| | | TNGN | 110304 | TNGN | 221 | 6.35 | 3.18 | 0.4 | | | | | | | | | | | | | | | | | | |
| | Solid | | 110308 | | 222 | 6.35 | 3.18 | 0.8 | | | | | | | | | | | | | | | | | | |
| | | | 160408 | | 332 | 9.525 | 4.76 | 0.8 | | | | | | | | | | | | | | | | | | |
| | | | 160412 | | 333 | 9.525 | 4.76 | 1.2 | | | | | | | | | | | | | | | | | | |

■ MT : Mini Tips 3MT : Mini 3Tips 6VT : Vertical 6Tips

TCGW

POSITIVE 7° hole

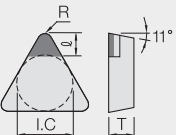
| TCGW | ISO code | | Dimensions (mm) | | | | | PCBN | | | | | | | | | | | | | | | |
|---|----------|-------------|-----------------|----------------|-------|------|-----|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|--------|--|--|
| | Metric | Inch | I.C | T | R | Hole | φ | EB28X | EB580 | EB570 | EB160 | EB550 | EB150 | EB29X | EB290 | EB170 | EB51 | EB710 | EB120 | EB210 | EB100X | | |
| | | | | | | | | | | | | | | | | | | | | | | | |
|  | Standard | TCGW 16T302 | TCGW 3(2.5)0.5 | 9.525 | 3.97 | 0.2 | 4.4 | 4.1 | | | | | | | | | | | | | | | |
| | | | 16T304 | 3(2.5)1 | 9.525 | 3.97 | 0.4 | 4.4 | 4 | | | | | | | | | | | | | | |
| | | | 16T308 | 3(2.5)2 | 9.525 | 3.97 | 0.8 | 4.4 | 3.7 | | | | | | | | | | | | | | |
| | MT | | TCGW 090202 | TCGW 2(1.5)0.5 | 5.56 | 2.38 | 0.2 | 2.5 | 2.6 | | | | | | | | | | | | | | |
| | | | 090204 | 2(1.5)1 | 5.56 | 2.38 | 0.4 | 2.5 | 2.5 | | | | | | | | | | | | | | |
| | | | 110202 | 2(1.5)0.5 | 6.35 | 2.38 | 0.2 | 2.8 | 2.6 | | | | | | | | | | | | | | |
| | | | 110204 | 2(1.5)1 | 6.35 | 2.38 | 0.4 | 2.8 | 2.5 | | | | | | | | | | | | | | |
| | | | 110208 | 2(1.5)2 | 6.35 | 2.38 | 0.8 | 2.8 | 2.2 | | | | | | | | | | | | | | |
| | | | 16T302 | 3(2.5)0.5 | 9.525 | 3.97 | 0.2 | 4.4 | 2.6 | | | | | | | | | | | | | | |
| | 3MT | | 16T304 | 3(2.5)1 | 9.525 | 3.97 | 0.4 | 4.4 | 2.5 | | | | | | | | | | | | | | |
| | | | 16T308 | 3(2.5)2 | 9.525 | 3.97 | 0.8 | 4.4 | 2.2 | | | | | | | | | | | | | | |
| | | | TCGW 090202 | TCGW 2(1.5)0.5 | 5.56 | 2.38 | 0.2 | 2.5 | 2.6 | | | | | | | | | | | | | | |
| | | 090204 | 2(1.5)1 | 5.56 | 2.38 | 0.4 | 2.5 | 2.5 | | | | | | | | | | | | | | | |
| | | 110202 | 2(1.5)0.5 | 6.35 | 2.38 | 0.2 | 2.8 | 2.6 | | | | | | | | | | | | | | | |
| | | 110204 | 2(1.5)1 | 6.35 | 2.38 | 0.4 | 2.8 | 2.5 | | | | | | | | | | | | | | | |

■ MT : Mini Tips 3MT : Mini 3Tips

Holder : 70p, 71p

TPGN

POSITIVE 11°

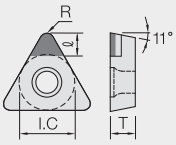
| TPGN | ISO code | | Dimensions (mm) | | | | | PCBN | | | | | | | | | | | | | | | |
|---|----------|-------------|-----------------|----------|-------|------|-----|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|--------|--|--|
| | Metric | Inch | I.C | T | R | Hole | φ | EB28X | EB580 | EB570 | EB160 | EB550 | EB150 | EB29X | EB290 | EB170 | EB51 | EB710 | EB120 | EB210 | EB100X | | |
| | | | | | | | | | | | | | | | | | | | | | | | |
|  | Standard | TPGN 160304 | TPGN 321 | 9.525 | 3.18 | 0.4 | | 4 | | | | | | | | | | | | | | | |
| | | | 160308 | 322 | 9.525 | 3.18 | 0.8 | | 3.7 | | | | | | | | | | | | | | |
| | | | 220404 | 431 | 12.7 | 4.76 | 0.4 | | 4 | | | | | | | | | | | | | | |
| | | | 220408 | 432 | 12.7 | 4.76 | 0.8 | | 3.7 | | | | | | | | | | | | | | |
| | MT | | TPGN 160304 | TPGN 321 | 9.525 | 3.18 | 0.4 | | 2.5 | | | | | | | | | | | | | | |
| | | | 160308 | 322 | 9.525 | 3.18 | 0.8 | | 2.2 | | | | | | | | | | | | | | |
| | 3MT | | TPGN 160304 | TPGN 321 | 9.525 | 3.18 | 0.4 | | 2.5 | | | | | | | | | | | | | | |
| | | | 160308 | 322 | 9.525 | 3.18 | 0.8 | | 2.2 | | | | | | | | | | | | | | |

■ MT : Mini Tips 3MT : Mini 3Tips

TPGW

POSITIVE 11° hole

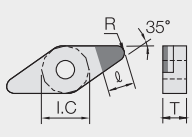
| TPGW | ISO code | | Dimensions (mm) | | | | | PCBN | | | | | | | | | | | | | | | |
|----------|-------------|------------------|------------------|------|------|------|-----|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|--------|--|--|
| | Metric | Inch | I.C | T | R | Hole | φ | EB28X | EB680 | EB570 | EB160 | EB550 | EB150 | EB29X | EB290 | EB170 | EB51 | EB710 | EB120 | EB210 | EB100X | | |
| | | | | | | | | | | | | | | | | | | | | | | | |
| Standard | TPGW 160302 | TPGW 32(0.5) | 9.525 | 3.18 | 0.2 | 4.4 | 4.1 | | | | | | | | | | | | | | | | |
| | 160304 | 321 | 9.525 | 3.18 | 0.4 | 4.4 | 4 | | | | | | | | | | | | | | | | |
| | 160308 | 322 | 9.525 | 3.18 | 0.8 | 4.4 | 3.7 | | | | | | | | | | | | | | | | |
| | 160404 | 331 | 9.525 | 4.76 | 0.4 | 4.4 | 4 | | | | | | | | | | | | | | | | |
| | 160408 | 332 | 9.525 | 4.76 | 0.8 | 4.4 | 3.7 | | | | | | | | | | | | | | | | |
| MT | TPGW 080202 | TPGW 1.5(1.5)0.5 | 4.76 | 2.38 | 0.2 | 2.3 | 2.6 | | | | | | | | | | | | | | | | |
| | 080204 | 1.5(1.5)1 | 4.76 | 2.38 | 0.4 | 2.3 | 2.5 | | | | | | | | | | | | | | | | |
| | 090202 | 1.5)0.5 | 5.56 | 2.38 | 0.2 | 2.5 | 2.6 | | | | | | | | | | | | | | | | |
| | 090204 | 1.5)1 | 5.56 | 2.38 | 0.4 | 2.5 | 2.5 | | | | | | | | | | | | | | | | |
| | 110202 | 21(0.5) | 6.35 | 2.38 | 0.2 | 2.8 | 2.6 | | | | | | | | | | | | | | | | |
| | 110204 | 211 | 6.35 | 2.38 | 0.4 | 2.8 | 2.5 | | | | | | | | | | | | | | | | |
| | 110302 | 22(0.5) | 6.35 | 3.18 | 0.2 | 3.4 | 2.6 | | | | | | | | | | | | | | | | |
| | 110304 | 221 | 6.35 | 3.18 | 0.4 | 3.4 | 2.5 | | | | | | | | | | | | | | | | |
| | 110308 | 222 | 6.35 | 3.18 | 0.8 | 3.4 | 2.2 | | | | | | | | | | | | | | | | |
| | 160302 | 32(0.5) | 9.525 | 3.18 | 0.2 | 4.4 | 2.6 | | | | | | | | | | | | | | | | |
| | 160304 | 321 | 9.525 | 3.18 | 0.4 | 4.4 | 2.5 | | | | | | | | | | | | | | | | |
| | 160308 | 322 | 9.525 | 3.18 | 0.8 | 4.4 | 2.2 | | | | | | | | | | | | | | | | |
| | 160404 | 331 | 9.525 | 4.76 | 0.4 | 4.4 | 2.5 | | | | | | | | | | | | | | | | |
| | 160408 | 332 | 9.525 | 4.76 | 0.8 | 4.4 | 2.2 | | | | | | | | | | | | | | | | |
| | 3MT | TPGW 080202 | TPGW 1.5(1.5)0.5 | 4.76 | 2.38 | 0.2 | 2.3 | 2.6 | | | | | | | | | | | | | | | |
| 080204 | | 1.5(1.5)1 | 4.76 | 2.38 | 0.4 | 2.3 | 2.5 | | | | | | | | | | | | | | | | |
| 090202 | | 1.5)0.5 | 5.56 | 2.38 | 0.2 | 2.5 | 2.6 | | | | | | | | | | | | | | | | |
| 090204 | | 1.5)1 | 5.56 | 2.38 | 0.4 | 2.5 | 2.5 | | | | | | | | | | | | | | | | |
| 110202 | | 21(0.5) | 6.35 | 2.38 | 0.2 | 2.8 | 2.6 | | | | | | | | | | | | | | | | |
| 110204 | | 211 | 6.35 | 2.38 | 0.4 | 2.8 | 2.5 | | | | | | | | | | | | | | | | |
| 110302 | | 22(0.5) | 6.35 | 3.18 | 0.2 | 3.4 | 2.6 | | | | | | | | | | | | | | | | |
| 110304 | | 221 | 6.35 | 3.18 | 0.4 | 3.4 | 2.5 | | | | | | | | | | | | | | | | |
| 110308 | | 222 | 6.35 | 3.18 | 0.8 | 3.4 | 2.2 | | | | | | | | | | | | | | | | |
| 160302 | | 32(0.5) | 9.525 | 3.18 | 0.2 | 4.4 | 2.6 | | | | | | | | | | | | | | | | |
| 160304 | | 321 | 9.525 | 3.18 | 0.4 | 4.4 | 2.5 | | | | | | | | | | | | | | | | |
| 160308 | | 322 | 9.525 | 3.18 | 0.8 | 4.4 | 2.2 | | | | | | | | | | | | | | | | |
| 160404 | | 331 | 9.525 | 4.76 | 0.4 | 4.4 | 2.5 | | | | | | | | | | | | | | | | |
| 160408 | | 332 | 9.525 | 4.76 | 0.8 | 4.4 | 2.2 | | | | | | | | | | | | | | | | |



■ MT : Mini Tips 3MT : Mini 3Tips

VNGA

NEGATIVE _ hole

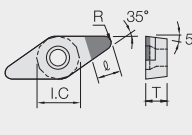
| VNGA | ISO code | | Dimensions (mm) | | | | | PCBN | | | | | | | | | | | | | | | |
|---|-------------|--------------|-----------------|-------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|--------|--|--|
| | Metric | Inch | I.C | T | R | Hole | φ | EB28X | EB580 | EB570 | EB160 | EB550 | EB150 | EB29X | EB290 | EB170 | EB51 | EB710 | EB120 | EB210 | EB100X | | |
| | | | | | | | | | | | | | | | | | | | | | | | |
|  | Standard | VNGA 160402 | VNGA 33(0.5) | 9.525 | 4.76 | 0.2 | 3.81 | 5 | | | | | | | | | | | | | | | |
| | | 160404 | 331 | 9.525 | 4.76 | 0.4 | 3.81 | 4.5 | | | | | | | | | | | | | | | |
| | | 160408 | 332 | 9.525 | 4.76 | 0.8 | 3.81 | 3.7 | | | | | | | | | | | | | | | |
| | | VNGA 160402 | VNGA 33(0.5) | 9.525 | 4.76 | 0.2 | 3.81 | 3 | | | | | | | | | | | | | | | |
| | | 160404 | 331 | 9.525 | 4.76 | 0.4 | 3.81 | 2.5 | | | | | | | | | | | | | | | |
| | | 160408 | 332 | 9.525 | 4.76 | 0.8 | 3.81 | 2.2 | | | | | | | | | | | | | | | |
| | MT | VNGA 160402 | VNGA 33(0.5) | 9.525 | 4.76 | 0.2 | 3.81 | 3 | | | | | | | | | | | | | | | |
| | | 160404 | 331 | 9.525 | 4.76 | 0.4 | 3.81 | 2.5 | | | | | | | | | | | | | | | |
| | | 160408 | 332 | 9.525 | 4.76 | 0.8 | 3.81 | 2.2 | | | | | | | | | | | | | | | |
| | 2MT | VNGA 160402 | VNGA 33(0.5) | 9.525 | 4.76 | 0.2 | 3.81 | 3 | | | | | | | | | | | | | | | |
| | | 160404 | 331 | 9.525 | 4.76 | 0.4 | 3.81 | 2.5 | | | | | | | | | | | | | | | |
| | | 160408 | 332 | 9.525 | 4.76 | 0.8 | 3.81 | 2.2 | | | | | | | | | | | | | | | |
| 4VT | VNGA 160402 | VNGA 33(0.5) | 9.525 | 4.76 | 0.2 | 3.81 | 2.6 | | | | | | | | | | | | | | | | |
| | 160404 | 331 | 9.525 | 4.76 | 0.4 | 3.81 | 2.2 | | | | | | | | | | | | | | | | |
| | 160408 | 332 | 9.525 | 4.76 | 0.8 | 3.81 | 2.3 | | | | | | | | | | | | | | | | |

■ MT : Mini Tips 2MT : Mini 2Tips 4VT : Vertical 4Tips

Holder : 56p, 58p, 65p

VBGW

POSITIVE 5 _ hole

| VBGW | ISO code | | Dimensions (mm) | | | | | PCBN | | | | | | | | | | | | | | | |
|---|----------|-------------|-----------------|-------|------|------|-----|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|--------|--|--|
| | Metric | Inch | I.C | T | R | Hole | φ | EB28X | EB580 | EB570 | EB160 | EB550 | EB150 | EB29X | EB290 | EB170 | EB51 | EB710 | EB120 | EB210 | EB100X | | |
| | | | | | | | | | | | | | | | | | | | | | | | |
|  | Standard | VBGW 110302 | VBGW 22(0.5) | 6.35 | 3.18 | 0.2 | 2.8 | 5 | | | | | | | | | | | | | | | |
| | | 110304 | 221 | 6.35 | 3.18 | 0.4 | 2.8 | 4.5 | | | | | | | | | | | | | | | |
| | | 160402 | 33(0.5) | 9.525 | 4.76 | 0.2 | 2.8 | 5 | | | | | | | | | | | | | | | |
| | | 160404 | 331 | 9.525 | 4.76 | 0.4 | 4.4 | 4.5 | | | | | | | | | | | | | | | |
| | | 160408 | 332 | 9.525 | 4.76 | 0.8 | 4.4 | 3.7 | | | | | | | | | | | | | | | |
| | | 160412 | 333 | 9.525 | 4.76 | 1.2 | 4.4 | 3.3 | | | | | | | | | | | | | | | |
| | MT | VBGW 110302 | VBGW 22(0.5) | 6.35 | 3.18 | 0.2 | 2.8 | 3 | | | | | | | | | | | | | | | |
| | | 110304 | 221 | 6.35 | 3.18 | 0.4 | 2.8 | 2.5 | | | | | | | | | | | | | | | |
| | | 160402 | 33(0.5) | 9.525 | 4.76 | 0.2 | 2.8 | 3 | | | | | | | | | | | | | | | |
| | | 160404 | 331 | 9.525 | 4.76 | 0.4 | 4.4 | 2.5 | | | | | | | | | | | | | | | |
| | | 160408 | 332 | 9.525 | 4.76 | 0.8 | 4.4 | 2.2 | | | | | | | | | | | | | | | |
| | | 160412 | 333 | 9.525 | 4.76 | 1.2 | 4.4 | 1.8 | | | | | | | | | | | | | | | |
| | 2MT | VBGW 110302 | VBGW 22(0.5) | 6.35 | 3.18 | 0.2 | 2.8 | 3 | | | | | | | | | | | | | | | |
| | | 110304 | 221 | 6.35 | 3.18 | 0.4 | 2.8 | 2.5 | | | | | | | | | | | | | | | |
| | | 160402 | 33(0.5) | 9.525 | 4.76 | 0.2 | 2.8 | 3 | | | | | | | | | | | | | | | |
| | | 160404 | 331 | 9.525 | 4.76 | 0.4 | 4.4 | 2.5 | | | | | | | | | | | | | | | |
| | | 160408 | 332 | 9.525 | 4.76 | 0.8 | 4.4 | 2.2 | | | | | | | | | | | | | | | |
| | | 160412 | 333 | 9.525 | 4.76 | 1.2 | 4.4 | 1.8 | | | | | | | | | | | | | | | |

■ MT : Mini Tips 2MT : Mini 2Tips

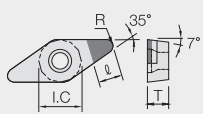
Holder : 71p, 72p

VCGW

POSITIVE 7° hole

Turning

| VCGW | ISO code | | Dimensions (mm) | | | | | PCBN | | | | | | | | | | | | | | |
|----------|-------------|--------------|-----------------|------|-----|------|-----|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|--------|--|
| | Metric | Inch | I.C | T | R | Hole | φ | EB28X | EB680 | EB570 | EB160 | EB550 | EB150 | EB29X | EB290 | EB170 | EB51 | EB710 | EB120 | EB210 | EB100X | |
| | | | | | | | | | | | | | | | | | | | | | | |
| Standard | VCGW 110302 | VCGW 22(0.5) | 6.35 | 3.18 | 0.2 | 2.8 | 5 | | | | | | | | | | | | | | | |
| | 110304 | 221 | 6.35 | 3.18 | 0.4 | 2.8 | 4.5 | | | | | | | | | | | | | | | |
| | 160402 | 33(0.5) | 9.525 | 4.76 | 0.2 | 4.4 | 5 | | | | | | | | | | | | | | | |
| | 160404 | 331 | 9.525 | 4.76 | 0.4 | 4.4 | 4.5 | | | | | | | | | | | | | | | |
| | 160408 | 332 | 9.525 | 4.76 | 0.8 | 4.4 | 3.7 | | | | | | | | | | | | | | | |
| | 160412 | 333 | 9.525 | 4.76 | 1.2 | 4.4 | 3.3 | | | | | | | | | | | | | | | |
| MT | VCGW 110302 | VCGW 22(0.5) | 6.35 | 3.18 | 0.2 | 2.8 | 3 | | | | | | | | | | | | | | | |
| | 110304 | 221 | 6.35 | 3.18 | 0.4 | 2.8 | 2.5 | | | | | | | | | | | | | | | |
| | 160402 | 33(0.5) | 9.525 | 4.76 | 0.2 | 4.4 | 3 | | | | | | | | | | | | | | | |
| | 160404 | 331 | 9.525 | 4.76 | 0.4 | 4.4 | 2.5 | | | | | | | | | | | | | | | |
| | 160408 | 332 | 9.525 | 4.76 | 0.8 | 4.4 | 2.2 | | | | | | | | | | | | | | | |
| | 160412 | 333 | 9.525 | 4.76 | 1.2 | 4.4 | 1.8 | | | | | | | | | | | | | | | |
| 2MT | VCGW 110302 | VCGW 22(0.5) | 6.35 | 3.18 | 0.2 | 2.8 | 3 | | | | | | | | | | | | | | | |
| | 110304 | 221 | 6.35 | 3.18 | 0.4 | 2.8 | 2.5 | | | | | | | | | | | | | | | |
| | 160402 | 33(0.5) | 9.525 | 4.76 | 0.2 | 4.4 | 3 | | | | | | | | | | | | | | | |
| | 160404 | 331 | 9.525 | 4.76 | 0.4 | 4.4 | 2.5 | | | | | | | | | | | | | | | |
| | 160408 | 332 | 9.525 | 4.76 | 0.8 | 4.4 | 2.2 | | | | | | | | | | | | | | | |
| | 160412 | 333 | 9.525 | 4.76 | 1.2 | 4.4 | 1.8 | | | | | | | | | | | | | | | |



■ MT : Mini Tips 2MT : Mini 2Tips

Holder : 73p

RNGN

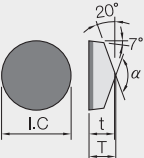
NEGATIVE

| RNGN | ISO code | | Dimensions (mm) | | | | PCBN | | | | | | |
|------|-------------|----------|-----------------|------|---|--|------|--|--|--|--|--|--|
| | Metric | Inch | I.C | T | R | | | | | | | | |
| | RNGN 060300 | RNGN 220 | 6.35 | 3.18 | | | | | | | | | |
| | 090300 | 320 | 9.525 | 3.18 | | | | | | | | | |
| | 090400 | 330 | 9.525 | 4.76 | | | | | | | | | |
| | 120300 | 420 | 12.7 | 3.18 | | | | | | | | | |
| | 120400 | 430 | 12.7 | 4.76 | | | | | | | | | |

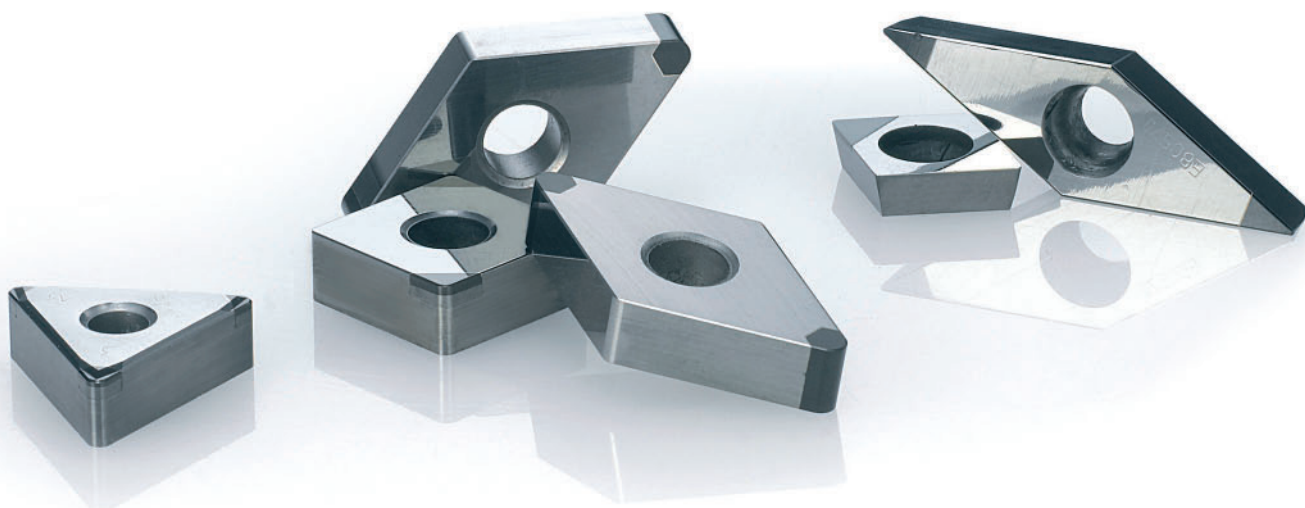
| Shape | ISO code | | Dimensions (mm) | | | | PCBN | | | | | | |
|-------|-------------|----------|-----------------|------|---|--|------|--|--|--|--|--|--|
| | Metric | Inch | I.C | T | R | | | | | | | | |
| | RNGN 060300 | RNGN 220 | 6.35 | 3.18 | | | | | | | | | |
| | 090300 | 320 | 9.525 | 3.18 | | | | | | | | | |
| | 090400 | 330 | 9.525 | 4.76 | | | | | | | | | |
| | 120300 | 420 | 12.7 | 3.18 | | | | | | | | | |
| | 120400 | 430 | 12.7 | 4.76 | | | | | | | | | |

RCGX

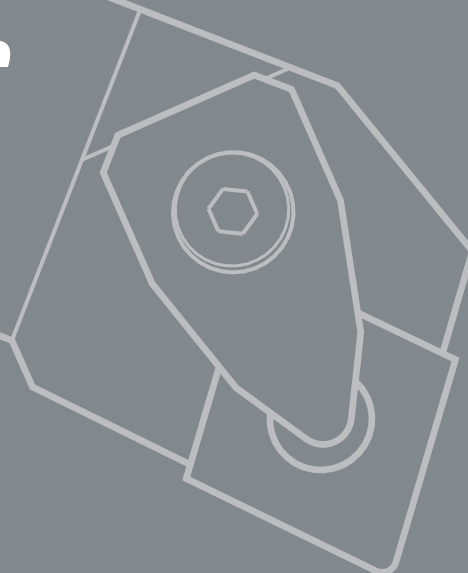
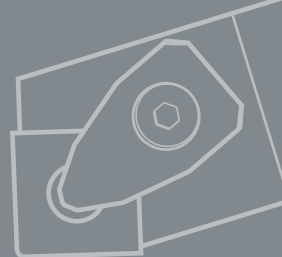
POSITIVE 7

| RCGX | ISO code | | Dimensions (mm) | | | | PCBN | | | | | | | | | | | | |
|---|-------------|----------|-----------------|------|------|----------|------|-------|-------|--|--|--|--|--|--|--|--|--|--|
| | Metric | Inch | I.C | t | T | α | EB51 | EB710 | EB550 | | | | | | | | | | |
|  | RCGX 060300 | RCGX 220 | 6.35 | 3.18 | 3.32 | 140° | | | | | | | | | | | | | |
| | 090300 | 320 | 9.525 | 3.18 | 3.32 | 140° | | | | | | | | | | | | | |
| | 090700 | 3(-) | 9.525 | 7.7 | 7.94 | 120° | | | | | | | | | | | | | |
| | 120400 | 430 | 12.7 | 4.76 | 4.94 | 140° | | | | | | | | | | | | | |
| | 120700 | 4(-) | 12.7 | 7.7 | 7.94 | 140° | | | | | | | | | | | | | |
| | 191000 | (-) | 19.05 | 9.77 | 10 | 120° | | | | | | | | | | | | | |

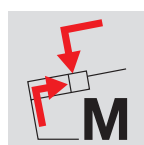
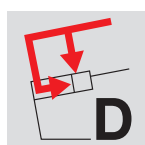
Holder : 68p



Turning_ **Holder**



How to combine the holder

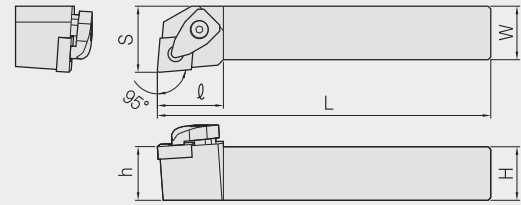


- D** Double clamping
- M** Multi locking
- P** Lever locking
- S** Screw clamping

DCLN^{R/L}

Double Clamping

+ **CN** □ □

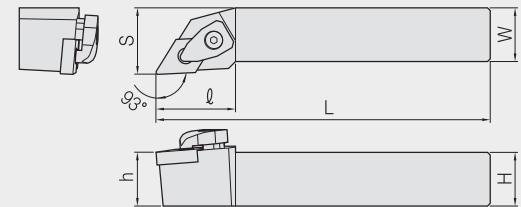


| Insert | Item No. | Dimensions (mm) | | | | | | | Clamp | Clamp Screw | Shim | Shim Screw | Spring | Wrench |
|-----------------|---------------------|-----------------|----|-----|----|----|----|------|---------|-------------|----------|------------|--------|--------|
| | | H | W | L | S | h | ℓ | | | | | | | |
| CN □ □ 1204 □ □ | EH-DCLN R/L 2020-12 | 20 | 20 | 125 | 25 | 20 | 30 | DCL4 | DCS0518 | DSC44 | DSCR0410 | DSPR0714 | W30P | |
| | 2525-12 | 25 | 25 | 150 | 32 | 25 | 30 | | | | | | | |
| | 3225-12 | 32 | 25 | 170 | 32 | 32 | 30 | | | | | | | |
| | 3232-12 | 32 | 32 | 170 | 40 | 32 | 30 | | | | | | | |

DDJN^{R/L}

Double Clamping

+ **DN** □ □

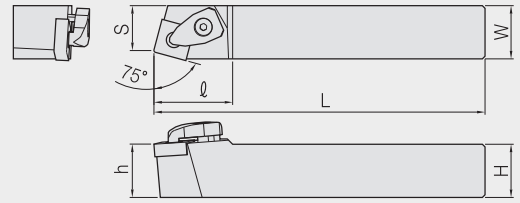


| Insert | Item No. | Dimensions (mm) | | | | | | | Clamp | Clamp Screw | Shim | Shim Screw | Spring | Wrench |
|-----------------|-----------------------|-----------------|----|-----|----|----|----|------|---------|-------------|----------|------------|--------|--------|
| | | H | W | L | S | h | ℓ | | | | | | | |
| DN □ □ 1104 □ □ | EH-DDJN R/L 2020-11 | 20 | 20 | 125 | 25 | 20 | 30 | DCL3 | DCS0415 | DSD32 | DSCR0307 | DSPR0510 | W25P | |
| | 2525-11 | 25 | 25 | 150 | 32 | 25 | 30 | | | | | | | |
| | 3225-11 | 32 | 25 | 170 | 32 | 32 | 30 | | | | | | | |
| | 3232-11 | 32 | 32 | 170 | 40 | 32 | 30 | | | | | | | |
| DN □ □ 1506 □ □ | EH-DDJN R/L 2020-15 | 20 | 20 | 125 | 25 | 20 | 35 | DCL4 | DCS0518 | DSD43 | DSCR0410 | DSPR0714 | W30P | |
| | 2525-15 | 25 | 25 | 150 | 32 | 25 | 35 | | | | | | | |
| | 3225-15 | 32 | 25 | 170 | 32 | 32 | 35 | | | | | | | |
| DN □ □ 1504 □ □ | EH-DDJN R/L 2020-15-3 | 20 | 20 | 125 | 25 | 20 | 35 | DCL4 | DCS0518 | DSD44 | DSCR0410 | DSPR0714 | W30P | |
| | 2525-15-3 | 25 | 25 | 150 | 32 | 25 | 35 | | | | | | | |
| | 3232-15-3 | 32 | 32 | 170 | 40 | 32 | 35 | | | | | | | |

DSBN^{R/L}

Double Clamping

+ **SN** □ □

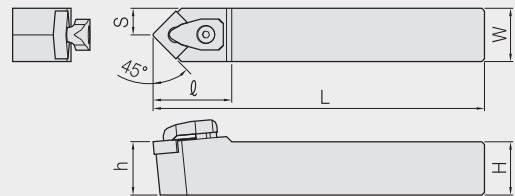


| Insert | Item No. | Dimensions (mm) | | | | | | Clamp | Clamp Screw | Shim | Shim Screw | Spring | Wrench |
|-----------------|---------------------|-----------------|----|-----|----|----|----|-------|-------------|-------|------------|----------|--------|
| | | H | W | L | S | h | l | | | | | | |
| SN □ □ 0903 □ □ | EH-DSBN R/L 2020-09 | 20 | 20 | 125 | 17 | 20 | 25 | DCL3 | DCS0415 | DSS32 | DSCR0307 | DSPR0510 | W25P |
| | 2525-09 | 25 | 25 | 150 | 22 | 25 | 25 | | | | | | |
| SN □ □ 1204 □ □ | EH-DSBN R/L 2020-12 | 20 | 20 | 125 | 17 | 20 | 32 | DCL4 | DCS0518 | DSS44 | DSCR0410 | DSPR0714 | W30P |
| | 2525-12 | 25 | 25 | 150 | 22 | 25 | 32 | | | | | | |
| | 3225-12 | 32 | 25 | 170 | 22 | 32 | 32 | | | | | | |
| | 3232-12 | 32 | 32 | 170 | 27 | 32 | 32 | | | | | | |

DSDNN

Double Clamping

+ **SN** □ □

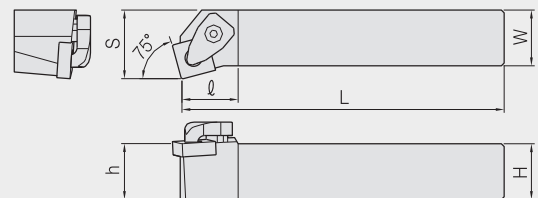


| Insert | Item No. | Dimensions (mm) | | | | | | Clamp | Clamp Screw | Shim | Shim Screw | Spring | Wrench |
|-----------------|------------------|-----------------|----|-----|------|----|------|-------|-------------|-------|------------|----------|--------|
| | | H | W | L | S | h | l | | | | | | |
| SN □ □ 0903 □ □ | EH-DSDNN 2020-09 | 20 | 20 | 125 | 10 | 20 | 26.5 | DCL3 | DCS0415 | DSS32 | DSCR0307 | DSPR0510 | W25P |
| | EH-DSDNN 2020-12 | 20 | 20 | 125 | 10 | 20 | 33 | | | | | | |
| SN □ □ 1204 □ □ | 2525-12 | 25 | 25 | 150 | 12.5 | 25 | 33 | DCL4 | DCS0518 | DSS44 | DSCR0410 | DSPR0714 | W30P |
| | 3225-12 | 32 | 25 | 170 | 12.5 | 32 | 33 | | | | | | |
| | 3232-12 | 32 | 32 | 170 | 16 | 32 | 33 | | | | | | |

DSKN^{R/L}

Double Clamping

+ **SN** □ □

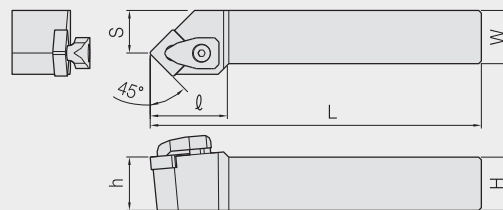


| Insert | Item No. | Dimensions (mm) | | | | | | Clamp | Clamp Screw | Shim | Shim Screw | Spring | Wrench |
|-----------------|---------------------|-----------------|----|-----|----|----|----|-------|-------------|-------|------------|----------|--------|
| | | H | W | L | S | h | l | | | | | | |
| SN □ □ 0903 □ □ | EH-DSKN R/L 2020-09 | 20 | 20 | 125 | 25 | 20 | 20 | DCL3 | DCS0415 | DSS32 | DSCR0307 | DSPR0510 | W25P |
| | EH-DSKN R/L 2020-12 | 20 | 20 | 125 | 25 | 20 | 23 | | | | | | |
| SN □ □ 1204 □ □ | 2525-12 | 25 | 25 | 150 | 32 | 25 | 23 | DCL4 | DCS0518 | DSS44 | DSCR0410 | DSPR0714 | W30P |
| | 3232-12 | 32 | 32 | 170 | 40 | 32 | 23 | | | | | | |

DSSN^{R/L}

Double Clamping

+ **SN** □ □

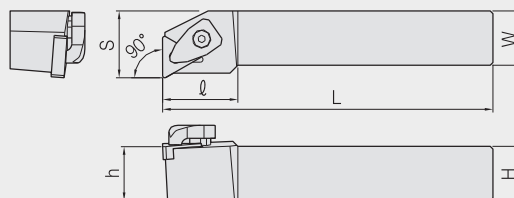


| Insert | Item No. | Dimensions (mm) | | | | | | | Clamp | Clamp Screw | Shim | Shim Screw | Spring | Wrench |
|-----------------|---------------------|-----------------|----|-----|----|----|------|------|---------|-------------|----------|------------|--------|--------|
| | | H | W | L | S | h | ℓ | | | | | | | |
| SN □ □ 0903 □ □ | EH-DSSN R/L 2020-09 | 20 | 20 | 125 | 25 | 20 | 28.5 | DCL3 | DCS0415 | DSS32 | DSCR0307 | DSPR0510 | W25P | |
| | EH-DSSN R/L 2020-12 | 20 | 20 | 125 | 25 | 20 | 35 | | | | | | | |
| SN □ □ 1204 □ □ | 2525-12 | 25 | 25 | 150 | 32 | 25 | 35 | DCL4 | DCS0518 | DSS44 | DSCR0410 | DSPR0714 | W30P | |
| | 3225-12 | 32 | 25 | 170 | 32 | 32 | 35 | | | | | | | |
| | 3232-12 | 32 | 32 | 170 | 40 | 32 | 35 | | | | | | | |

DTFN^{R/L}

Double Clamping

+ **TN** □ □

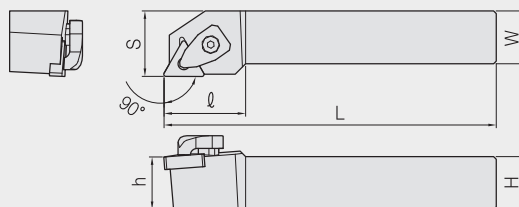


| Insert | Item No. | Dimensions (mm) | | | | | | | Clamp | Clamp Screw | Shim | Shim Screw | Spring | Wrench |
|-----------------|---------------------|-----------------|----|-----|----|----|------|------|---------|-------------|----------|------------|--------|--------|
| | | H | W | L | S | h | ℓ | | | | | | | |
| TN □ □ 1604 □ □ | EH-DTFN R/L 2020-16 | 20 | 20 | 125 | 25 | 20 | 24.5 | DCL3 | DCS0415 | DST32 | DSCR0307 | DSPR0510 | W25P | |
| | 2525-16 | 25 | 25 | 150 | 32 | 25 | 24.5 | | | | | | | |
| | 3232-16 | 32 | 32 | 170 | 40 | 32 | 23.5 | | | | | | | |
| TN □ □ 2204 □ □ | EH-DTFN R/L 2525-22 | 25 | 25 | 150 | 32 | 25 | 33 | DCL4 | DCS0518 | DST44 | DSCR0410 | DSPR0714 | W30P | |
| | 3225-22 | 32 | 25 | 170 | 32 | 32 | 33 | | | | | | | |
| | 3232-22 | 32 | 32 | 170 | 40 | 32 | 33 | | | | | | | |

DTGN^{R/L}

Double Clamping

+ **TN** □ □

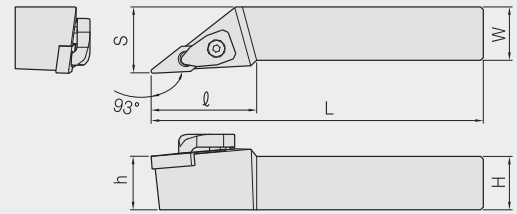


| Insert | Item No. | Dimensions (mm) | | | | | | | Clamp | Clamp Screw | Shim | Shim Screw | Spring | Wrench |
|-----------------|---------------------|-----------------|----|-----|----|----|------|------|---------|-------------|----------|------------|--------|--------|
| | | H | W | L | S | h | ℓ | | | | | | | |
| TN □ □ 1604 □ □ | EH-DTGN R/L 2020-16 | 20 | 20 | 125 | 25 | 20 | 24.5 | DCL3 | DCS0415 | DST32 | DSCR0307 | DSPR0510 | W25P | |
| | 2525-16 | 25 | 25 | 150 | 32 | 25 | 24.5 | | | | | | | |
| | 3232-16 | 32 | 32 | 170 | 40 | 32 | 23.5 | | | | | | | |
| TN □ □ 2204 □ □ | EH-DTGN R/L 2525-22 | 25 | 25 | 150 | 32 | 25 | 32.6 | DCL4 | DCS0518 | DST44 | DSCR0410 | DSPR0714 | W30P | |
| | 3225-22 | 32 | 25 | 170 | 32 | 32 | 32.6 | | | | | | | |
| | 3232-22 | 32 | 32 | 170 | 40 | 32 | 32.6 | | | | | | | |

DVJN^{R/L}

Double Clamping

+ VN □ □

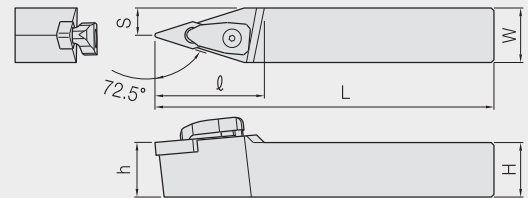


| Insert | Item No. | Dimensions (mm) | | | | | | Clamp | Clamp Screw | Shim | Shim Screw | Spring | Wrench |
|-----------------|---------------------|-----------------|----|-----|----|----|------|-------|-------------|-------|------------|----------|--------|
| | | H | W | L | S | h | l | | | | | | |
| VN □ □ 1604 □ □ | EH-DVJN R/L 2020-16 | 20 | 20 | 125 | 25 | 20 | 41.5 | DCL3 | DCS0518 | DSV32 | DSCR-03508 | DSPR0714 | W30P |
| | 2525-16 | 25 | 25 | 150 | 32 | 25 | 41.5 | | | | | | |
| | 3232-16 | 32 | 32 | 170 | 40 | 32 | 41.5 | | | | | | |

DVVNN

Double Clamping

+ VN □ □

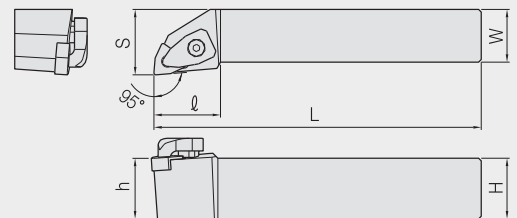


| Insert | Item No. | Dimensions (mm) | | | | | | Clamp | Clamp Screw | Shim | Shim Screw | Spring | Wrench |
|-----------------|-----------------|-----------------|----|-----|------|----|----|-------|-------------|-------|------------|----------|--------|
| | | H | W | L | S | h | l | | | | | | |
| VN □ □ 1604 □ □ | EH-DVNN 2020-16 | 20 | 20 | 125 | 10 | 20 | 40 | DCL3 | DCS0518 | DSV32 | DSCR-03508 | DSPR0714 | W30P |
| | 2525-16 | 25 | 25 | 150 | 12.5 | 25 | 40 | | | | | | |
| | 3232-16 | 32 | 32 | 170 | 16 | 32 | 40 | | | | | | |

DWLN^{R/L}

Double Clamping

+ WN □ □

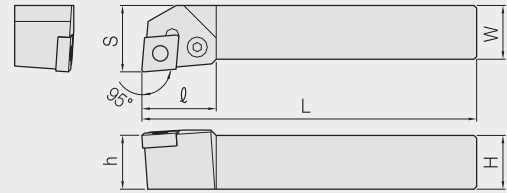


| Insert | Item No. | Dimensions (mm) | | | | | | Clamp | Clamp Screw | Shim | Shim Screw | Spring | Wrench |
|-----------------|---------------------|-----------------|----|-----|----|----|----|-------|-------------|-------|------------|----------|--------|
| | | H | W | L | S | h | l | | | | | | |
| WN □ □ 0604 □ □ | EH-DWLN R/L 2020-06 | 20 | 20 | 125 | 25 | 20 | 26 | DCL3 | DCS0415 | DSW32 | DSCR0307 | DSPR0510 | W25P |
| | 2525-06 | 25 | 25 | 150 | 32 | 25 | 26 | | | | | | |
| WN □ □ 0804 □ □ | EH-DWLN R/L 2020-08 | 20 | 20 | 125 | 25 | 20 | 32 | DCL4 | DCS0518 | DSW44 | DSCR0410 | DSPR0714 | W30P |
| | 2525-08 | 25 | 25 | 150 | 32 | 25 | 32 | | | | | | |

PCLN^{R/L}

Lever Locking

+ **CN** □ □

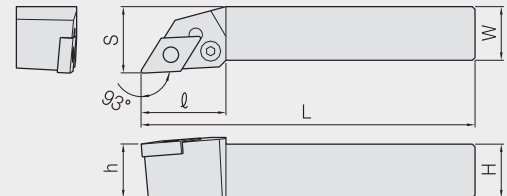


| Insert | Item No. | Dimensions (mm) | | | | | | Lever | Screw | Shim | Shim Pin | Wrench | Shim pin punch |
|-----------------|---------------------|-----------------|----|-----|----|----|----|-------|------------|--------|----------|--------|----------------|
| | | H | W | L | S | h | l | | | | | | |
| CN □ □ 0903 □ □ | EH-PCLN R/L 1616-09 | 16 | 16 | 100 | 20 | 16 | 20 | LV3 | LVSCR-0617 | LVSC32 | LVSP3 | W25L | LVSPS3 |
| | 2020-09 | 20 | 20 | 125 | 25 | 20 | 22 | | | | | | |
| | 2525-09 | 25 | 25 | 150 | 32 | 25 | 22 | | | | | | |
| CN □ □ 1204 □ □ | EH-PCLN R/L 1616-12 | 16 | 16 | 100 | 20 | 16 | 28 | LV4 | LVSCR-0821 | LVSC42 | LVSP4 | W30L | LVSPS4 |
| | 2020-12 | 20 | 20 | 125 | 25 | 20 | 28 | | | | | | |
| | 2525-12 | 25 | 25 | 150 | 32 | 25 | 28 | | | | | | |
| | 3225-12 | 32 | 25 | 170 | 32 | 32 | 28 | | | | | | |
| | 3232-12 | 32 | 32 | 170 | 40 | 32 | 28 | | | | | | |

PDJN^{R/L}

Lever Locking

+ **DN** □ □

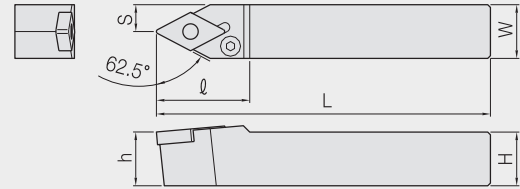


| Insert | Item No. | Dimensions (mm) | | | | | | Lever | Screw | Shim | Shim Pin | Wrench | Shim pin punch |
|-----------------|-----------------------|-----------------|----|-----|----|----|----|-------|------------|---------|----------|--------|----------------|
| | | H | W | L | S | h | l | | | | | | |
| DN □ □ 1104 □ □ | EH-PDJN R/L 1616-11 | 16 | 16 | 100 | 20 | 16 | 25 | LV3 | LVSCR-0617 | LVSD317 | LVSP3 | W25L | LVSPS3 |
| | 2020-11 | 20 | 20 | 125 | 25 | 20 | 25 | | | | | | |
| | 2525-11 | 25 | 25 | 150 | 32 | 25 | 30 | | | | | | |
| DN □ □ 1506 □ □ | EH-PDJN R/L 2020-15 | 20 | 20 | 125 | 25 | 20 | 35 | LV4B | LVSCR-0821 | LVSD42 | LVSP4 | W30L | LVSPS4 |
| | 2525-15 | 25 | 25 | 150 | 32 | 25 | 35 | | | | | | |
| | 3225-15 | 32 | 25 | 170 | 32 | 32 | 35 | | | | | | |
| | 3232-15 | 32 | 32 | 170 | 40 | 32 | 35 | | | | | | |
| DN □ □ 1504 □ □ | EH-PDJN R/L 2020-15-3 | 20 | 20 | 125 | 25 | 20 | 35 | LV4 | LVSCR-0821 | LVSD42 | LVSP4 | W30L | LVSPS4 |
| | 2525-15-3 | 25 | 25 | 150 | 32 | 25 | 35 | | | | | | |
| | 3232-15-3 | 32 | 32 | 170 | 40 | 32 | 35 | | | | | | |

PDNN^{R/L}

Lever Locking

+ **DN** □ □

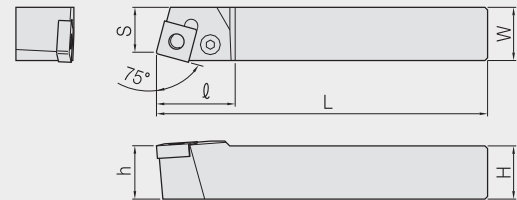


| Insert | Item No. | Dimensions (mm) | | | | | | Lever | Screw | Shim | Shim Pin | Wrench | Shim pin punch |
|-----------------|-----------------------|-----------------|----|-----|------|----|----|-------|------------|--------|----------|--------|----------------|
| | | H | W | L | S | h | ℓ | | | | | | |
| DN □ □ 1506 □ □ | EH-PDNN R/L 2020-15 | 20 | 20 | 125 | 8 | 20 | 37 | LV4B | LVSCR-0821 | LVSD42 | LVSP4 | W30L | LVSPS4 |
| | 2525-15 | 25 | 25 | 150 | 12.5 | 25 | 37 | | | | | | |
| | 3232-15 | 32 | 32 | 150 | 16 | 32 | 37 | | | | | | |
| | 4025-15 | 40 | 25 | 170 | 12.5 | 32 | 37 | | | | | | |
| DN □ □ 1504 □ □ | EH-PDNN R/L 2525-15-3 | 25 | 25 | 150 | 12.5 | 25 | 37 | LV4 | LVSCR-0821 | LVSD42 | LVSP4 | W30L | LVSPS4 |
| | 4025-15-3 | 40 | 25 | 150 | 12.5 | 25 | 37 | | | | | | |

PSBN^{R/L}

Lever Locking

+ **SN** □ □

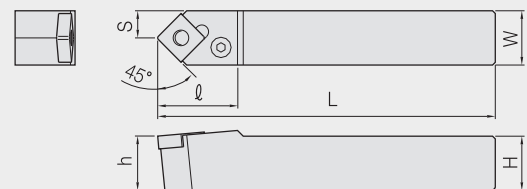


| Insert | Item No. | Dimensions (mm) | | | | | | Lever | Screw | Shim | Shim Pin | Wrench | Shim pin punch |
|-----------------|---------------------|-----------------|----|-----|----|----|----|-------|------------|--------|----------|--------|----------------|
| | | H | W | L | S | h | ℓ | | | | | | |
| SN □ □ 0903 □ □ | EH-PSBN R/L 1616-09 | 16 | 16 | 100 | 13 | 16 | 21 | LV3 | LVSCR-0617 | LVSS32 | LVSP3 | W25L | LVSPS3 |
| | 2020-09 | 20 | 20 | 125 | 17 | 20 | 23 | | | | | | |
| SN □ □ 1204 □ □ | EH-PSBN R/L 2020-12 | 20 | 20 | 125 | 17 | 20 | 28 | LV4 | LVSCR-0821 | LVSS42 | LVSP4 | W30L | LVSPS4 |
| | 2525-12 | 25 | 25 | 150 | 22 | 25 | 28 | | | | | | |
| | 3225-12 | 32 | 32 | 170 | 22 | 32 | 28 | | | | | | |
| | 3232-12 | 32 | 32 | 170 | 27 | 32 | 28 | | | | | | |

PSDNN

Lever Locking

+ **SN** □ □

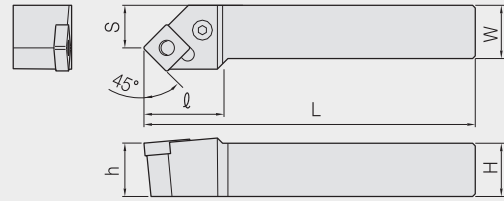


| Insert | Item No. | Dimensions (mm) | | | | | | Lever | Screw | Shim | Shim Pin | Wrench | Shim pin punch |
|-----------------|------------------|-----------------|----|-----|------|----|----|-------|------------|--------|----------|--------|----------------|
| | | H | W | L | S | h | ℓ | | | | | | |
| SN □ □ 0903 □ □ | EH-PSDNN 1616-09 | 16 | 16 | 100 | 13 | 16 | 21 | LV3 | LVSCR0617 | LVSS32 | LVSP3 | W25L | LVSPS3 |
| SN □ □ 1204 □ □ | EH-PSDNN 2020-12 | 20 | 20 | 125 | 10 | 20 | 30 | LV4 | LVSCR-0821 | LVSS42 | LVSP4 | W30L | LVSPS4 |
| | 2525-12 | 25 | 25 | 150 | 12.5 | 25 | 30 | | | | | | |
| | 3232-12 | 32 | 32 | 170 | 16 | 32 | 40 | | | | | | |

PSSN^{R/L}

Lever Locking

+ **SN**□□

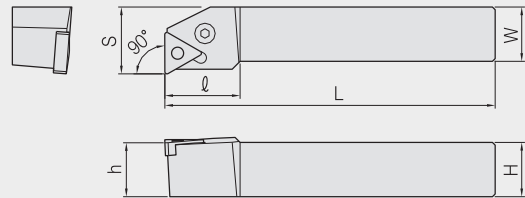


| Insert | Item No. | Dimensions (mm) | | | | | | | Lever | Screw | Shim | Shim Pin | Wrench | Shim pin punch |
|------------|---------------------|-----------------|----|-----|----|----|----|-----|------------|--------|--------|----------|--------|----------------|
| | | H | W | L | S | h | l | | | | | | | |
| SN□□0903□□ | EH-PSSN R/L 1616-09 | 16 | 18 | 100 | 20 | 16 | 25 | LV3 | LVSCR0617 | LVSS32 | LVSP10 | W25L | LVSPS3 | |
| | EH-PSSN R/L 2020-12 | 20 | 20 | 125 | 25 | 20 | 30 | | | | | | | |
| SN□□1204□□ | 2525-12 | 25 | 25 | 150 | 32 | 25 | 36 | LV4 | LVSCR-0821 | LVSS42 | LVSP4 | W30L | LVSPS4 | |
| | 3232-12 | 32 | 32 | 170 | 40 | 32 | 40 | | | | | | | |

PTFN^{R/L}

Lever Locking

+ **TN**□□

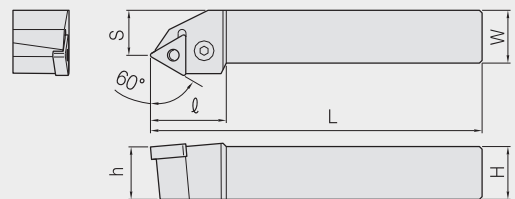


| Insert | Item No. | Dimensions (mm) | | | | | | | Lever | Screw | Shim | Shim Pin | Wrench | Shim pin punch |
|------------|---------------------|-----------------|----|-----|----|----|----|-----|------------|---------|-------|----------|--------|----------------|
| | | H | W | L | S | h | l | | | | | | | |
| TN□□1604□□ | EH-PTFN R/L 1616-16 | 16 | 16 | 100 | 20 | 16 | 20 | | | | | | | |
| | 2020-16 | 20 | 20 | 125 | 25 | 20 | 20 | LV3 | LVSCR-0617 | LVST317 | LVSP3 | W25L | LVSPS3 | |
| | 2525-16 | 25 | 25 | 150 | 32 | 25 | 20 | | | | | | | |
| TN□□2204□□ | EH-PTFN R/L 2525-22 | 25 | 25 | 150 | 32 | 25 | 25 | LV4 | LVSCR-0821 | LVST42 | LVSP4 | W30L | LVSPS4 | |
| | 3232-22 | 32 | 32 | 170 | 40 | 32 | 25 | | | | | | | |

PTTN^{R/L}

Lever Locking

+ **TN**□□

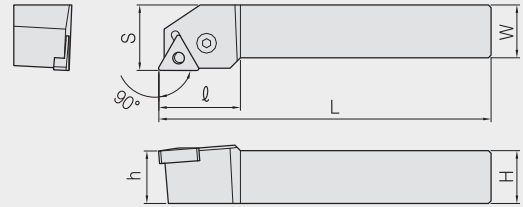


| Insert | Item No. | Dimensions (mm) | | | | | | | Lever | Screw | Shim | Shim Pin | Wrench | Shim pin punch |
|------------|---------------------|-----------------|----|-----|----|----|----|-----|------------|---------|-------|----------|--------|----------------|
| | | H | W | L | S | h | l | | | | | | | |
| TN□□1604□□ | EH-PTTN R/L 1616-16 | 16 | 16 | 100 | 13 | 16 | 25 | | | | | | | |
| | 2020-16 | 20 | 20 | 125 | 17 | 20 | 25 | LV3 | LVSCR-0617 | LVST317 | LVSP3 | W25L | LVSPS3 | |
| | 2525-16 | 25 | 25 | 150 | 22 | 25 | 32 | | | | | | | |
| TN□□2204□□ | EH-PTTN R/L 2525-22 | 25 | 25 | 150 | 22 | 25 | 32 | LV4 | LVSCR-0821 | LVST42 | LVSP4 | W30L | LVSPS4 | |

PTGN^{R/L}

Lever Locking

+ **TN**□□

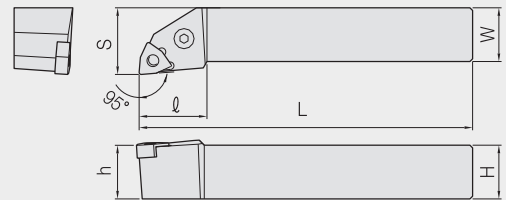


| Insert | Item No. | Dimensions (mm) | | | | | | Lever | Screw | Shim | Shim Pin | Wrench | Shim pin punch |
|------------|---------------------|-----------------|----|-----|----|----|----|-------|-------------|---------|----------|--------|----------------|
| | | H | W | L | S | h | l | | | | | | |
| TN□□1103□□ | EH-PTGN R/L 1212-11 | 12 | 12 | 80 | 16 | 12 | 16 | LV2 | LVSCR-0509B | - | - | W20L | - |
| | 1616-11 | 16 | 16 | 100 | 20 | 16 | 18 | | | | | | |
| | 2020-11 | 20 | 20 | 125 | 25 | 20 | 19 | | | | | | |
| | 2525-11 | 25 | 25 | 150 | 32 | 25 | 20 | | | | | | |
| TN□□1604□□ | EH-PTGN R/L 1616-16 | 16 | 16 | 100 | 20 | 16 | 20 | LV3 | LVSCR-0617 | LVST317 | LVSP3 | W25L | LVSPS3 |
| | 2020-16 | 20 | 20 | 125 | 25 | 20 | 20 | | | | | | |
| | 2525-16 | 25 | 25 | 150 | 32 | 25 | 20 | | | | | | |
| | 3232-16 | 32 | 32 | 170 | 40 | 32 | 20 | | | | | | |
| TN□□2204□□ | EH-PTGN R/L 2525-22 | 25 | 25 | 150 | 32 | 25 | 28 | LV4 | LVSCR-0821 | LVST42 | LVSP4 | W30L | LVSPS4 |
| | 3232-22 | 32 | 32 | 170 | 40 | 32 | 28 | | | | | | |

PWLN^{R/L}

Lever Locking

+ **WN**□□

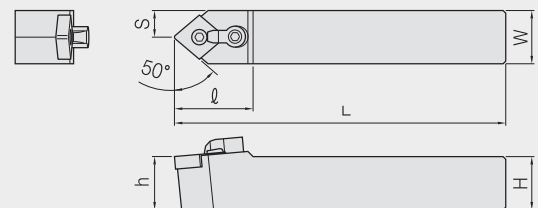


| Insert | Item No. | Dimensions (mm) | | | | | | Lever | Screw | Shim | Shim Pin | Wrench | Shim pin punch |
|------------|---------------------|-----------------|----|-----|----|----|----|-------|------------|----------|----------|--------|----------------|
| | | H | W | L | S | h | l | | | | | | |
| WN□□0604□□ | EH-PWLN R/L 1616-06 | 16 | 16 | 100 | 20 | 16 | 20 | LV3 | LVSCR-0617 | LVSW-317 | LVSP3 | W25L | LVSPS3 |
| | 2020-06 | 20 | 20 | 125 | 25 | 20 | 20 | | | | | | |
| | 2525-06 | 25 | 25 | 150 | 32 | 25 | 20 | | | | | | |
| WN□□0804□□ | EH-PWLN R/L 2020-08 | 20 | 20 | 125 | 25 | 20 | 26 | LV4 | LVSCR-0821 | LVSW42 | LVSP4 | W30L | LVSPS4 |
| | 2525-08 | 25 | 25 | 150 | 32 | 25 | 26 | | | | | | |

MCMNN

Multi Locking

+ **CN**□□

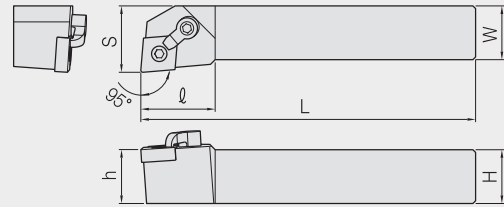


| Insert | Item No. | Dimensions (mm) | | | | | | Clamp | Clamp Screw | Shim | Shim Pin | Wrench |
|------------|------------------|-----------------|----|-----|------|----|----|-------|--------------|-------|----------|------------------|
| | | H | W | L | S | h | l | | | | | |
| CN□□1204□□ | EH-MCMNN 2020-12 | 20 | 20 | 125 | 10 | 20 | 32 | MCL6N | MCSCR-1/4-25 | MSC43 | MSP4D | W31.8L W23.8L |
| | 2525-12 | 25 | 25 | 150 | 12.5 | 25 | 32 | | | | | |
| | 3232-12 | 32 | 32 | 170 | 16 | 32 | 32 | | | | | |

MCLN^{R/L}

Multi Locking

+ **CN** □ □

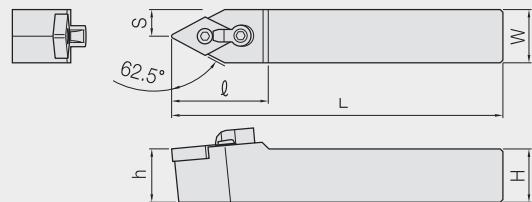


| Insert | Item No. | Dimensions (mm) | | | | | | Clamp | Clamp Screw | Shim | Shim Pin | Wrench |
|-----------------|---------------------|-----------------|----|-----|----|----|----|-------|----------------|-------|----------|------------------|
| | | H | W | L | S | h | l | | | | | |
| CN □ □ 0903 □ □ | EH-MCLN R/L 1616-09 | 16 | 16 | 100 | 20 | 16 | 25 | MCL7N | MCSCR-10-32-19 | MSC32 | MSP3DS | W23.8L W19.8L |
| | 2020-09 | 20 | 20 | 125 | 25 | 20 | 25 | | | | | |
| | 2525-09 | 25 | 25 | 150 | 32 | 25 | 25 | | | | | |
| CN □ □ 1204 □ □ | EH-MCLN R/L 2020-12 | 20 | 20 | 125 | 25 | 20 | 32 | MCL6N | MCSCR-1/4-25 | MSC43 | MSP4D | W31.8L W23.8L |
| | 2525-12 | 25 | 25 | 150 | 32 | 25 | 32 | | | | | |
| | 3225-12 | 32 | 25 | 170 | 32 | 32 | 32 | | | | | |
| | 3232-12 | 32 | 32 | 170 | 40 | 32 | 32 | | | | | |

MDNNN

Multi Locking

+ **DN** □ □

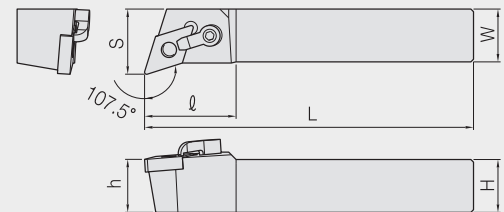


| Insert | Item No. | Dimensions (mm) | | | | | | Clamp | Clamp Screw | Shim | Shim Pin | Wrench |
|-----------------|--------------------|-----------------|----|-----|------|----|----|-------|---------------|-------|----------|------------------|
| | | H | W | L | S | h | l | | | | | |
| DN □ □ 1504 □ □ | EH-MDNNN 2525-15-3 | 25 | 25 | 150 | 12.5 | 25 | 41 | MCL8N | MCSCR-5/16-32 | MSD43 | MSP4D | W39.7L W23.8L |
| | EH-MDNNN 2525-15 | 25 | 25 | 150 | 12.5 | 25 | 41 | | | | | |
| DN □ □ 1506 □ □ | EH-MDNNN 2525-15 | 25 | 25 | 150 | 12.5 | 25 | 41 | MCL8N | MCSCR-5/16-32 | MSD43 | MSP4DL | W39.7L W23.8L |

MDQN^{R/L}

Multi Locking

+ **DN** □ □

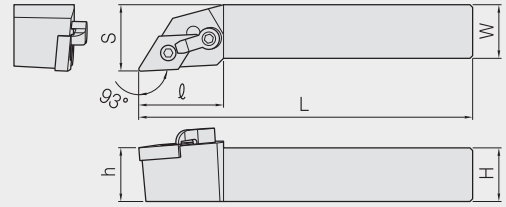


| Insert | Item No. | Dimensions (mm) | | | | | | Clamp | Clamp Screw | Shim | Shim Pin | Wrench |
|-----------------|-----------------------|-----------------|----|-----|----|----|----|-------|--------------|-------|----------|------------------|
| | | H | W | L | S | h | l | | | | | |
| DN □ □ 1504 □ □ | EH-MDQN R/L 2525-15-3 | 25 | 25 | 150 | 32 | 25 | 36 | MCL6N | MCSCR-1/4-25 | MSD43 | MSP4D | W31.8L W23.8L |
| | 3232-15-3 | 32 | 32 | 170 | 40 | 32 | 36 | | | | | |
| DN □ □ 1506 □ □ | EH-MDQN R/L 2525-15 | 25 | 25 | 150 | 32 | 25 | 36 | MCL6N | MCSCR-1/4-25 | MSD43 | MSP4DL | W31.8L W23.8L |
| | 3232-15 | 32 | 32 | 170 | 40 | 32 | 36 | | | | | |

MDJN^{R/L}

Multi Locking

+ **DN** □ □

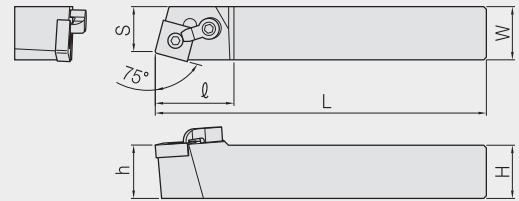


| Insert | Item No. | Dimensions (mm) | | | | | | Clamp | Clamp Screw | Shim | Shim Pin | Wrench |
|-----------------|-----------------------|-----------------|----|-----|----|----|----|-------|--------------|-------|----------|------------------|
| | | H | W | L | S | h | l | | | | | |
| DN □ □ 1104 □ □ | EH-MDJN R/L 2020-11 | 20 | 20 | 125 | 25 | 20 | 32 | MCL6N | MCSCR-1/4-19 | MSD32 | MSP3D | W31.8L W19.8L |
| | 2525-11 | 25 | 25 | 150 | 32 | 25 | 32 | | | | | |
| DN □ □ 1504 □ □ | EH-MDJN R/L 2020-15-3 | 20 | 20 | 125 | 25 | 20 | 36 | MCL6N | MCSCR-1/4-25 | MSD43 | MSP4D | W31.8L W23.8L |
| | 2525-15-3 | 25 | 25 | 150 | 32 | 25 | 36 | | | | | |
| | 3232-15-3 | 32 | 32 | 170 | 40 | 32 | 36 | | | | | |
| DN □ □ 1506 □ □ | EH-MDJN R/L 2020-15 | 20 | 20 | 125 | 25 | 20 | 36 | MCL6N | MCSCR-1/4-25 | MSD43 | MSP4DL | W31.8L W23.8L |
| | 2525-15 | 25 | 25 | 150 | 32 | 25 | 36 | | | | | |
| | 3232-15 | 32 | 32 | 170 | 40 | 32 | 36 | | | | | |

MSBN^{R/L}

Multi Locking

+ **SN** □ □

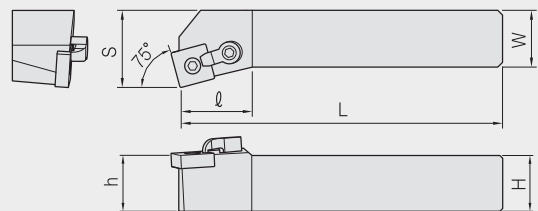


| Insert | Item No. | Dimensions (mm) | | | | | | Clamp | Clamp Screw | Shim | Shim Pin | Wrench |
|-----------------|---------------------|-----------------|----|-----|----|----|----|--------|---------------|-------|----------|------------------|
| | | H | W | L | S | h | l | | | | | |
| SN □ □ 1204 □ □ | EH-MSBN R/L 2020-12 | 20 | 20 | 125 | 17 | 20 | 32 | MCL8N1 | MCSCR-5/16-32 | MSS43 | MSP4D | W39.7L W23.8L |
| | 2525-12 | 25 | 25 | 150 | 22 | 25 | 32 | | | | | |

MSKN^{R/L}

Multi Locking

+ **SN** □ □

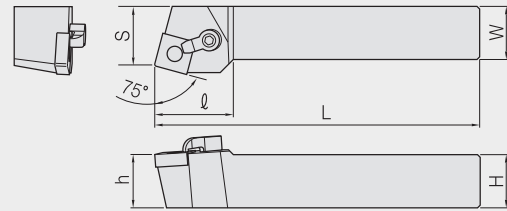


| Insert | Item No. | Dimensions (mm) | | | | | | Clamp | Clamp Screw | Shim | Shim Pin | Wrench |
|-----------------|---------------------|-----------------|----|-----|----|----|----|--------|----------------|-------|----------|------------------|
| | | H | W | L | S | h | l | | | | | |
| SN □ □ 0903 □ □ | EH-MSKN R/L 1616-09 | 16 | 16 | 100 | 20 | 16 | 28 | MCL7N | MCSCR-10-32-19 | MSS32 | MSP3DS | W19.8L W23.8L |
| | 2020-09 | 20 | 20 | 125 | 22 | 20 | 28 | | | | | |
| SN □ □ 1204 □ □ | EH-MSKN R/L 2020-12 | 20 | 20 | 125 | 25 | 20 | 32 | MCL8N1 | MCSCR-5/16-32 | MSS43 | MSP4D | W39.7L W23.8L |
| | 2525-12 | 25 | 25 | 150 | 32 | 25 | 32 | | | | | |
| | 3225-12 | 32 | 32 | 170 | 32 | 32 | 32 | | | | | |

M SRN^{R/L}

Multi Locking

+ SN □□ □□

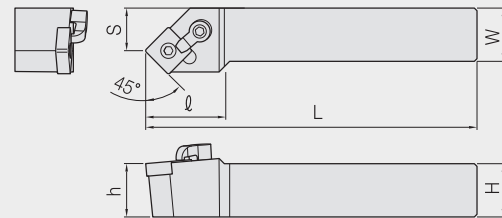


| Insert | Item No. | Dimensions (mm) | | | | | | | Clamp | Clamp Screw | Shim | Shim Pin | Wrench |
|--------------|--------------------------------|-----------------|----|-----|----|----|----|--------|----------------|-------------|--------|------------------|--------|
| | | H | W | L | S | h | l | | | | | | |
| SN □□0903 □□ | EH-MSRN R/L 1616-09 2020-09 | 16 | 16 | 100 | 17 | 16 | 28 | MCL7N | MCSCR-10-32-19 | MSS32 | MSP3DS | W19.8L W23.8L | |
| | | 20 | 20 | 125 | 22 | 20 | 28 | | | | | | |
| SN □□1204 □□ | EH-MSRN R/L 2020-12 2525-12 | 20 | 20 | 125 | 22 | 20 | 32 | MCL8N1 | MCSCR-5/16-32 | MSS43 | MSP4D | W39.7L W23.8L | |
| | | 25 | 25 | 150 | 27 | 25 | 32 | | | | | | |

M SSN^{R/L}

Multi Locking

+ SN □□ □□

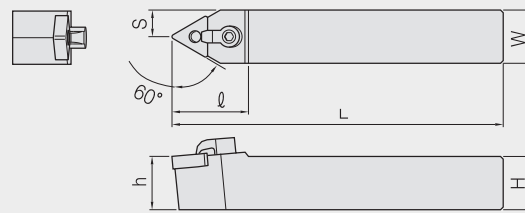


| Insert | Item No. | Dimensions (mm) | | | | | | | Clamp | Clamp Screw | Shim | Shim Pin | Wrench |
|--------------|--------------------------------|-----------------|----|-----|----|----|----|--------|----------------|-------------|--------|------------------|--------|
| | | H | W | L | S | h | l | | | | | | |
| SN □□0903 □□ | EH-MSSN R/L 1616-09 2020-09 | 16 | 16 | 100 | 20 | 16 | 28 | MCL7N | MCSCR-10-32-19 | MSS32 | MSP3DS | W19.8L W23.8L | |
| | | 20 | 20 | 125 | 25 | 20 | 28 | | | | | | |
| SN □□1204 □□ | EH-MSSN R/L 2020-12 2525-12 | 20 | 20 | 125 | 25 | 20 | 32 | MCL8N1 | MCSCR-5/16-32 | MSS43 | MSP4D | W39.7L W23.8L | |
| | | 25 | 25 | 150 | 32 | 25 | 32 | | | | | | |

M TENN

Multi Locking

+ TN □□ □□

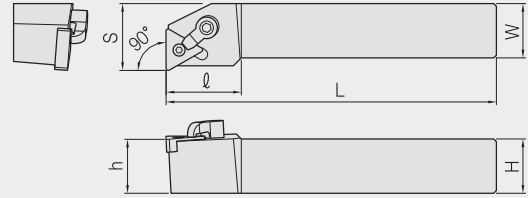


| Insert | Item No. | Dimensions (mm) | | | | | | | Clamp | Clamp Screw | Shim | Shim Pin | Wrench |
|--------------|-----------------------------|-----------------|----|-----|------|----|----|--------|----------------|-------------|-------|------------------|--------|
| | | H | W | L | S | h | l | | | | | | |
| TN □□1604 □□ | EH-MTENN 2020-16 2525-16 | 20 | 20 | 125 | 10 | 20 | 32 | MCL7N | MCSCR-10-32-19 | MST32 | MSP3D | W23.8L W19.8L | |
| | | 25 | 25 | 150 | 12.5 | 25 | 32 | | | | | | |
| TN □□2204 □□ | EH-MTENN 2525-22 | 25 | 25 | 150 | 12.5 | 25 | 35 | MCL8N1 | MCSCR-5/16-32 | MST43 | MSP4D | W39.7L W23.8L | |

MTFN^{R/L}

Multi Locking

+ **TN** □ □

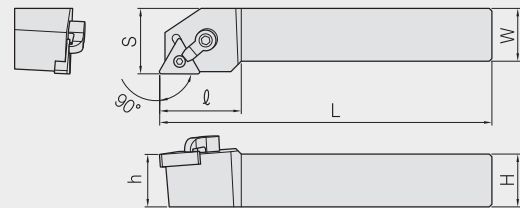


| Insert | Item No. | Dimensions (mm) | | | | | | Clamp | Clamp Screw | Shim | Shim Pin | Wrench |
|-----------------|---------------------|-----------------|----|-----|----|----|----|--------|----------------|-------|----------|------------------|
| | | H | W | L | S | h | l | | | | | |
| TN □ □ 1604 □ □ | EH-MTFN R/L 1616-16 | 16 | 16 | 100 | 20 | 16 | 32 | MCL7N | MCSCR-10-32-19 | MST32 | MSP3D | W23.8L W19.8L |
| | 2020-16 | 20 | 20 | 125 | 25 | 20 | 32 | | | | | |
| | 2525-16 | 25 | 25 | 150 | 32 | 25 | 32 | | | | | |
| TN □ □ 2204 □ □ | EH-MTFN R/L 2525-22 | 25 | 25 | 150 | 32 | 25 | 32 | MCL8N1 | MCSCR-5/16-32 | MST43 | MSP4D | W39.7L W23.8L |
| | 3232-22 | 32 | 32 | 170 | 40 | 32 | 32 | | | | | |
| | 4040-22 | 40 | 40 | 250 | 50 | 40 | 32 | | | | | |

MTGN^{R/L}

Multi Locking

+ **TN** □ □

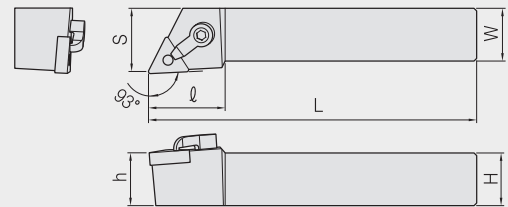


| Insert | Item No. | Dimensions (mm) | | | | | | Clamp | Clamp Screw | Shim | Shim Pin | Wrench |
|-----------------|---------------------|-----------------|----|-----|----|----|----|--------|----------------|-------|----------|------------------|
| | | H | W | L | S | h | l | | | | | |
| TN □ □ 1604 □ □ | EH-MTGN R/L 1616-16 | 16 | 16 | 100 | 20 | 16 | 32 | MCL7N | MCSCR-10-32-19 | MST32 | MSP3D | W23.8L W19.8L |
| | 2020-16 | 20 | 20 | 125 | 25 | 20 | 32 | | | | | |
| | 2525-16 | 25 | 25 | 150 | 32 | 25 | 32 | | | | | |
| TN □ □ 2204 □ □ | EH-MTGN R/L 2525-22 | 25 | 25 | 150 | 32 | 25 | 32 | MCL8N1 | MCSCR-5/16-32 | MST43 | MSP4D | W39.7L W23.8L |
| | 3232-22 | 32 | 32 | 170 | 40 | 32 | 32 | | | | | |

MTJN^{R/L}

Multi Locking

+ **TN** □ □

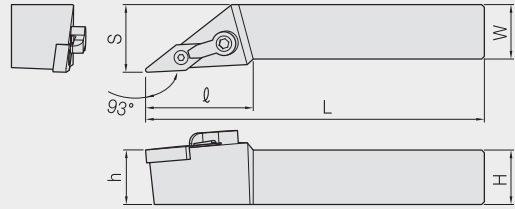


| Insert | Item No. | Dimensions (mm) | | | | | | Clamp | Clamp Screw | Shim | Shim Pin | Wrench |
|-----------------|---------------------|-----------------|----|-----|----|----|----|--------|----------------|-------|----------|------------------|
| | | H | W | L | S | h | l | | | | | |
| TN □ □ 1604 □ □ | EH-MTJN R/L 2020-16 | 20 | 20 | 125 | 25 | 20 | 32 | MCL7N | MCSCR-10-32-19 | MST32 | MSP3D | W23.8L W19.8L |
| | 2525-16 | 25 | 25 | 150 | 32 | 25 | 32 | | | | | |
| TN □ □ 2204 □ □ | EH-MTJN R/L 2525-22 | 25 | 25 | 150 | 32 | 25 | 32 | MCL8N1 | MCSCR-5/16-32 | MST43 | MSP4D | W39.7L W23.8L |
| | 3232-22 | 32 | 32 | 170 | 40 | 32 | 32 | | | | | |

MVJN^{R/L}

Multi Locking

+ VN□□

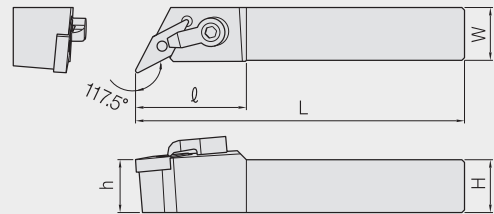


| Insert | Item No. | Dimensions (mm) | | | | | | | Clamp | Clamp Screw | Shim | Shim Pin | Wrench |
|------------|---------------------|-----------------|----|-----|----|----|----|--------|---------------|-------------|-------|------------------|--------|
| | | H | W | L | S | h | ℓ | | | | | | |
| VN□□1604□□ | EH-MVJN R/L 2020-16 | 20 | 20 | 125 | 25 | 20 | 37 | MCL8N1 | MCSCR-5/16-32 | MSV32 | MSP3D | W39.7L W23.8L | |
| | 2525-16 | 25 | 25 | 150 | 32 | 25 | 37 | | | | | | |
| | 3232-16 | 32 | 32 | 170 | 40 | 32 | 37 | | | | | | |

MVQN^{R/L}

Multi Locking

+ VN□□

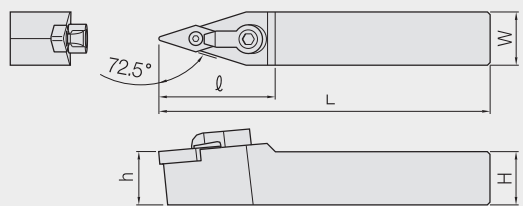


| Insert | Item No. | Dimensions (mm) | | | | | | | Clamp | Clamp Screw | Shim | Shim Pin | Wrench |
|------------|---------------------|-----------------|----|-----|----|----|----|--------|-------|-------------|-------|------------------|--------|
| | | H | W | L | S | h | ℓ | | | | | | |
| VN□□1604□□ | EH-MVQN R/L 2020-16 | 20 | 20 | 125 | 25 | 20 | 42 | MCL8N2 | | MSV32 | MSP3D | W39.7L W19.8L | |
| | 2525-16 | 25 | 25 | 150 | 32 | 25 | 42 | | | | | | |
| | 3232-16 | 32 | 32 | 170 | 40 | 32 | 37 | | | | | | |

MVVNN

Multi Locking

+ VN□□

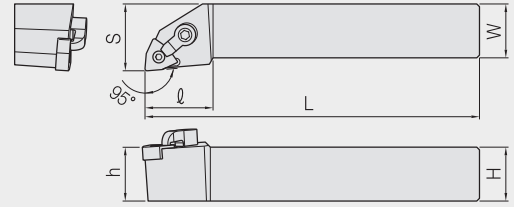


| Insert | Item No. | Dimensions (mm) | | | | | | | Clamp | Clamp Screw | Shim | Shim Pin | Wrench |
|------------|------------------|-----------------|----|-----|----|----|----|--------|-------|-------------|-------|------------------|--------|
| | | H | W | L | S | h | ℓ | | | | | | |
| VN□□1604□□ | EH-MVVNN 2020-16 | 20 | 20 | 125 | 25 | 20 | 42 | MCL8N2 | | MSV32 | MSP3D | W39.7L W19.8L | |
| | 2525-16 | 25 | 25 | 150 | 32 | 25 | 42 | | | | | | |

MWLN^{R/L}

Multi Locking

+ **WN** □ □

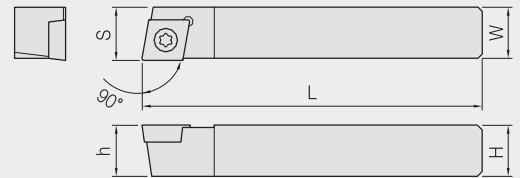


| Insert | Item No. | Dimensions (mm) | | | | | | Clamp | Clamp Screw | Shim | Shim Pin | Wrench |
|-----------------|---------------------|-----------------|----|-----|----|----|----|-------|----------------|-------|----------|--------------------|
| | | H | W | L | S | h | l | | | | | |
| WN □ □ 0604 □ □ | EH-MWLN R/L 2020-06 | 20 | 20 | 125 | 25 | 20 | 32 | MCL7N | MCSCR-10-32-19 | MSW32 | MSP3D | W23.8L W19.8L |
| | 2525-06 | 25 | 25 | 150 | 32 | 25 | 32 | | | | | |
| | 3232-06 | 32 | 32 | 170 | 40 | 32 | 32 | | | | | |
| WN □ □ 0804 □ □ | EH-MWLN R/L 2020-08 | 20 | 20 | 125 | 25 | 20 | 32 | MCL8N | MCSCR-1/4-21 | MSW43 | MSP4D | HW31.8L HW23.8L |
| | 2525-08 | 25 | 25 | 150 | 32 | 25 | 32 | | | | | |
| | 3232-08 | 32 | 32 | 170 | 40 | 32 | 32 | | | | | |

SCAC^{R/L}

Screw On

+ **CC** □ □

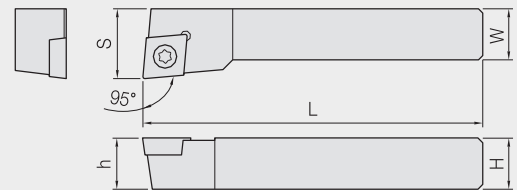


| Insert | Item No. | Dimensions (mm) | | | | | | Screw | Shim | Shim Screw | Wrench |
|-----------------|---------------------|-----------------|----|----|------|----|----------|-------|------|------------|--------|
| | | H | W | L | S | h | | | | | |
| CC □ □ 0602 □ □ | EH-SCAC R/L 1010-06 | 10 | 10 | 70 | 10.5 | 10 | SCR02565 | - | - | TW07P | |
| CC □ □ 09T3 □ □ | 1212-09 | 12 | 12 | 80 | 12.5 | 12 | SCR03508 | - | - | TW15P | |

SCLC^{R/L}

Screw On

+ **CC** □ □

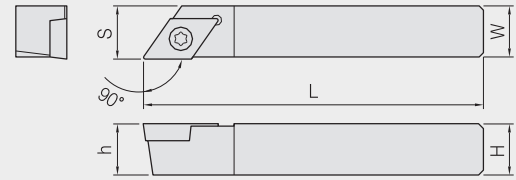


| Insert | Item No. | Dimensions (mm) | | | | | | Screw | Shim | Shim Screw | Wrench |
|-----------------|---------------------|-----------------|----|-----|----|----|----|----------|-------|------------|---------------|
| | | H | W | L | S | h | l | | | | |
| CC □ □ 0602 □ □ | EH-SCLC R/L 0808-06 | 08 | 08 | 60 | 10 | 08 | 10 | SCR02565 | - | - | TW07P |
| | 1010-06 | 10 | 10 | 70 | 16 | 10 | 10 | | | | |
| CC □ □ 09T3 □ □ | EH-SCLC R/L 1212-09 | 12 | 12 | 80 | 20 | 12 | 16 | SCR03508 | - | - | TW15P |
| | 1616-09 | 16 | 16 | 100 | 20 | 16 | 16 | | | | |
| | 2020-09 | 20 | 20 | 125 | 25 | 20 | 16 | | | | |
| CC □ □ 1204 □ □ | EH-SCLC R/L 2020-12 | 20 | 20 | 125 | 25 | 20 | 25 | SCR0411F | SSC42 | SSCR0610 | TW15P W40L |
| | 2525-12 | 25 | 25 | 150 | 32 | 25 | 26 | | | | |

SDAC^{R/L}

Screw On

+ **DC** □ □

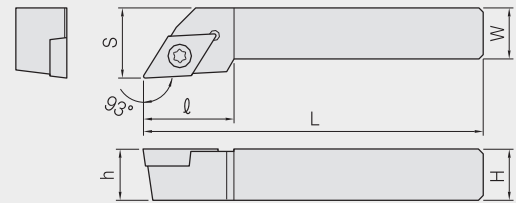


| Insert | Item No. | Dimensions (mm) | | | | | | Screw | Shim | Shim Screw | Wrench |
|-----------------|---------------------|-----------------|----|-----|------|----|----------|-------|----------|------------|--------|
| | | H | W | L | S | h | | | | | |
| DC □ □ 0702 □ □ | EH-SDAC R/L 1010-07 | 10 | 10 | 70 | 10.5 | 10 | SCR02565 | - | - | TW07P | |
| | EH-SDAC R/L 1212-11 | 12 | 12 | 80 | 12.5 | 12 | | | | | |
| DC □ □ 11T3 □ □ | 1616-11 | 16 | 16 | 100 | 16.5 | 16 | SCR03512 | SSD32 | SSCR0509 | TW15P,W35L | |

SDJC^{R/L}

Screw On

+ **DC** □ □

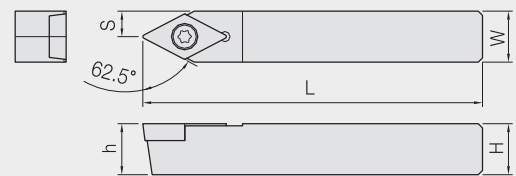


| Insert | Item No. | Dimensions (mm) | | | | | | | | Screw | Shim | Shim Screw | Wrench |
|-----------------|---------------------|-----------------|----|-----|----|----|----|----------|-------|----------|------------|------------|--------|
| | | H | W | L | S | h | ℓ | | | | | | |
| DC □ □ 0702 □ □ | EH-SDJC R/L 1010-07 | 10 | 10 | 70 | 12 | 10 | 15 | SCR02565 | - | - | TW07P | | |
| | 1212-07 | 12 | 12 | 80 | 16 | 12 | 15 | | | | | | |
| | 1616-07 | 16 | 16 | 100 | 20 | 16 | 18 | | | | | | |
| | 2020-07 | 20 | 20 | 125 | 25 | 20 | 15 | | | | | | |
| DC □ □ 11T3 □ □ | EH-SDJC R/L 1212-11 | 12 | 12 | 80 | 16 | 12 | 15 | SCR03512 | SSD32 | SSCR0509 | TW15P,W35L | | |
| | 1616-11 | 16 | 16 | 100 | 20 | 16 | 24 | | | | | | |
| | 2020-11 | 20 | 20 | 125 | 25 | 20 | 24 | | | | | | |
| | 2525-11 | 25 | 25 | 150 | 32 | 25 | 29 | | | | | | |

SDNCN

Screw On

+ **DC** □ □

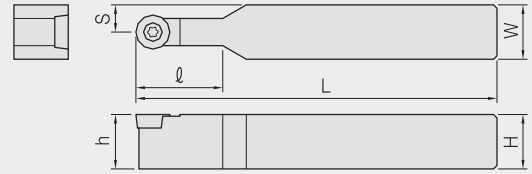


| Insert | Item No. | Dimensions (mm) | | | | | | Screw | Shim | Shim Screw | Wrench |
|-----------------|------------------|-----------------|----|-----|----|----|----------|-------|----------|---------------|--------|
| | | H | W | L | S | h | | | | | |
| DC □ □ 0702 □ □ | EH-SDNCN 1010-07 | 10 | 10 | 70 | 5 | 10 | SCR02565 | - | - | TW07P | |
| | 1212-07 | 12 | 12 | 80 | 6 | 12 | | | | | |
| DC □ □ 11T3 □ □ | EH-SDNCN 1212-11 | 12 | 12 | 100 | 6 | 12 | SCR03508 | - | - | TW15P | |
| DC □ □ 11T3 □ □ | EH-SDNCN 1616-11 | 16 | 16 | 100 | 8 | 16 | SCR03512 | SSD32 | SSCR0509 | TW15P W35L | |
| | 2020-11 | 20 | 20 | 125 | 10 | 20 | | | | | |

SRDCN

Screw On

+ **RCGT**

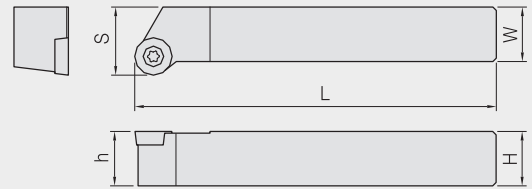


| Insert | Item No. | Dimensions (mm) | | | | | | | Screw | Shim | Shim Screw | Wrench |
|-------------|------------------|-----------------|----|-----|------|----|----|-----------|-------|----------|------------|--------|
| | | H | W | L | S | h | ℓ | | | | | |
| RCGT 0602M0 | EH-SRDCN 1010-06 | 10 | 10 | 70 | 5 | 10 | 10 | SCR02565 | - | - | TW07P | |
| | 1212-06 | 12 | 12 | 80 | 6 | 12 | 12 | | | | | |
| | 1616-06 | 16 | 16 | 100 | 8 | 16 | 12 | | | | | |
| | 2525-06 | 25 | 25 | 150 | 12.5 | 25 | 20 | | | | | |
| RCGT 0803M0 | EH-SRDCN 1616-08 | 16 | 16 | 100 | 8 | 16 | 16 | SCR0307 | - | - | TW09P | |
| | 2020-08 | 20 | 20 | 125 | 10 | 20 | 20 | | | | | |
| | 2525-08 | 25 | 25 | 150 | 12.5 | 25 | 20 | | | | | |
| RCGT 1003M0 | EH-SRDCN 1616-10 | 16 | 16 | 100 | 8 | 16 | 25 | SCR03511A | SSR10 | SSCR0509 | TW15P,W35L | |
| | 2020-10 | 20 | 20 | 125 | 10 | 20 | 25 | | | | | |
| | 2525-10 | 25 | 25 | 150 | 12.5 | 25 | 25 | | | | | |
| RCGT 1204M0 | EH-SRDCN 2020-12 | 20 | 20 | 125 | 10 | 20 | 28 | SCR03512 | SSR12 | SSCR0509 | TW15P,W35L | |
| | 2525-12 | 25 | 25 | 150 | 12.5 | 25 | 28 | | | | | |

SRGC^{R/L}

Screw On

+ **RCGT**

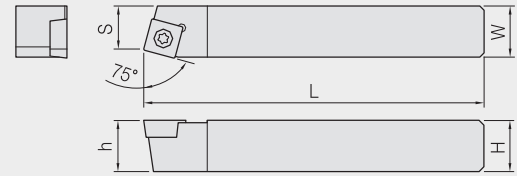


| Insert | Item No. | Dimensions (mm) | | | | | | | Screw | Shim | Shim Screw | Wrench |
|-------------|---------------------|-----------------|----|-----|----|----|---|-----------|-------|----------|------------|--------|
| | | H | W | L | S | h | ℓ | | | | | |
| RCGT 0602M0 | EH-SRGC R/L 1010-06 | 10 | 10 | 70 | 12 | 10 | - | SCR02565 | - | - | TW07P | |
| | 1212-06 | 12 | 12 | 80 | 16 | 12 | - | | | | | |
| | 1616-06 | 16 | 16 | 100 | 20 | 16 | - | | | | | |
| RCGT 0803M0 | EH-SRGC R/L 1616-08 | 16 | 16 | 100 | 20 | 16 | - | SCR0307 | - | - | TW09P | |
| | 2020-08 | 20 | 20 | 125 | 25 | 20 | - | | | | | |
| | 2525-08 | 25 | 25 | 150 | 32 | 25 | - | | | | | |
| RCGT 1003M0 | EH-SRGC R/L 1616-10 | 16 | 16 | 100 | 20 | 16 | - | SCR03511A | SSR10 | SSCR0509 | TW15P,W35L | |
| | 2020-10 | 20 | 20 | 125 | 25 | 20 | - | | | | | |
| | 2525-10 | 25 | 25 | 150 | 32 | 25 | - | | | | | |
| RCGT 1204M0 | EH-SRGC R/L 2020-12 | 20 | 20 | 125 | 25 | 20 | - | SCR03512 | SSR12 | SSCR0509 | TW15P,W35L | |
| | 2525-12 | 25 | 25 | 150 | 32 | 25 | - | | | | | |

SSBC^{R/L}

Screw On

+ **SC** □ □

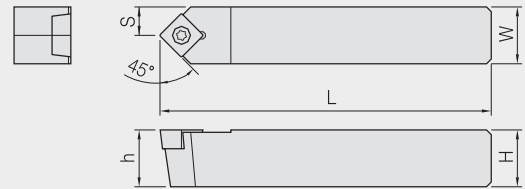


| Insert | Item No. | Dimensions (mm) | | | | | Screw | Shim | Shim Screw | Wrench |
|-----------------|---------------------|-----------------|----|-----|----|----|----------|-------|------------|------------|
| | | H | W | L | S | h | | | | |
| SC □ □ 09T3 □ □ | EH-SSBC R/L 1212-09 | 12 | 12 | 80 | 11 | 12 | SCR03508 | - | - | TW15P |
| | 1616-09 | 16 | 16 | 100 | 13 | 16 | SCR03512 | SSS32 | SSCR0509 | TW15P,W35L |
| SC □ □ 1204 □ □ | EH-SSBC R/L 2020-12 | 20 | 20 | 125 | 17 | 20 | SCR0411F | SSS42 | SSCR0610 | TW15P,W35L |

SSDCN

Screw On

+ **SC** □ □

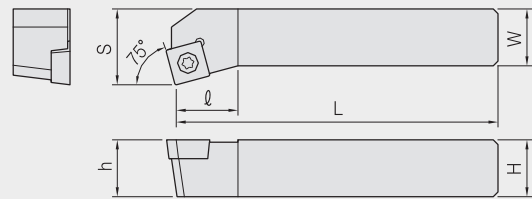


| Insert | Item No. | Dimensions (mm) | | | | | Screw | Shim | Shim Screw | Wrench |
|-----------------|------------------|-----------------|----|-----|---|----|----------|-------|------------|------------|
| | | H | W | L | S | h | | | | |
| SC □ □ 09T3 □ □ | EH-SSDCN 1212-09 | 12 | 12 | 80 | 6 | 12 | SCR03508 | - | - | TW15P |
| | 1616-09 | 16 | 16 | 100 | 8 | 16 | SCR03512 | SSS32 | SSCR0509 | TW15P,W35L |

SSKC^{R/L}

Screw On

+ **SC** □ □

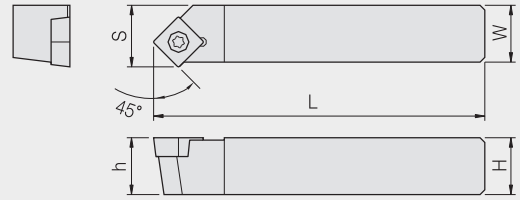


| Insert | Item No. | Dimensions (mm) | | | | | | | Screw | Shim | Shim Screw | Wrench |
|-----------------|---------------------|-----------------|----|-----|----|----|----|----------|-------|----------|------------|--------|
| | | H | W | L | S | h | l | | | | | |
| SC □ □ 09T3 □ □ | EH-SSKC R/L 1616-09 | 16 | 16 | 100 | 20 | 16 | 13 | SCR03512 | SSS32 | SSCR0509 | TW15P,W35L | |

SSSC^{R/L}

Screw On

+ **SC** □ □

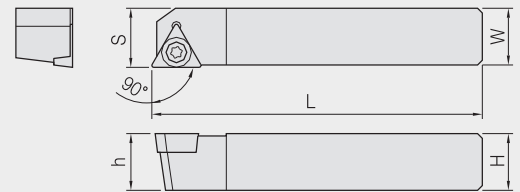


| Insert | Item No. | Dimensions (mm) | | | | | | Screw | Shim | Shim Screw | Wrench |
|-----------------|-------------|-----------------|----|----|-----|----|----|----------|-------|------------|------------|
| | | H | W | L | S | h | | | | | |
| SC □ □ 09T3 □ □ | EH-SSSC R/L | 1616-09 | 16 | 16 | 100 | 17 | 16 | SCR03512 | SSS32 | SSCR0509 | TW15P,W35L |
| SC □ □ 1204 □ □ | | 2020-12 | 20 | 20 | 125 | 21 | 20 | SCR0411F | SSS42 | SSCR0610 | TW15P,W40L |

STAC^{R/L}

Screw On

+ **TC** □ □

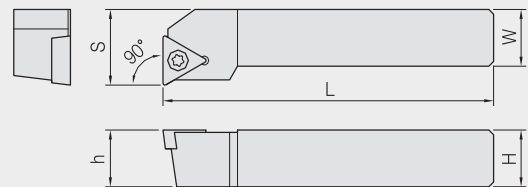


| Insert | Item No. | Dimensions (mm) | | | | | | Screw | Shim | Shim Screw | Wrench |
|-----------------|-------------|-----------------|----|----|----|------|----|----------|------|------------|--------|
| | | H | W | L | S | h | | | | | |
| TC □ □ 0902 □ □ | EH-STAC R/L | 1010-09 | 10 | 10 | 70 | 10.5 | 10 | SCR02206 | - | - | TW06P |
| TC □ □ 1102 □ □ | | 1212-11 | 12 | 12 | 80 | 12.5 | 12 | SCR02565 | - | - | TW07P |

STFC^{R/L}

Screw On

+ **TC** □ □

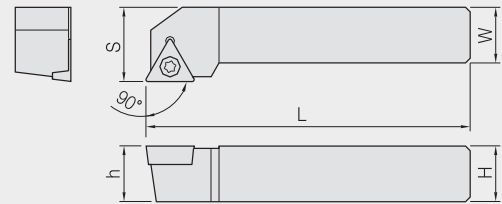


| Insert | Item No. | Dimensions (mm) | | | | | | | Screw | Shim | Shim Screw | Wrench |
|-----------------|-----------------|-----------------|----|-----|-----|----|----|----|----------|-------|------------|------------|
| | | H | W | L | S | h | ℓ | | | | | |
| TC □ □ 0902 □ □ | EH-STFC R/L | 1010-09 | 10 | 10 | 70 | 12 | 10 | 10 | SCR02206 | - | - | TW06P |
| TC □ □ 1102 □ □ | | 1212-11 | 12 | 12 | 80 | 16 | 12 | 14 | SCR02565 | - | - | W07P |
| | TC □ □ 16T3 □ □ | 1616-11 | 16 | 16 | 100 | 20 | 16 | 14 | | | | |
| EH-STFC R/L | | 1616-16 | 16 | 16 | 100 | 20 | 16 | 19 | SCR03512 | SST32 | SSCR0509 | TW15P,W35L |
| | 2020-16 | 20 | 20 | 125 | 25 | 20 | 19 | | | | | |

STGC^{R/L}

Screw On

+ **TC** □ □

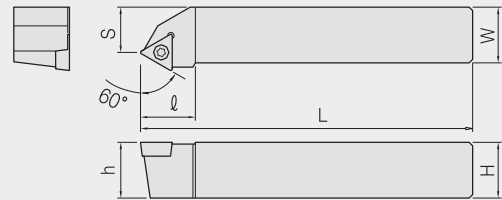


| Insert | Item No. | Dimensions (mm) | | | | | | Screw | Shim | Shim Screw | Wrench |
|------------|---------------------|-----------------|----|-----|----|----|----|----------|-------|------------|------------|
| | | H | W | L | S | h | q | | | | |
| TC□□0902□□ | EH-STGC R/L 0808-09 | 8 | 8 | 60 | 10 | 8 | 11 | SCR02206 | - | - | TW06P |
| | | 10 | 10 | 70 | 12 | 10 | 11 | | | | |
| TC□□1102□□ | EH-STGC R/L 1212-11 | 12 | 12 | 80 | 16 | 12 | 14 | SCR02565 | - | - | TW07P |
| | | 16 | 16 | 100 | 20 | 16 | 16 | | | | |
| TC□□15T3□□ | EH-STGC R/L 2020-16 | 20 | 20 | 125 | 25 | 20 | 21 | SCR03512 | SST32 | SSCR0509 | TW15P,W35L |
| | | 25 | 25 | 150 | 32 | 25 | 21 | | | | |

STTC^{R/L}

Screw On

+ **TC** □ □

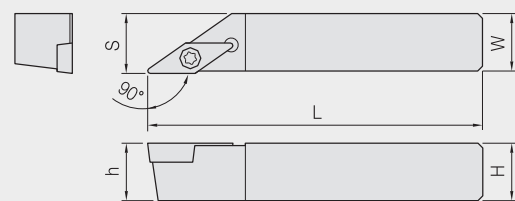


| Insert | Item No. | Dimensions (mm) | | | | | | Screw | Shim | Shim Screw | Wrench |
|------------|---------------------|-----------------|----|-----|----|----|----|----------|-------|------------|------------|
| | | H | W | L | S | h | q | | | | |
| TC□□1102□□ | EH-STTC R/L 1010-09 | 16 | 16 | 100 | 13 | 16 | 14 | SCR02565 | - | - | TW07P |
| TC□□16T3□□ | EH-STTC R/L 1212-11 | 16 | 16 | 100 | 13 | 16 | 19 | SCR03512 | SST32 | SSCR0509 | TW15P,W35L |
| | | 20 | 20 | 125 | 17 | 20 | 19 | | | | |

SVAB^{R/L}

Screw On

+ **VB** □ □

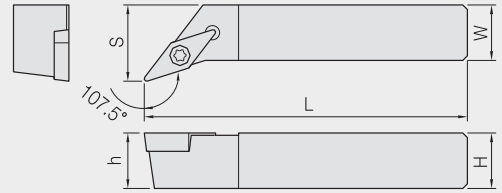


| Insert | Item No. | Dimensions (mm) | | | | | Screw | Shim | Shim Screw | Wrench |
|------------|---------------------|-----------------|----|-----|------|----|----------|-------|------------|------------|
| | | H | W | L | S | h | | | | |
| VB□□1604□□ | EH-SVAB R/L 1616-16 | 16 | 16 | 100 | 16.5 | 16 | SCR03512 | SSV32 | SSCR0509 | TW15P,W35L |
| | | 20 | 20 | 125 | 20.5 | 20 | | | | |

SVHB^{R/L}

Screw On

+ **VB** □ □

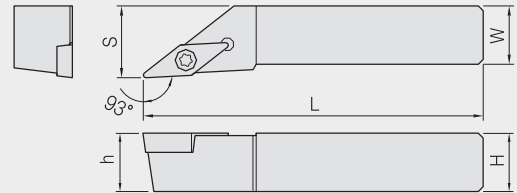


| Insert | Item No. | Dimensions (mm) | | | | | | Screw | Shim | Shim Screw | Wrench |
|-----------------|-------------|-----------------|----|----|-----|----|----|----------|-------|------------|------------|
| | | H | W | L | S | h | | | | | |
| VB □ □ 1604 □ □ | EH-SVHB R/L | 2525-16 | 25 | 25 | 150 | 32 | 25 | SCR03512 | SSV32 | SSCR0509 | TW15P,W35L |
| | | 3225-16 | 32 | 32 | 170 | 32 | 32 | | | | |

SVJB^{R/L}

Screw On

+ **VB** □ □

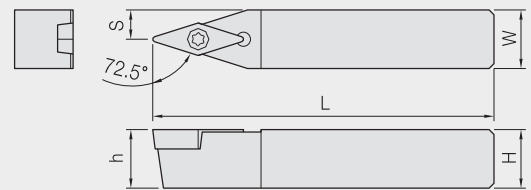


| Insert | Item No. | Dimensions (mm) | | | | | | | Screw | Shim | Shim Screw | Wrench |
|-----------------|-------------|-----------------|----|----|-----|----|----|----|----------|-------|------------|---------------|
| | | H | W | L | S | h | ℓ | | | | | |
| VB □ □ 1102 □ □ | EH-SVJB R/L | 1212-11 | 12 | 12 | 80 | 16 | 12 | 27 | SCR02565 | - | - | TW07P |
| | | 1616-11 | 16 | 16 | 100 | 20 | 16 | 27 | | | | |
| | | 2020-11 | 20 | 20 | 125 | 25 | 20 | 27 | | | | |
| VB □ □ 1604 □ □ | EH-SVJB R/L | 1616-16 | 16 | 16 | 100 | 20 | 16 | 36 | SCR03512 | SSV32 | SSCR0509 | TW15P W35L |
| | | 2020-16 | 20 | 20 | 125 | 25 | 20 | 41 | | | | |
| | | 2525-16 | 25 | 25 | 150 | 32 | 25 | 41 | | | | |
| | | 3225-16 | 32 | 25 | 170 | 32 | 32 | 55 | | | | |

SVVBN

Screw On

+ **VB** □ □

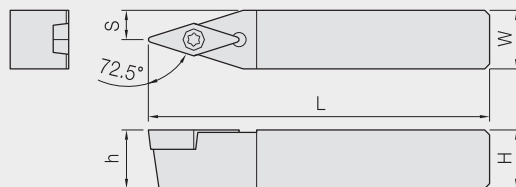


| Insert | Item No. | Dimensions (mm) | | | | | | | Screw | Shim | Shim Screw | Wrench |
|-----------------|----------|-----------------|----|----|-----|------|----|----------|-------|----------|---------------|--------|
| | | H | W | L | S | h | ℓ | | | | | |
| VB □ □ 1102 □ □ | EH-SVVBN | 1212-11 | 12 | 12 | 80 | 6 | 12 | SCR02565 | - | - | TW07P | |
| | | 1616-11 | 16 | 16 | 100 | 8 | 16 | | | | | |
| | | 2020-11 | 20 | 20 | 125 | 10 | 20 | | | | | |
| VB □ □ 1604 □ □ | EH-SVVBN | 1616-16 | 16 | 16 | 100 | 8 | 16 | SCR03512 | SSV32 | SSCR0509 | TW15P W35L | |
| | | 2020-16 | 20 | 20 | 125 | 10 | 20 | | | | | |
| | | 2525-16 | 25 | 25 | 150 | 12.5 | 25 | | | | | |
| | | 3225-16 | 32 | 25 | 170 | 12.5 | 32 | | | | | |

SVVCN

Screw On

+ **VC**□□□

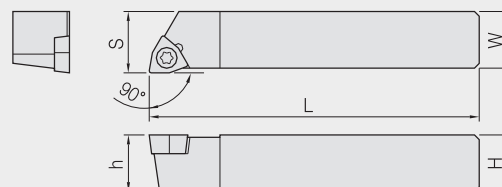


| Insert | Item No. | Dimensions (mm) | | | | | | Screw | Shim | Shim Screw | Wrench |
|------------|-----------------|-----------------|----|-----|------|----|---|----------|-------|------------|------------|
| | | H | W | L | S | h | | | | | |
| VC□□1103□□ | EH-SVCN 1212-11 | 12 | 12 | 80 | 6 | 12 | - | SCR02565 | - | - | TW07P |
| | 1616-11 | 16 | 16 | 100 | 8 | 16 | - | | | | |
| | 2020-11 | 20 | 20 | 125 | 10 | 20 | - | | | | |
| VC□□1303□□ | EH-SVCN 1212-13 | 12 | 12 | 80 | 6 | 12 | - | SCR0307 | - | - | TW09P |
| | 1616-13 | 16 | 16 | 100 | 8 | 16 | - | | | | |
| | 2020-13 | 20 | 20 | 125 | 10 | 20 | - | | | | |
| VC□□1604□□ | EH-SVCN 1616-16 | 16 | 16 | 100 | 6 | 16 | - | SCR03512 | SSV32 | SSCR0509 | TW15P,W35L |
| | 2020-16 | 20 | 20 | 125 | 8 | 20 | - | | | | |
| | 2525-16 | 25 | 25 | 150 | 12.5 | 25 | - | | | | |

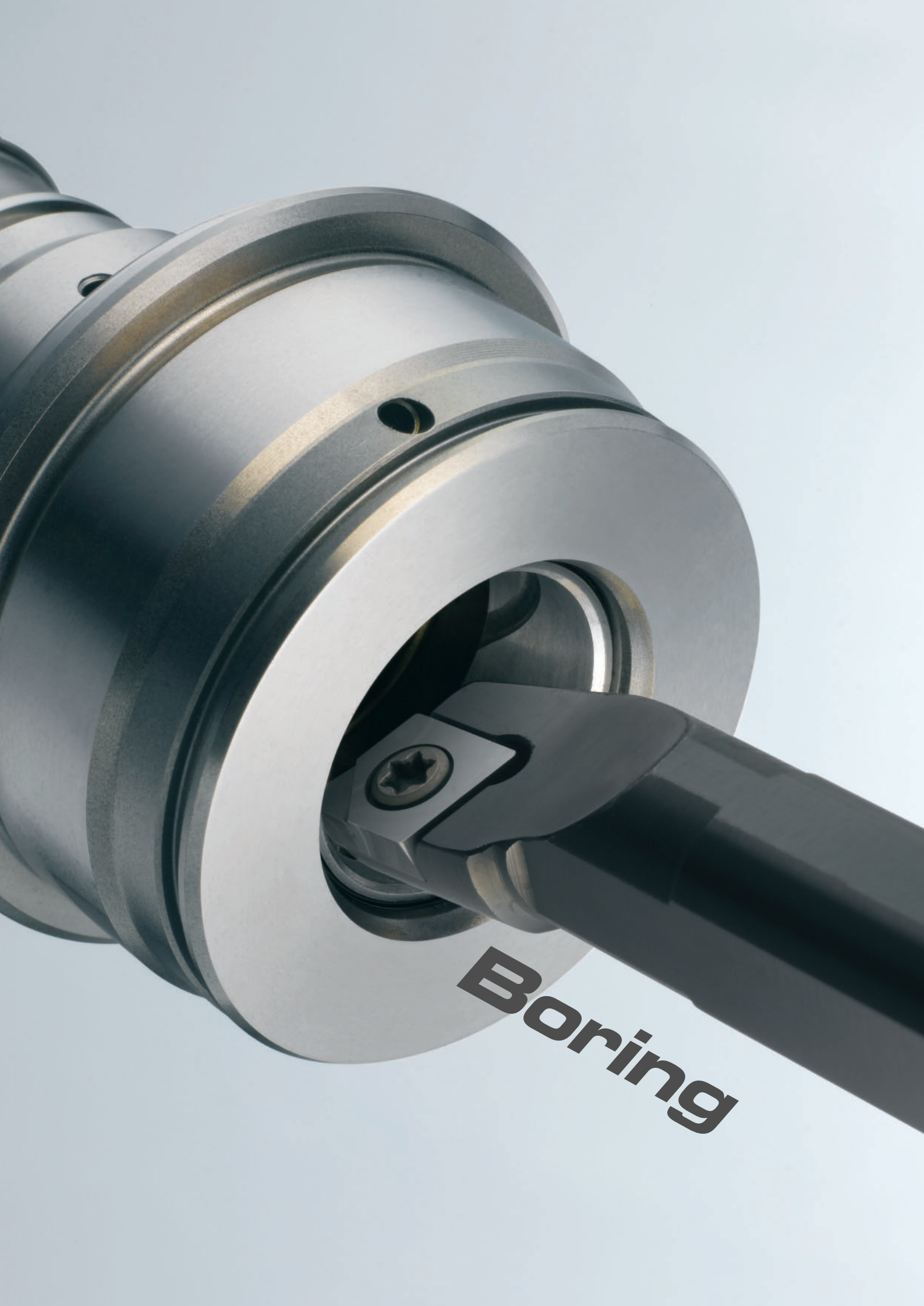
SWAC^{R/L}

Screw On

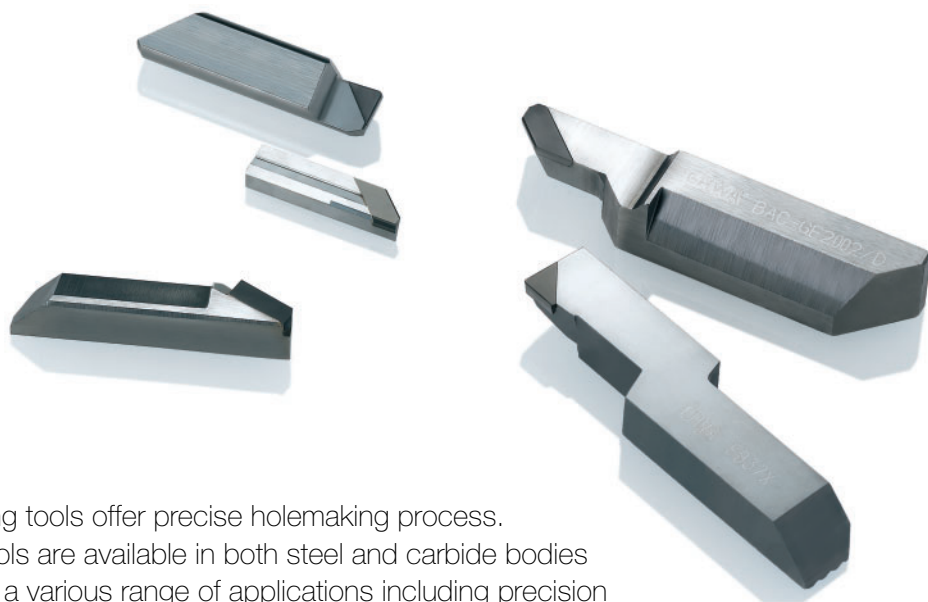
+ **WC**□□□



| Insert | Item No. | Dimensions (mm) | | | | | | Screw | Wrench |
|------------|---------------------|-----------------|----|-----|------|----|--|----------|--------|
| | | H | W | L | S | h | | | |
| WC□□0402□□ | EH-SWAC R/L 1010-04 | 10 | 10 | 70 | 10.1 | 10 | | SCR02565 | TW15P |
| | 1212-04 | 12 | 12 | 80 | 12.1 | 12 | | | |
| WC□□06T3□□ | EH-SWAC R/L 1616-06 | 16 | 16 | 100 | 16.1 | 16 | | SCR03508 | TW15P |
| WC□□0804□□ | EH-SWAC R/L 2020-08 | 20 | 20 | 125 | 20.1 | 20 | | SCR0411F | TW15P |



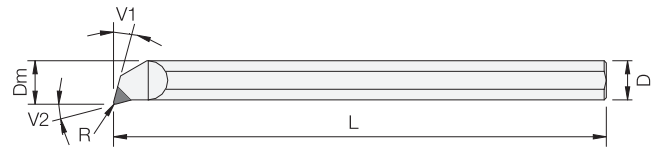
Boring



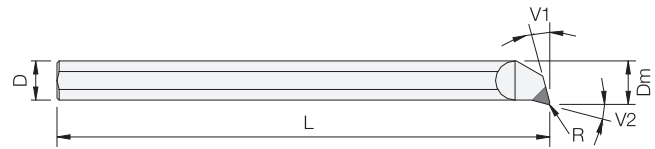
The EHWA boring tools offer precise holemaking process. These trustful tools are available in both steel and carbide bodies and are ideal for a various range of applications including precision micro boring.



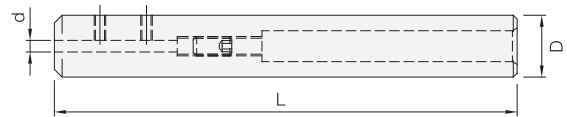
Boring



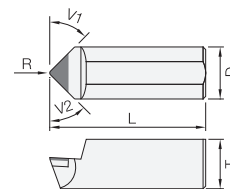
| Item No. | Dimensions (mm) | | | | | | |
|----------------------|-----------------|----|----|----|-----|-----|--|
| | R | V1 | V2 | L | D | Dm | |
| BSR 25 60 005 | 0.05 | 15 | 15 | 60 | 2.5 | 3 | |
| 25 60 01 | 0.1 | 15 | 15 | 60 | 2.5 | 3 | |
| 30 60 005 | 0.05 | 15 | 15 | 60 | 3 | 3.5 | |
| 30 60 01 | 0.1 | 15 | 15 | 60 | 3 | 3.5 | |
| 40 60 01 | 0.1 | 15 | 15 | 60 | 4 | 4.5 | |
| 40 60 02 | 0.2 | 15 | 15 | 60 | 4 | 4.5 | |
| 50 60 01 | 0.1 | 15 | 15 | 60 | 5 | 5.5 | |
| 50 60 02 | 0.2 | 15 | 15 | 60 | 5 | 5.5 | |
| 60 80 01 | 0.1 | 15 | 15 | 80 | 6 | 7 | |
| 60 80 02 | 0.2 | 15 | 15 | 80 | 6 | 7 | |



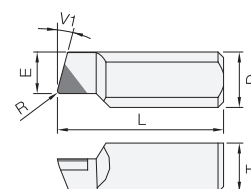
| Item No. | Dimensions (mm) | | | | | | |
|----------------------|-----------------|----|----|----|-----|-----|--|
| | R | V1 | V2 | L | D | Dm | |
| BSL 25 60 005 | 0.05 | 15 | 15 | 60 | 2.5 | 3 | |
| 25 60 01 | 0.1 | 15 | 15 | 60 | 2.5 | 3 | |
| 30 60 005 | 0.05 | 15 | 15 | 60 | 3 | 3.5 | |
| 30 60 01 | 0.1 | 15 | 15 | 60 | 3 | 3.5 | |
| 40 60 01 | 0.1 | 15 | 15 | 60 | 4 | 4.5 | |
| 40 60 02 | 0.2 | 15 | 15 | 60 | 4 | 4.5 | |
| 50 60 01 | 0.1 | 15 | 15 | 60 | 5 | 5.5 | |
| 50 60 02 | 0.2 | 15 | 15 | 60 | 5 | 5.5 | |
| 60 80 01 | 0.1 | 15 | 15 | 80 | 6 | 7 | |
| 60 80 02 | 0.2 | 15 | 15 | 80 | 6 | 7 | |



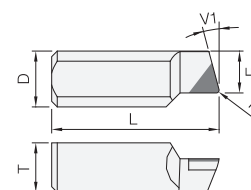
| Item No. | Dimensions (mm) | | | |
|-------------------|-----------------|-----|----|----|
| | d | L | H | D |
| SLV 16 025 | 2.5 | 100 | 14 | 16 |
| 16 03 | 3 | 100 | 14 | 16 |
| 16 04 | 4 | 100 | 14 | 16 |
| 16 05 | 5 | 100 | 14 | 16 |
| 16 06 | 6 | 100 | 14 | 16 |



| Item No. | Dimensions (mm) | | | | | |
|---------------------|-----------------|----|----|----|---|--|
| | R | V1 | V2 | L | D | |
| BRC 40 15 02 | 0.2 | 45 | 45 | 15 | 4 | |
| 40 15 04 | 0.4 | 45 | 45 | 15 | 4 | |
| 50 15 02 | 0.2 | 45 | 45 | 15 | 5 | |
| 50 15 04 | 0.4 | 45 | 45 | 15 | 5 | |
| 60 20 02 | 0.2 | 45 | 45 | 20 | 6 | |
| 60 20 04 | 0.4 | 45 | 45 | 20 | 6 | |
| 80 30 04 | 0.4 | 45 | 45 | 30 | 8 | |
| 80 30 08 | 0.8 | 45 | 45 | 30 | 8 | |

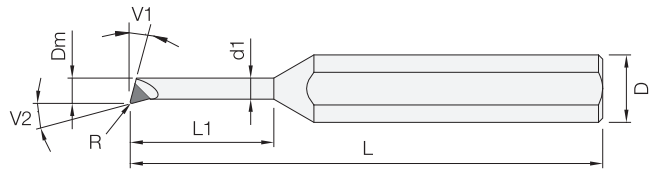


| Item No. | Dimensions (mm) | | | | | | |
|---------------------|-----------------|----|----|----|---|-----|--|
| | R | V1 | E | L | D | T | |
| BRR 40 15 02 | 0.2 | 15 | 15 | 15 | 4 | 3.5 | |
| 40 15 04 | 0.4 | 15 | 15 | 15 | 4 | 3.5 | |
| 50 15 02 | 0.2 | 15 | 15 | 15 | 5 | 4.5 | |
| 50 15 04 | 0.4 | 15 | 15 | 15 | 5 | 4.5 | |
| 60 20 02 | 0.2 | 20 | 20 | 20 | 6 | 5.5 | |
| 60 20 04 | 0.4 | 20 | 20 | 20 | 6 | 5.5 | |
| 80 30 04 | 0.4 | 30 | 30 | 30 | 8 | 7 | |
| 80 30 08 | 0.8 | 30 | 30 | 30 | 8 | 7 | |

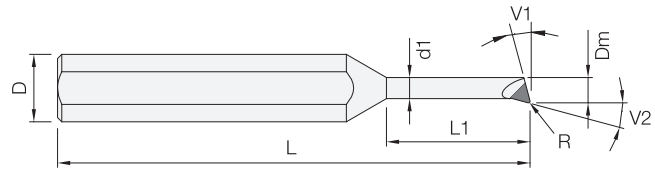


| Item No. | Dimensions (mm) | | | | | | |
|---------------------|-----------------|----|----|----|---|-----|--|
| | R | V1 | E | L | D | T | |
| BRL 40 15 02 | 0.2 | 15 | 15 | 15 | 4 | 3.5 | |
| 40 15 04 | 0.4 | 15 | 15 | 15 | 4 | 3.5 | |
| 50 15 02 | 0.2 | 15 | 15 | 15 | 5 | 4.5 | |
| 50 15 04 | 0.4 | 15 | 15 | 15 | 5 | 4.5 | |
| 60 20 02 | 0.2 | 20 | 20 | 20 | 6 | 5.5 | |
| 60 20 04 | 0.4 | 20 | 20 | 20 | 6 | 5.5 | |
| 80 30 04 | 0.4 | 30 | 30 | 30 | 8 | 7 | |
| 80 30 08 | 0.8 | 30 | 30 | 30 | 8 | 7 | |

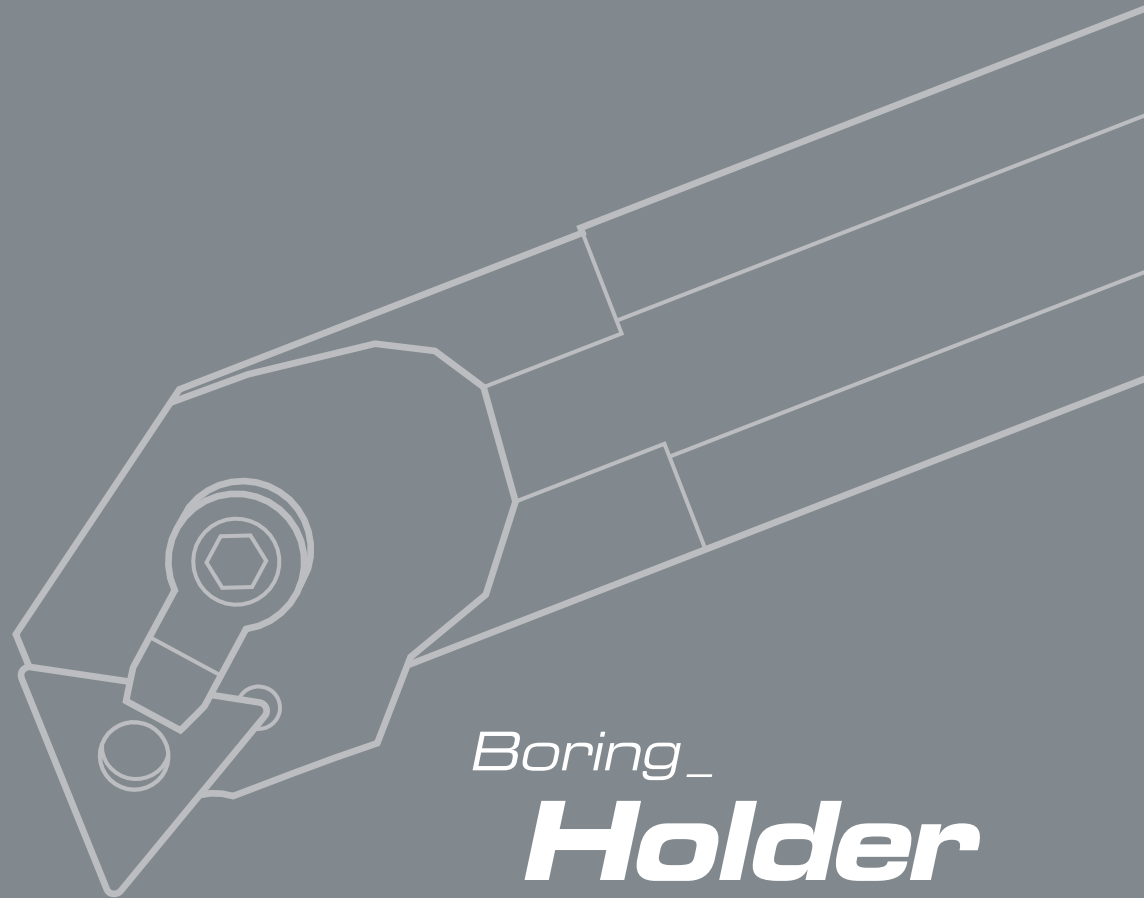
Boring



| Item No. | Dimensions (mm) | | | | | | | | |
|-----------------------|-----------------|----|----|-----|----|-----|----|----|----|
| | R | V1 | V2 | d1 | L1 | L | D | T | Dm |
| BRR2 35 100 01 | 0.1 | 15 | 15 | 3.5 | 30 | 100 | 16 | 15 | 4 |
| 35 100 02 | 0.2 | 15 | 15 | 3.5 | 30 | 100 | 16 | 15 | 4 |
| 45 100 01 | 0.1 | 15 | 15 | 4.5 | 30 | 100 | 16 | 15 | 5 |
| 45 100 02 | 0.2 | 15 | 15 | 4.5 | 30 | 100 | 16 | 15 | 5 |
| 55 100 01 | 0.1 | 15 | 15 | 5.5 | 40 | 100 | 16 | 15 | 6 |
| 55 100 02 | 0.2 | 15 | 15 | 5.5 | 40 | 100 | 16 | 15 | 6 |
| 65 100 02 | 0.2 | 15 | 15 | 6.5 | 40 | 100 | 16 | 15 | 7 |
| 65 100 04 | 0.4 | 15 | 15 | 6.5 | 40 | 100 | 16 | 15 | 7 |
| 75 100 02 | 0.2 | 15 | 15 | 7.5 | 40 | 100 | 16 | 15 | 8 |
| 75 100 04 | 0.4 | 15 | 15 | 7.5 | 40 | 100 | 16 | 15 | 8 |

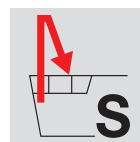
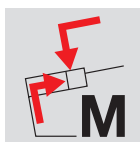
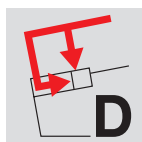


| Item No. | Dimensions (mm) | | | | | | | | |
|-----------------------|-----------------|----|----|-----|----|-----|----|----|----|
| | R | V1 | V2 | d1 | L1 | L | D | T | Dm |
| BRL2 35 100 01 | 0.1 | 15 | 15 | 3.5 | 30 | 100 | 16 | 15 | 4 |
| 35 100 02 | 0.2 | 15 | 15 | 3.5 | 30 | 100 | 16 | 15 | 4 |
| 45 100 01 | 0.1 | 15 | 15 | 4.5 | 30 | 100 | 16 | 15 | 5 |
| 45 100 02 | 0.2 | 15 | 15 | 4.5 | 30 | 100 | 16 | 15 | 5 |
| 55 100 01 | 0.1 | 15 | 15 | 5.5 | 40 | 100 | 16 | 15 | 6 |
| 55 100 02 | 0.2 | 15 | 15 | 5.5 | 40 | 100 | 16 | 15 | 6 |
| 65 100 02 | 0.2 | 15 | 15 | 6.5 | 40 | 100 | 16 | 15 | 7 |
| 65 100 04 | 0.4 | 15 | 15 | 6.5 | 40 | 100 | 16 | 15 | 7 |
| 75 100 02 | 0.2 | 15 | 15 | 7.5 | 40 | 100 | 16 | 15 | 8 |
| 75 100 04 | 0.4 | 15 | 15 | 7.5 | 40 | 100 | 16 | 15 | 8 |



Boring_
Holder

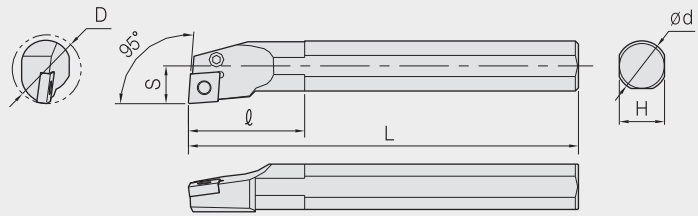
How to combine the holder



- D** Double clamping
- M** Multi locking
- P** Lever locking
- S** Screw clamping

PCLN^{R/L} Lever Locking

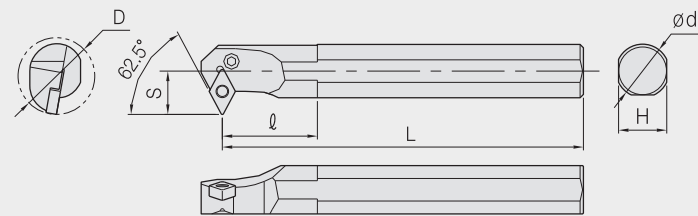
+ CN □ □



| Insert | Item No. | Dimensions (mm) | | | | | | Lever | Screw | Shim | Shim Pin | Shim pin punch | Wrench |
|-----------------|---------------------|-----------------|----|----|-----|----|----|-------|------------|---------|----------|----------------|--------|
| | | øD | ød | H | L | S | l | | | | | | |
| CN □ □ 0903 □ □ | EH-S16R-PCLN R/L-09 | 20 | 16 | 15 | 200 | 11 | 28 | LV3C | LVSCR0509B | - | - | - | W20L |
| | EH-S20S-PCLN R/L-09 | 25 | 20 | 18 | 250 | 19 | 32 | | | | | | |
| | EH-S25R-PCLN R/L-09 | 32 | 25 | 23 | 200 | 17 | 36 | | | | | | |
| CN □ □ 1204 □ □ | EH-S25R-PCLN R/L-12 | 32 | 25 | 23 | 200 | 17 | 40 | LV4A | LVSCR0613A | - | - | - | W25L |
| CN □ □ 1204 □ □ | EH-S32S-PCLN R/L-12 | 40 | 32 | 30 | 250 | 22 | 50 | LV4 | LVSCR0821 | LVSC42B | LVSP4 | LVSP4 | W30L |
| | EH-S40T-PCLN R/L-12 | 50 | 40 | 37 | 300 | 27 | 55 | | | | | | |
| | EH-S50U-PCLN R/L-12 | 63 | 50 | 47 | 350 | 35 | 55 | | | | | | |

PDSN^{R/L} Lever Locking

+ DN □ □

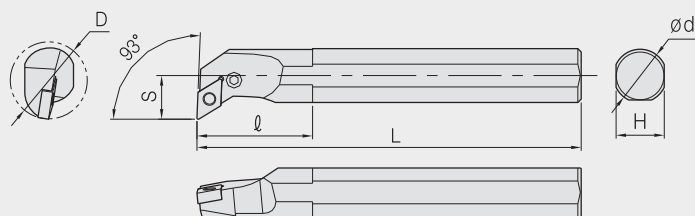


| Insert | Item No. | Dimensions (mm) | | | | | | Lever | Screw | Shim | Shim Pin | Shim pin punch | Wrench |
|-----------------|-----------------------|-----------------|----|----|-----|----|----|-------|-----------|--------|----------|----------------|--------|
| | | øD | ød | H | L | S | l | | | | | | |
| DN □ □ 1506 □ □ | EH-S32S-PDSN R/L-15 | 40 | 32 | 30 | 250 | 22 | 45 | LV4B | LVSCR0821 | LVSD42 | LVSP4 | LVSP4 | W30L |
| | EH-S40T-PDSN R/L-15 | 50 | 40 | 37 | 300 | 27 | 43 | | | | | | |
| DN □ □ 1504 □ □ | EH-S32S-PDSN R/L-15-3 | 40 | 32 | 30 | 450 | 22 | 45 | LV4 | LVSCR0821 | LVSD42 | LVSP4 | LVSP4 | W30L |
| | EH-S40T-PDSN R/L-15-3 | 50 | 40 | 37 | 300 | 27 | 43 | | | | | | |
| DN □ □ 1506 □ □ | EH-A32S-PDSN R/L-15 | 40 | 32 | 31 | 250 | 22 | 45 | LV4B | LVSCR0821 | LVSD42 | LVSP4 | LVSP4 | W30L |
| DN □ □ 1504 □ □ | EH-A32S-PDSN R/L-15-3 | 40 | 32 | 31 | 250 | 22 | 45 | LV4 | LVSCR0821 | LVSD42 | LVSP4 | LVSP4 | W30L |

PDUN^{R/L}

Lever Locking

+ **DN** □□ □□

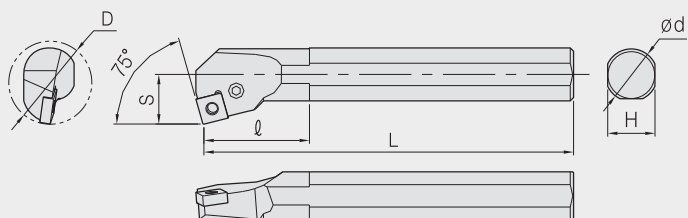


| Insert | Item No. | Dimensions (mm) | | | | | | Lever | Screw | Shim | Shim Pin | Shim pin punch | Wrench |
|--------------|-----------------------|-----------------|----|----|-----|----|----|-------|------------|---------|----------|----------------|--------|
| | | øD | ød | H | L | S | l | | | | | | |
| DN □□1104 □□ | EH-S20S-PDUN R/L-11 | 25 | 20 | 18 | 250 | 13 | 30 | LV3D | LVSCR0512B | - | - | - | W20L |
| | EH-S25R-PDUN R/L-11 | 32 | 25 | 23 | 200 | 17 | 35 | LV3 | LVSCR0617 | LVSD317 | LVSP3 | LVSP3 | W25L |
| | EH-S32S-PDUN R/L-11 | 40 | 32 | 30 | 250 | 22 | 40 | | | | | | |
| DN □□1506 □□ | EH-S32S-PDUN R/L-15 | 40 | 32 | 30 | 250 | 22 | 50 | LV4B | LVSCR0821 | LVSD42 | LVSP4 | LVSP4 | W30L |
| | EH-S40T-PDUN R/L-15 | 50 | 40 | 37 | 300 | 27 | 50 | | | | | | |
| | EH-S50U-PDUN R/L-15 | 63 | 50 | 47 | 350 | 35 | 63 | | | | | | |
| DN □□1504 □□ | EH-S32S-PDUN R/L-15-3 | 40 | 32 | 30 | 250 | 22 | 50 | LV4 | LVSCR0821 | LVSD42 | LVSP4 | LVSP4 | W30L |
| | EH-S40T-PDUN R/L-15-3 | 50 | 40 | 37 | 300 | 27 | 50 | | | | | | |
| DN □□1506 □□ | EH-A32S-PDUN R/L-15 | 40 | 32 | 31 | 250 | 22 | 50 | LV4B | LVSCR0821 | LVSD42 | LVSP4 | LVSP4 | W30L |
| DN □□1504 □□ | EH-A32S-PDUN R/L-15-3 | 40 | 32 | 31 | 250 | 22 | 50 | LV4 | LVSCR0821 | LVSD42 | LVSP4 | LVSP4 | W30L |

PSKN^{R/L}

Lever Locking

+ **SN** □□ □□

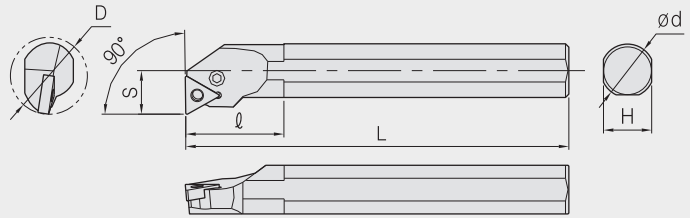


| Insert | Item No. | Dimensions (mm) | | | | | | Lever | Screw | Shim | Shim Pin | Shim pin punch | Wrench |
|--------------|---------------------|-----------------|----|----|-----|----|----|-------|------------|---------|----------|----------------|--------|
| | | øD | ød | H | L | S | l | | | | | | |
| SN □□1204 □□ | EH-S25R-PSKN R/L-12 | 32 | 25 | 23 | 200 | 17 | 42 | LV4A | LVSCR0613A | - | - | - | W25L |
| | EH-S32S-PSKN R/L-12 | 40 | 32 | 30 | 250 | 22 | 45 | LV4 | LVSCR0821 | LVSS42B | LVSP4 | LVSP4 | W30L |
| | EH-S40T-PSKN R/L-12 | 50 | 40 | 37 | 300 | 27 | 50 | | | | | | |
| SN □□1204 □□ | EH-A25R-PSKN R/L-12 | 32 | 25 | 23 | 200 | 17 | 42 | LV4A | LVSCR0613A | - | LVSP4 | - | W25L |
| SN □□1204 □□ | EH-A32S-PSKN R/L-12 | 40 | 32 | 30 | 250 | 22 | 50 | LV4 | LVSCR0821 | LVSS42B | LVSP4 | LVSP4 | W30L |

PTFN^{R/L}

Lever Locking

+ **TN** □ □

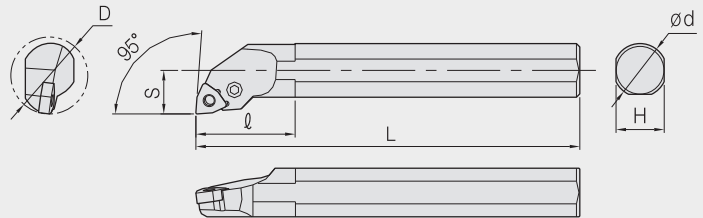


| Insert | Item No. | Dimensions (mm) | | | | | | Lever | Screw | Shim | Shim Pin | Shim pin punch | Wrench |
|-----------------|---------------------|-----------------|----|----|-----|----|----|-------|------------|----------|----------|----------------|--------|
| | | øD | ød | H | L | S | l | | | | | | |
| TN □ □ 1103 □ □ | EH-S16R-PTFN R/L-11 | 20 | 16 | 15 | 200 | 11 | 28 | | | | | | |
| | EH-S20S-PTFN R/L-11 | 25 | 20 | 18 | 250 | 13 | 33 | LV2 | LVSCR0509B | - | - | - | W25L |
| | EH-S25R-PTFN R/L-11 | 32 | 25 | 23 | 200 | 17 | 36 | | | | | | |
| TN □ □ 1604 □ □ | EH-S25R-PTFN R/L-16 | 32 | 25 | 23 | 200 | 17 | 42 | LV3B | LVSCR0512B | - | - | - | W20L |
| | EH-S32S-PTFN R/L-16 | 44 | 32 | 30 | 250 | 22 | 50 | | | | | | |
| | EH-S40T-PTFN R/L-16 | 54 | 40 | 37 | 300 | 27 | 55 | LV3 | LVSCR0617 | LVST317B | LVSP3 | LVSP3 | W25L |
| | EH-A25R-PTFN R/L-16 | 32 | 25 | 24 | 200 | 17 | 40 | | | | | | |
| | EH-A32S-PTFN R/L-16 | 40 | 32 | 31 | 250 | 22 | 50 | | | | | | |

PWLN^{R/L}

Lever Locking

+ **WN** □ □

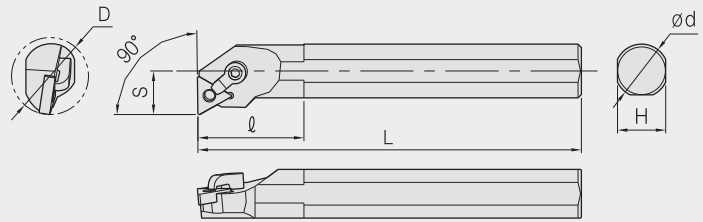


| Insert | Item No. | Dimensions (mm) | | | | | | Lever | Screw | Shim | Shim Pin | Shim pin punch | Wrench |
|-----------------|---------------------|-----------------|----|----|-----|----|----|-------|------------|---------|----------|----------------|--------|
| | | øD | ød | H | L | S | l | | | | | | |
| WN □ □ 0604 □ □ | EH-S20S-PWLN R/L-06 | 25 | 20 | 18 | 250 | 13 | 40 | | | | | | |
| | EH-S25R-PWLN R/L-06 | 32 | 25 | 23 | 200 | 17 | 40 | LV3B | LVSCR0512B | - | - | - | W20L |
| | EH-S32S-PWLN R/L-06 | 44 | 32 | 30 | 250 | 22 | 45 | LV3B | LVSCR0613B | LVSW317 | LVSP3 | LVSP3 | W25L |
| WN □ □ 0804 □ □ | EH-S25R-PWLN R/L-08 | 32 | 25 | 23 | 200 | 17 | 45 | LV4A | LVSCR0613A | - | - | - | W25L |
| | EH-S32S-PWLN R/L-08 | 44 | 32 | 30 | 250 | 22 | 50 | LV4 | LVSCR0821 | LVSW42 | LVSP4 | LVSP3 | W30L |

MTFN^{R/L}

Multi Locking

+ **TN** □ □

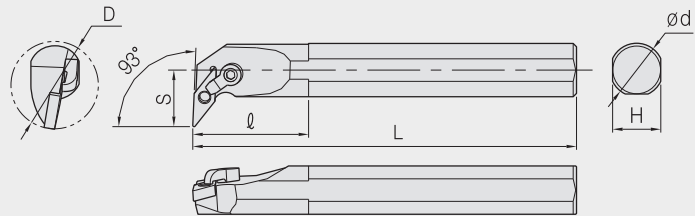


| Insert | Item No. | Dimensions (mm) | | | | | | Clamp | Clamp Screw | Shim | Shim Pin | Wrench |
|-----------------|---------------------|-----------------|----|----|-----|----|----|--------|---------------|--------|----------|--------|
| | | øD | ød | H | L | S | l | | | | | |
| TN □ □ 1604 □ □ | EH-S25R-MTFN R/L-16 | 32 | 25 | 23 | 200 | 17 | 36 | MCL7N1 | MCSCR10-32-19 | - | MSP3D3 | W23.8L |
| | EH-S32S-MTFN R/L-16 | 40 | 32 | 30 | 250 | 22 | 50 | | | MST32D | MSP3D | W19.8L |
| | EH-S40T-MTFN R/L-16 | 50 | 40 | 37 | 300 | 27 | 60 | | | - | MSP3D3 | W23.8L |
| | EH-A25R-MTFN R/L-16 | 32 | 25 | 23 | 200 | 17 | 40 | | | MST32D | MSP3D | W19.8L |
| | EH-A32S-MTFN R/L-16 | 40 | 32 | 30 | 250 | 22 | 50 | | | - | MSP3D3 | W23.8L |

MVUN^{R/L}

Multi Locking

+ **VN** □ □

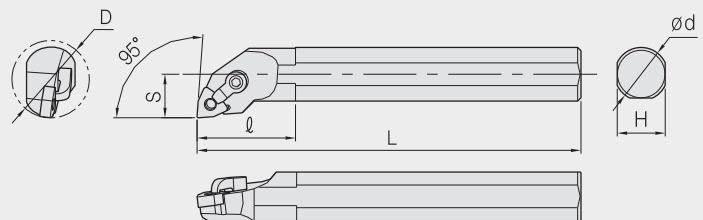


| Insert | Item No. | Dimensions (mm) | | | | | | Clamp | Clamp Screw | Shim | Shim Pin | Wrench |
|-----------------|---------------------|-----------------|----|----|-----|----|----|--------|--------------|-------|----------|------------------|
| | | øD | ød | H | L | S | l | | | | | |
| VN □ □ 1604 □ □ | EH-S32S-MVUN R/L-16 | 40 | 32 | 30 | 250 | 22 | 50 | MCL8N2 | MCSCR5/16-28 | MSV32 | MSP3D | W39.7L W19.8L |
| | EH-S40T-MVUN R/L-16 | 50 | 40 | 37 | 300 | 27 | 60 | | | | | |
| | EH-A32S-MVUN R/L-16 | 40 | 32 | 30 | 250 | 22 | 50 | | | | | |
| | EH-A40T-MVUN R/L-16 | 50 | 40 | 37 | 300 | 27 | 60 | | | | | |

MWLN^{R/L}

Multi Locking

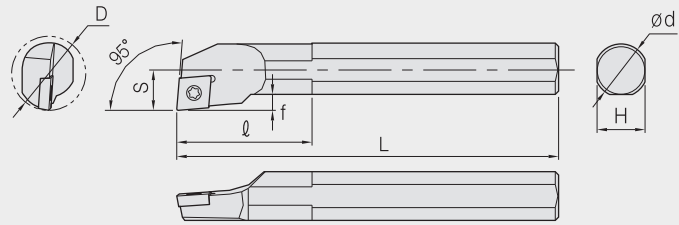
+ **WN** □ □



| Insert | Item No. | Dimensions (mm) | | | | | | Clamp | Clamp Screw | Shim | Shim Pin | Wrench |
|-----------------|---------------------|-----------------|----|----|-----|----|----|-------|---------------|-------|----------|--------|
| | | øD | ød | H | L | S | l | | | | | |
| WN □ □ 0604 □ □ | EH-S25R-MWLN R/L-06 | 32 | 25 | 23 | 200 | 17 | 36 | MCL7N | MCSCR10/32-19 | - | MSP3D3 | W23.8L |
| | EH-S32S-MWLN R/L-06 | 40 | 32 | 30 | 250 | 22 | 50 | | | MSW32 | MSP3D | |
| | EH-S40T-MWLN R/L-06 | 50 | 40 | 37 | 300 | 27 | 60 | | | - | MSP4DS | W31.8L |
| WN □ □ 0804 □ □ | EH-S25R-MWLN R/L-08 | 32 | 25 | 23 | 200 | 17 | 36 | MCL6N | MCSCR1/4-21 | - | MSP4D | W23.8L |
| | EH-S32S-MWLN R/L-08 | 40 | 32 | 30 | 250 | 22 | 50 | | | MSW43 | MSP4D | |
| | EH-S40T-MWLN R/L-08 | 50 | 40 | 37 | 300 | 27 | 60 | | | - | MSP4D | W23.8L |

SCLC^{R/L} Screw On

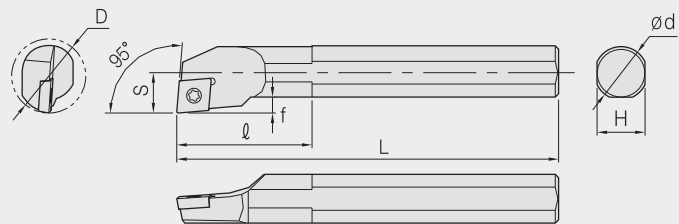
+ **CC** □ □



| Insert | Item No. | Dimensions (mm) | | | | | | Screw | Shim | Shim Screw | Wrench |
|-----------------|---------------------|-----------------|----|-----|-----|----|------|----------|-------|------------|---------------|
| | | øD | ød | H | L | S | l | | | | |
| CC □ □ 0602 □ □ | EH-S08K SCLC R/L 06 | 10 | 8 | 7 | 125 | 5 | 14 | SCR02555 | | | |
| | EH-S10K SCLC R/L 06 | 12 | 10 | 9 | 125 | 6 | 14 | | | | |
| | EH-S10M SCLC R/L 06 | 12 | 10 | 9 | 150 | 6 | 14 | SCR02565 | - | - | TW07P |
| | EH-S12M SCLC R/L 06 | 16 | 12 | 11 | 150 | 9 | 25 | | | | |
| CC □ □ 09T3 □ □ | EH-S16R SCLC R/L 06 | 20 | 16 | 15 | 200 | 11 | 32 | | | | |
| | EH-S12M SCLC R/L 09 | 16 | 12 | 11 | 150 | 9 | 25 | | | | |
| | EH-S16R SCLC R/L 09 | 20 | 16 | 15 | 200 | 11 | 32.5 | SCR03508 | - | - | TW15P |
| | EH-S20S SCLC R/L 09 | 25 | 20 | 18 | 250 | 13 | 38 | | | | |
| CC □ □ 1204 □ □ | EH-S25R SCLC R/L 09 | 32 | 25 | 23 | 200 | 17 | 45 | SCR03510 | | | |
| | EH-S25R SCLC R/L 12 | 32 | 25 | 23 | 200 | 17 | 45 | | - | - | TW15P |
| | EH-S32S SCLC R/L 12 | 40 | 32 | 30 | 250 | 22 | 50 | SCR0411F | SSC42 | SSCR0610 | W40L TW15P |
| CC □ □ 0602 □ □ | EH-S40T SCLC R/L 12 | 50 | 40 | 37 | 300 | 27 | 60 | | | | |
| | EH-A08F SCLC R/L 06 | 10 | 8 | 7.5 | 80 | 5 | 14 | SCR02555 | | | |
| | EH-A10H SCLC R/L 06 | 12 | 10 | 9.5 | 100 | 6 | 14 | SCR02565 | - | - | TW07P |
| CC □ □ 09T3 □ □ | EH-A12K SCLC R/L 06 | 16 | 12 | 11 | 125 | 9 | 25 | | | | |
| | EH-A12K SCLC R/L 09 | 16 | 12 | 11 | 125 | 9 | 25 | | | | |
| | EH-A16M SCLC R/L 09 | 20 | 16 | 15 | 150 | 11 | 32.5 | SCR03508 | - | - | TW15P |
| | EH-A20Q SCLC R/L 09 | 25 | 20 | 19 | 180 | 13 | - | | | | |
| CC □ □ 1204 □ □ | EH-A25R SCLC R/L 09 | 32 | 25 | 24 | 200 | 17 | 45 | SCR03510 | | | |
| | EH-A25R SCLC R/L 12 | 32 | 25 | 24 | 200 | 17 | 45 | SCR0411F | - | - | TW15P |
| | EH-A32S SCLC R/L 12 | 40 | 32 | 31 | 250 | 32 | 50 | | SSC42 | SSCR0610 | W40L, TW15P |

SCLP^{R/L} Screw On

+ **CP** □ □

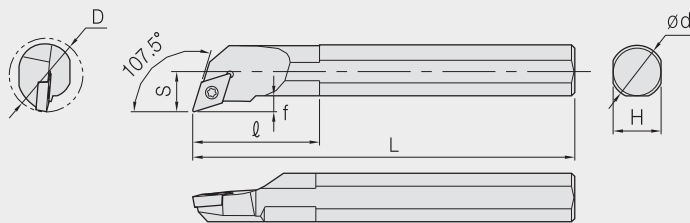


| Insert | Item No. | Dimensions (mm) | | | | | | Screw | Wrench |
|-----------------|---------------------|-----------------|----|-----|-----|------|----|---------|--------|
| | | øD | ød | H | L | S | l | | |
| CP □ □ 0802 □ □ | EH-S10M SCLP R/L 08 | 12 | 10 | 9 | 150 | 6 | - | SCR0305 | |
| | EH-S12M SCLP R/L 08 | 16 | 12 | 11 | 150 | 8 | 15 | SCR0307 | TW09P |
| CP □ □ 0903 □ □ | EH-S16N SCLP R/L 09 | 20 | 16 | 15 | 160 | 10 | 15 | | |
| | EH-S16R SCLP R/L 09 | 20 | 16 | 15 | 200 | 11 | 35 | SCR0408 | TW15P |
| | EH-S20N SCLP R/L 09 | 25 | 20 | 18 | 160 | 12.5 | 20 | | |
| CP □ □ 0802 □ □ | EH-S20S SCLP R/L 09 | 25 | 20 | 15 | 250 | 12.5 | 20 | | |
| | EH-A10H SCLP R/L 08 | 12 | 10 | 9.5 | 100 | 9 | - | SCR0305 | |
| CP □ □ 0903 □ □ | EH-A12K SCLP R/L 08 | 16 | 12 | 11 | 125 | 8 | 20 | SCR0307 | TW09P |
| | EH-A16M SCLP R/L 09 | 20 | 16 | 15 | 150 | 10 | 25 | SCR0408 | TW15P |
| | EH-A20Q SCLP R/L 09 | 25 | 20 | 19 | 180 | 12.5 | 28 | | |

SDQC^{R/L}

Screw On

+ DC □□

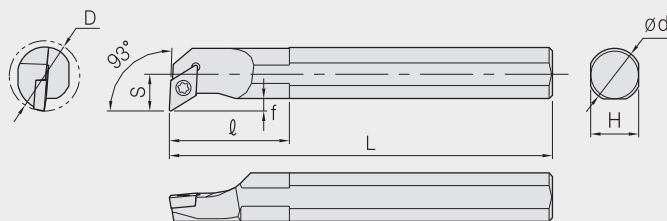


| Insert | Item No. | Dimensions (mm) | | | | | | | Screw | Wrench |
|-------------|----------------------|-----------------|----|-----|-----|----|----|-----|----------|--------|
| | | ØD | Ød | H | L | S | l | f | | |
| DC □□0702□□ | EH-S10M-SDQCR R/L-07 | 13 | 10 | 9 | 150 | 7 | 20 | 2.5 | SCR02555 | TW07P |
| | EH-S12M-SDQCR R/L-07 | 16 | 12 | 11 | 150 | 9 | 22 | 3.5 | SCR02565 | |
| | EH-S16R-SDQCR R/L-07 | 20 | 16 | 15 | 200 | 11 | 27 | 4 | SCR03508 | |
| DC □□11T3□□ | EH-S16R-SDQCR R/L-11 | 20 | 16 | 15 | 200 | 11 | 32 | 4 | SCR03508 | TW15P |
| | EH-S20S-SDQCR R/L-11 | 25 | 20 | 18 | 250 | 13 | 32 | 4.5 | SCR03510 | |
| | EH-S25R-SDQCR R/L-11 | 32 | 25 | 23 | 200 | 17 | 32 | 7 | SCR03510 | |
| DC □□0702□□ | EH-A10H-SDQCR R/L-07 | 13 | 10 | 9.5 | 100 | 7 | 20 | 2 | SCR02555 | TW07P |
| | EH-A12K-SDQCR R/L-07 | 16 | 12 | 11 | 125 | 9 | 22 | 3 | SCR02565 | |
| DC □□11T3□□ | EH-A16M-SDQCR R/L-11 | 20 | 16 | 15 | 150 | 11 | 27 | 3 | SCR03508 | TW15P |
| | EH-A20Q-SDQCR R/L-11 | 25 | 20 | 19 | 180 | 13 | 32 | 3 | SCR03510 | |
| | EH-A25R-SDQCR R/L-11 | 32 | 25 | 24 | 200 | 17 | 32 | 4 | SCR03510 | |

SDUC^{R/L}

Screw On

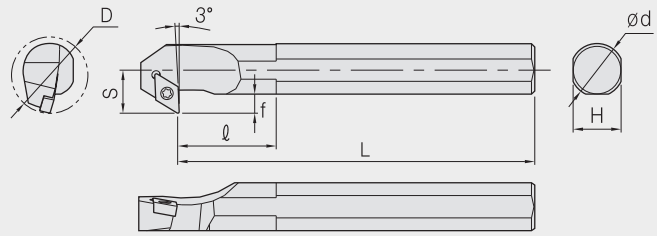
+ DC □□



| Insert | Item No. | Dimensions (mm) | | | | | | | Screw | Wrench |
|-------------|----------------------|-----------------|----|-----|-----|----|----|-----|----------|--------|
| | | ØD | Ød | H | L | S | l | f | | |
| DC □□0702□□ | EH-S10M-SDUCR R/L-07 | 13 | 10 | 9 | 150 | 7 | 0 | 2.5 | SCR02555 | TW07P |
| | EH-S12M-SDUCR R/L-07 | 16 | 12 | 11 | 150 | 9 | 22 | 3.5 | SCR02565 | |
| | EH-S16R-SDUCR R/L-07 | 20 | 16 | 15 | 200 | 11 | 27 | 4 | SCR03508 | |
| DC □□11T3□□ | EH-S16R-SDUCR R/L-11 | 20 | 16 | 15 | 200 | 11 | 27 | 4 | SCR03508 | TW15P |
| | EH-S20S-SDUCR R/L-11 | 25 | 20 | 18 | 250 | 13 | 35 | 4.3 | SCR03510 | |
| | EH-S25R-SDUCR R/L-11 | 32 | 25 | 23 | 200 | 17 | 46 | 6.8 | SCR03510 | |
| DC □□0702□□ | EH-S32S-SDUCR R/L-11 | 40 | 32 | 30 | 250 | 22 | 50 | 8.4 | SCR03510 | TW15P |
| | EH-A10H-SDUCR R/L-07 | 13 | 10 | 9.5 | 100 | 7 | 0 | 2 | SCR02555 | |
| | EH-A12K-SDUCR R/L-07 | 16 | 12 | 11 | 125 | 9 | 22 | 3 | SCR02565 | |
| DC □□11T3□□ | EH-A16M-SDUCR R/L-07 | 20 | 16 | 15 | 150 | 11 | 27 | 3 | SCR02565 | TW07P |
| | EH-A20Q-SDUCR R/L-11 | 25 | 20 | 19 | 180 | 13 | 35 | 3 | SCR03508 | |
| | EH-A25R-SDUCR R/L-11 | 32 | 25 | 24 | 200 | 17 | 46 | 4.5 | SCR03510 | |

SDZC^{R/L} Screw On

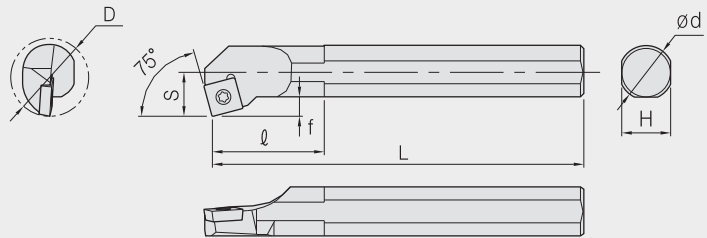
+ DC □□



| Insert | Item No. | Dimensions (mm) | | | | | | | Screw | Shim | Shim Screw | Wrench |
|------------|---------------------|-----------------|----|----|-----|----|------|-----|----------|-------|------------|------------|
| | | øD | ød | H | L | S | l | f | | | | |
| DC□□0702□□ | EH-S16R SDZC R/L 07 | 20 | 16 | 15 | 200 | 11 | 29 | 4 | SCR02565 | - | - | TW07P |
| | EH-S20S SDZC R/L 07 | 25 | 20 | 18 | 250 | 13 | 36.5 | 4.5 | | | | |
| DC□□11T3□□ | EH-S25R SDZC R/L 11 | 32 | 25 | 23 | 200 | 17 | 30 | 6.9 | SCR03510 | - | - | TW15P |
| | EH-S32S SDZC R/L 11 | 40 | 32 | 30 | 250 | 22 | 39 | 8.4 | SCR03512 | SSD32 | SSCR0509 | TW15P,W35L |
| | EH-S40T SDZC R/L 11 | 50 | 40 | 37 | 300 | 27 | 47 | 9.4 | SCR03510 | - | - | TW15P |
| | EH-A25R SDZC R/L 11 | 32 | 25 | 24 | 200 | 17 | 30 | 4.5 | SCR03512 | SSD32 | SSCR0509 | TW15P,W35L |

SSKC^{R/L} Screw On

+ SC □□

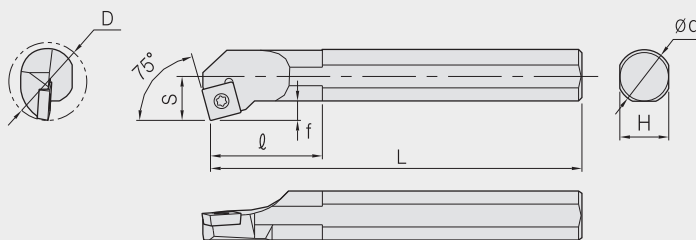


| Insert | Item No. | Dimensions (mm) | | | | | | | Screw | Shim | Shim Screw | Wrench |
|------------|---------------------|-----------------|----|----|-----|----|----|---|----------|-------|------------|------------|
| | | øD | ød | H | L | S | l | f | | | | |
| SC□□09T3□□ | EH-S12M SSKC R/L 09 | 16 | 20 | 11 | 150 | 9 | 26 | | SCR03507 | | | |
| | EH-S16R SSKC R/L 09 | 20 | 16 | 15 | 200 | 11 | 40 | | SCR03508 | - | - | TW15P |
| | EH-S20S SSKC R/L 09 | 25 | 20 | 18 | 250 | 13 | 46 | | | | | |
| SC□□1204□□ | EH-S25R SSKC R/L 12 | 32 | 25 | 23 | 200 | 17 | 36 | | SCR0411F | | | TW15P |
| | EH-S32S SSKC R/L 12 | 40 | 32 | 30 | 250 | 22 | 43 | | SCR0411F | SSC42 | SSCR0610 | TW15P,W40L |
| SC□□09T3□□ | EH-A12K SSKC R/L 09 | 16 | 12 | 11 | 125 | 9 | 26 | | SCR03507 | | | |
| | EH-A16M SSKC R/L 09 | 20 | 16 | 15 | 150 | 11 | 32 | | SCR03508 | - | - | TW15P |
| | EH-A20Q SSKC R/L 09 | 25 | 20 | 19 | 180 | 13 | 34 | | | | | |
| SC□□1204□□ | EH-A25R SSKC R/L 12 | 32 | 25 | 24 | 200 | 17 | 36 | | SCR0411F | SSC42 | SSCR0610 | TW15P |
| | EH-A32S SSKC R/L 12 | 40 | 32 | 31 | 250 | 22 | 43 | | | | | TW15P,W40L |

SSKP^{R/L}

Screw On

+ SP □□

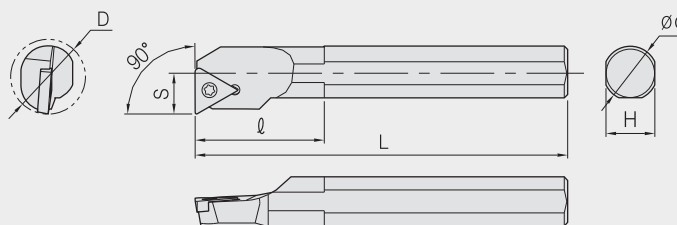


| Insert | Item No. | Dimensions (mm) | | | | | | Screw | Wrench |
|------------|---------------------|-----------------|----|----|-----|------|----|----------|--------|
| | | øD | ød | H | L | S | l | | |
| SP□□0903□□ | EH-S12M SSKP R/L 09 | 16 | 12 | 11 | 150 | 8 | 18 | SCR0307 | TW09P |
| | EH-S16N SSKP R/L 09 | 20 | 16 | 15 | 160 | 10 | 30 | | |
| | EH-S16R SSKP R/L 09 | 20 | 16 | 15 | 200 | 10 | 32 | | |
| | EH-S20N SSKP R/L 09 | 25 | 20 | 18 | 160 | 12.5 | 32 | | |
| | EH-S20S SSKP R/L 09 | 25 | 20 | 18 | 250 | 12.5 | 35 | | |
| SP□□0903□□ | EH-A12K SSKP R/L 09 | 16 | 12 | 11 | 125 | 8 | 21 | SCR03508 | TW09P |
| | EH-A16M SSKP R/L 09 | 20 | 16 | 15 | 150 | 10 | 30 | SCR0307 | |
| | EH-A20Q SSKP R/L 09 | 25 | 20 | 19 | 180 | 12.5 | 32 | SCR0307 | |

STFC^{R/L}

Screw On

+ TC □□

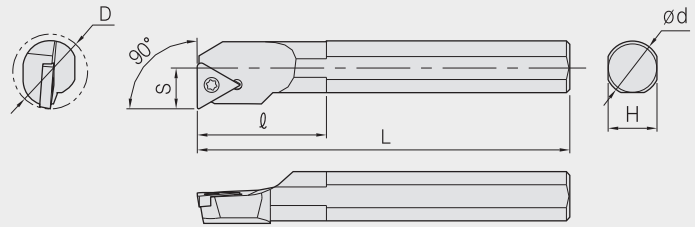


| Insert | Item No. | Dimensions (mm) | | | | | | Screw | Shim | Shim Screw | Wrench |
|------------|---------------------|-----------------|----|-----|-----|----|----|----------|-------|------------|------------|
| | | øD | ød | H | L | S | l | | | | |
| TC□□0902□□ | EH-S10M STFC R/L 09 | 13 | 10 | 9 | 150 | 7 | 23 | SCR02206 | - | - | TW06P |
| | EH-S12M STFC R/L 09 | 16 | 12 | 11 | 150 | 9 | 28 | | | | |
| TC□□1102□□ | EH-S12M STFC R/L 11 | 16 | 12 | 11 | 150 | 9 | 30 | SCR02565 | - | - | TW07P |
| | EH-S16R STFC R/L 11 | 20 | 16 | 15 | 200 | 11 | 35 | | | | |
| | EH-S20S STFC R/L 11 | 25 | 20 | 18 | 250 | 13 | 36 | | | | |
| TC□□16T3□□ | EH-S20S STFC R/L 16 | 25 | 20 | 18 | 250 | 13 | 36 | SCR03510 | - | - | TW15P |
| | EH-S25R STFC R/L 16 | 32 | 25 | 23 | 200 | 17 | 49 | | | | |
| TC□□16T3□□ | EH-S32S STFC R/L 16 | 40 | 32 | 30 | 250 | 22 | 50 | SCR03512 | SST32 | SSCR0509 | TW15P,W35L |
| | EH-S40T STFC R/L 16 | 50 | 40 | 37 | 300 | 27 | 60 | | | | |
| TC□□0902□□ | EH-A10M STFC R/L 09 | 13 | 10 | 9.5 | 100 | 7 | 23 | SCR02206 | - | - | TW06P |
| | EH-A12K STFC R/L 09 | 16 | 12 | 11 | 125 | 9 | 23 | | | | |
| | EH-A12K STFC R/L 11 | 16 | 12 | 11 | 125 | 9 | 30 | | | | |
| TC□□1102□□ | EH-A16M STFC R/L 11 | 20 | 16 | 15 | 150 | 11 | 30 | SCR02565 | - | - | TW07P |
| | EH-A20Q STFC R/L 11 | 25 | 20 | 19 | 180 | 13 | 36 | | | | |
| TC□□16T3□□ | EH-A25R STFC R/L 16 | 32 | 25 | 24 | 200 | 17 | 49 | SCR03510 | - | - | TW15P |
| | EH-A32S STFC R/L 16 | 40 | 32 | 31 | 250 | 22 | 50 | | | | |

STFP^{R/L}

Screw On

+ **TP** □ □

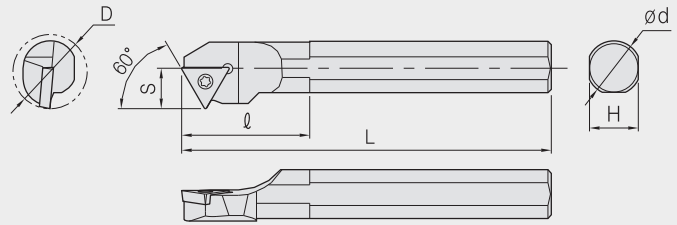


| Insert | Item No. | Dimensions (mm) | | | | | | Screw | Wrench |
|------------|---------------------|-----------------|----|-----|-----|------|----|-----------|--------|
| | | øD | ød | H | L | S | l | | |
| TP□□1103□□ | EH-S10M STFP R/L 11 | 12 | 10 | 9 | 150 | 6 | - | SCR030508 | TW09P |
| | EH-S12M STFP R/L 11 | 16 | 12 | 11 | 150 | 8 | 10 | SCR0307 | TW09P |
| | EH-S16N STFP R/L 11 | 20 | 16 | 15 | 160 | 10 | 12 | | |
| | EH-S16R STFP R/L 11 | 20 | 16 | 15 | 200 | 10 | 12 | | |
| TP□□1604□□ | EH-S20N STFP R/L 16 | 25 | 20 | 18 | 160 | 12.5 | 32 | SCR0408 | TW15P |
| | EH-S20S STFP R/L 16 | 25 | 20 | 18 | 250 | 12.5 | 14 | | |
| TP□□1103□□ | EH-A10H STFP R/L 11 | 12 | 10 | 9.5 | 100 | 6 | - | SCR030508 | TW09P |
| | EH-A12K STFP R/L 11 | 16 | 12 | 11 | 125 | 8 | 10 | SCR0307 | TW09P |
| | EH-A16M STFP R/L 11 | 20 | 16 | 15 | 150 | 10 | 23 | | |
| TP□□1604□□ | EH-A20Q STFP R/L 16 | 25 | 20 | 19 | 180 | 12.5 | 41 | SCR0408 | TW15P |

STWP^{R/L}

Screw On

+ **TP** □ □

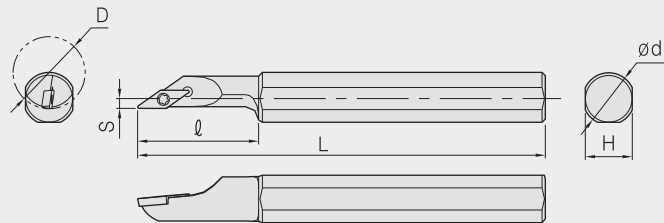


| Insert | Item No. | Dimensions (mm) | | | | | | Screw | Wrench |
|------------|---------------------|-----------------|----|----|-----|------|----|-----------|--------|
| | | øD | ød | H | L | S | l | | |
| TPGH1102□□ | EH-S10M STWP R/L 11 | 12 | 10 | 9 | 150 | 6 | 23 | SCR030508 | TW09P |
| TPGH1103□□ | EH-S12M STWP R/L 11 | 16 | 12 | 11 | 150 | 8 | 30 | SCR0306 | TW09P |
| | EH-S16R STWP R/L 11 | 20 | 16 | 15 | 180 | 10 | 35 | | |
| | EH-S20R STWP R/L 11 | 25 | 20 | 19 | 200 | 12.5 | 40 | | |

SVJC^{R/L}

Screw On

+ **VC** □ □

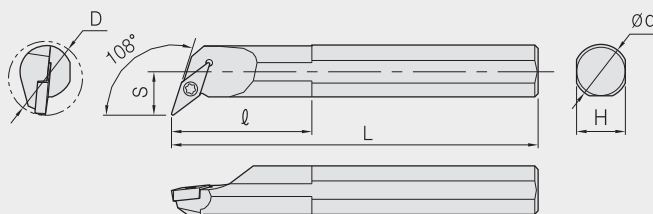


| Insert | Item No. | Dimensions (mm) | | | | | | Screw | Wrench |
|------------|---------------------|-----------------|----|----|-----|---|----|---------|--------|
| | | øD | ød | H | L | S | l | | |
| VCMT0802□□ | EH-S12M SVJC R/L 08 | 16 | 12 | 11 | 150 | 2 | 26 | SCR0204 | TW06P |
| | EH-S16Q SVJC R/L 08 | 20 | 16 | 15 | 180 | 2 | 36 | | |

SVQB^{R/L}

Screw On

+ **VB** □ □

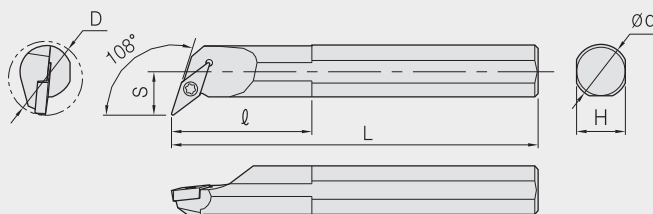


| Insert | Item No. | Dimensions (mm) | | | | | | Screw | Shim | Shim Screw | Wrench |
|------------|---------------------|-----------------|----|----|-----|----|----|----------|-------|------------|------------|
| | | ØD | Ød | H | L | S | l | | | | |
| VB□□1604□□ | EH-S32S SVQB R/L 16 | 40 | 32 | 30 | 250 | 22 | 56 | SCR03512 | SSV32 | SSCR0509 | TW15P,W35L |
| | EH-S40T SVQB R/L 16 | 50 | 40 | 37 | 300 | 27 | 64 | | | | |
| | EH-A32S SVQB R/L 16 | 40 | 32 | 31 | 250 | 22 | 56 | | | | |

SVQC^{R/L}

Screw On

+ **VC** □ □

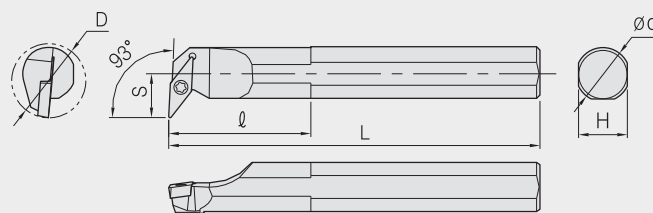


| Insert | Item No. | Dimensions (mm) | | | | | | Screw | Shim | Shim Screw | Wrench |
|------------|---------------------|-----------------|----|----|-----|----|----|----------|------|------------|--------|
| | | ØD | Ød | H | L | S | l | | | | |
| VC□□1103□□ | EH-S16R SVQC R/L 11 | 20 | 16 | 15 | 200 | 11 | 35 | SCR02565 | - | - | TW07P |
| | EH-S20S SVQC R/L 11 | 25 | 20 | 18 | 250 | 13 | 38 | | | | |
| | EH-S25R SVQC R/L 11 | 32 | 25 | 23 | 200 | 17 | 42 | | | | |
| VC□□1303□□ | EH-S20S SVQC R/L 13 | 25 | 20 | 18 | 250 | 13 | 42 | SCR0307 | - | - | TW07P |
| | EH-S25R SVQC R/L 13 | 32 | 25 | 23 | 200 | 17 | 45 | | | | |
| VC□□1604□□ | EH-S25R SVQC R/L 16 | 32 | 25 | 23 | 200 | 17 | 50 | SCR03510 | - | - | TW15P |
| | EH-S32S SVQC R/L 16 | 40 | 32 | 30 | 250 | 22 | 56 | | | | |
| | EH-S40T SVQC R/L 16 | 50 | 40 | 37 | 300 | 27 | 64 | | | | |

SVUB^{R/L}

Screw On

+ **VB** □ □

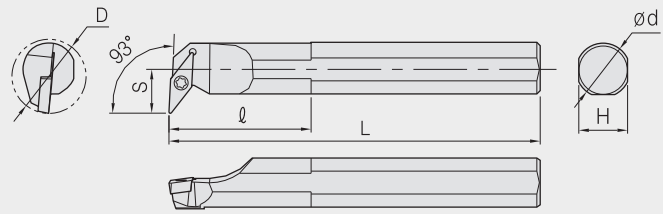


| Insert | Item No. | Dimensions (mm) | | | | | | Screw | Shim | Shim Screw | Wrench |
|------------|---------------------|-----------------|----|----|-----|----|----|----------|-------|------------|------------|
| | | ØD | Ød | H | L | S | l | | | | |
| VB□□1604□□ | EH-S32S SVUB R/L 16 | 40 | 32 | 30 | 250 | 22 | 56 | SCR03510 | SSV32 | SSCR0509 | TW15P,W35L |
| | EH-S40T SVUB R/L 16 | 50 | 40 | 37 | 300 | 27 | 64 | | | | |
| | EH-A32S SVUB R/L 16 | 40 | 32 | 31 | 250 | 22 | 56 | | | | |

SVUC^{R/L}

Screw On

+ **VC** □□

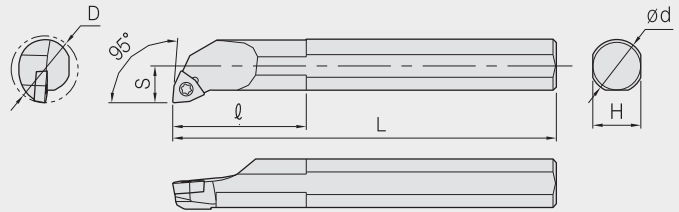


| Insert | Item No. | Dimensions (mm) | | | | | | Screw | Shim | Shim Screw | Wrench |
|--------------|---------------------|-----------------|----|----|-----|----|----|----------|-------|------------|--------|
| | | øD | ød | H | L | S | l | | | | |
| VC □□1103 □□ | EH-S16R SVUC R/L 11 | 22 | 16 | 15 | 200 | 13 | 30 | SCR02565 | - | - | TW07P |
| | EH-S20S SVUC R/L 11 | 25 | 20 | 18 | 250 | 14 | 33 | | | | |
| | EH-S25T SVUC R/L 11 | 32 | 25 | 23 | 300 | 17 | 38 | | | | |
| VC □□1303 □□ | EH-S20S SVUC R/L 13 | 28 | 20 | 18 | 250 | 16 | 35 | SCR0307 | - | - | TW09P |
| | EH-S25R SVUC R/L 13 | 32 | 25 | 23 | 200 | 17 | 40 | | | | |
| VC □□1604 □□ | EH-S25R SVUC R/L 16 | 32 | 25 | 23 | 200 | 19 | 50 | SCR03510 | - | - | TW15P |
| | EH-S32S SVUC R/L 16 | 40 | 32 | 30 | 250 | 22 | 56 | SCR03512 | SSV32 | SSCR0509 | TW15P |
| | EH-S40T SVUC R/L 16 | 50 | 40 | 37 | 300 | 27 | 64 | | | | W35L |

SWLC^{R/L}

Screw On

+ **WC** □□

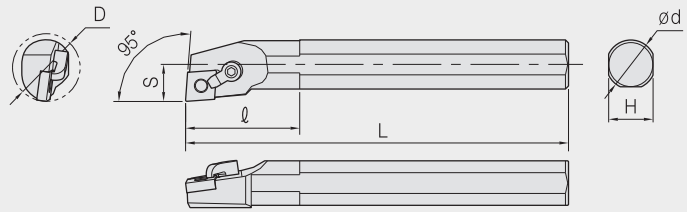


| Insert | Item No. | Dimensions (mm) | | | | | | Screw | Wrench |
|--------------|---------------------|-----------------|----|----|-----|----|----|----------|--------|
| | | øD | ød | H | L | S | l | | |
| WC □□0804 □□ | EH-S25R SWLC R/L 08 | 32 | 25 | 23 | 200 | 17 | 46 | SCR0411F | TW15P |
| | EH-S32S SWLC R/L 08 | 40 | 32 | 30 | 250 | 22 | 51 | | |
| WC □□0804 □□ | EH-A25R SWLC R/L 08 | 32 | 25 | 24 | 200 | 17 | 46 | SCR0411F | TW15P |
| | EH-A32S SWLC R/L 08 | 40 | 32 | 31 | 250 | 22 | 51 | | |

MCLN^{R/L}

Multi Locking

+ **CN**□□

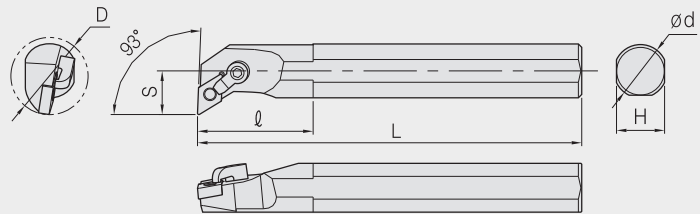


| Insert | Item No. | Dimensions (mm) | | | | | | Clamp | Clamp Screw | Shim | Shim Pin | Wrench |
|------------|---------------------|-----------------|----|----|-----|----|----|-------|---------------|-------|----------|--------|
| | | øD | ød | H | L | S | ℓ | | | | | |
| CN□□0903□□ | EH-S20S-MCLN R/L-09 | 25 | 20 | 18 | 250 | 13 | 30 | MCL7N | MCSCR10-32-19 | - | MSP3D3 | W19.8L |
| | EH-S25R-MCLN R/L-09 | 32 | 25 | 23 | 200 | 17 | 36 | | | | | W23.8L |
| CN□□1204□□ | EH-S25R-MCLN R/L-12 | 32 | 25 | 23 | 200 | 17 | 36 | MCL6N | MCSCR1/4-21 | MSC43 | MSP4D | W31.8L |
| | EH-S32S-MCLN R/L-12 | 40 | 32 | 30 | 250 | 22 | 50 | | | | | W23.8L |
| | EH-S40T-MCLN R/L-12 | 50 | 40 | 37 | 300 | 27 | 60 | | | | | |
| CN□□1204□□ | EH-A25R-MCLN R/L-12 | 32 | 25 | 23 | 200 | 17 | 40 | MCL6N | MCSCR1/4-21 | - | MSP4DS | W31.8L |
| | EH-A32S-MCLN R/L-12 | 40 | 32 | 30 | 250 | 22 | 50 | | | | | MSC43 |

MDUN^{R/L}

Multi Locking

+ **DN**□□

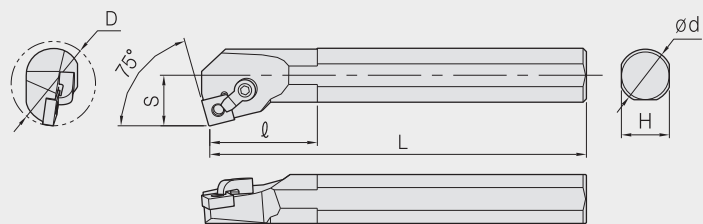


| Insert | Item No. | Dimensions (mm) | | | | | | Clamp | Clamp Screw | Shim | Shim Pin | Wrench |
|------------|-----------------------|-----------------|----|----|-----|----|----|-------|-------------|-------|----------|--------|
| | | øD | ød | H | L | S | ℓ | | | | | |
| DN□□1504□□ | EH-S32S-MDUN R/L-15-3 | 40 | 32 | 30 | 250 | 22 | 50 | MCL6N | MCSCR1/4-21 | MSD43 | MSP4D | W31.8L |
| | EH-S40T-MDUN R/L-15-3 | 50 | 40 | 37 | 300 | 27 | 60 | | | | | W23.8L |
| | EH-A32S-MDUN R/L-15-3 | 40 | 32 | 30 | 250 | 22 | 50 | | | | | |

MSKN^{R/L}

Multi Locking

+ **SN**□□



| Insert | Item No. | Dimensions (mm) | | | | | | Clamp | Clamp Screw | Shim | Shim Pin | Wrench |
|------------|---------------------|-----------------|----|----|-----|----|----|--------|--------------|-------|----------|--------|
| | | øD | ød | H | L | S | ℓ | | | | | |
| SN□□1204□□ | EH-S25R-MSKN R/L-12 | 32 | 25 | 23 | 200 | 17 | 36 | MCL8N1 | MCSCR5/16-28 | MSS43 | MSP4D | W39.7L |
| | EH-S32S-MSKN R/L-12 | 40 | 32 | 30 | 250 | 22 | 50 | | | | | W23.8L |
| | EH-S40T-MSKN R/L-12 | 50 | 40 | 37 | 300 | 27 | 60 | | | | | |
| SN□□1204□□ | EH-A25R-MSKN R/L-12 | 32 | 25 | 23 | 200 | 17 | 40 | MCL8N1 | MCSCR5/16-28 | - | MSP4DS | W39.7L |
| | EH-A32S-MSKN R/L-12 | 40 | 32 | 30 | 250 | 22 | 50 | | | | | W23.8L |
| | EH-A40T-MSKN R/L-12 | 50 | 40 | 37 | 300 | 27 | 60 | | | | | MSS43 |



**Grooving
Parting**

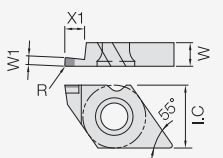
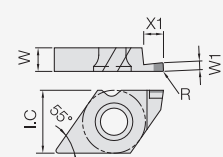
Grooving/Parting



The line of grooving and cutting enables high speed machining while maintaining longer tool life. Also, it provides consistent products, simplified quality control, and lower cost.



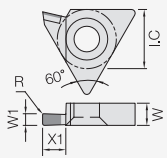
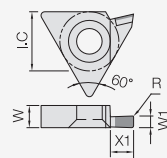
GDNX Type (PCD/ PCBN)

| Shape | Item No. | Dimensions (mm) | | | | | PCD | | | PCBN | | | |
|---|-------------|-----------------|-----|-----|------|------|------|------|-------|-------|-------|-------|------|
| | | W1 | X1 | R | W | I.C | EP20 | EP65 | EP750 | EB28X | EB570 | EB550 | EB51 |
|  | GDNX 1502-R | 1.5 | 2.6 | 0.2 | 4.76 | 12.7 | | | | | | | |
| | 2002-R | 2 | 3 | 0.2 | 4.76 | 12.7 | | | | | | | |
| | 3002-R | 3 | 4.5 | 0.2 | 4.76 | 12.7 | | | | | | | |
| | 4002-R | 4 | 4.5 | 0.2 | 4.76 | 12.7 | | | | | | | |
|  | GDNX 1502-L | 1.5 | 2.6 | 0.2 | 4.76 | 12.7 | | | | | | | |
| | 2002-L | 2 | 3 | 0.2 | 4.76 | 12.7 | | | | | | | |
| | 3002-L | 3 | 4.5 | 0.2 | 4.76 | 12.7 | | | | | | | |
| | 4002-L | 4 | 4.5 | 0.2 | 4.76 | 12.7 | | | | | | | |

Special order (possible to choose W1, X1, R, PCD, PCBN material)

Holder : 99p

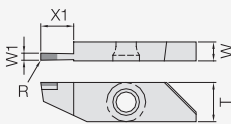
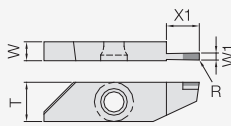
GTNX Type (PCD/ PCBN)

| Shape | Item No. | Dimensions (mm) | | | | | PCD | | | PCBN | | | |
|---|-------------|-----------------|-----|-----|------|------|------|------|-------|-------|-------|-------|------|
| | | W1 | X1 | R | W | I.C | EP20 | EP65 | EP750 | EB28X | EB570 | EB550 | EB51 |
|  | GTNX 1502-R | 1.5 | 3 | 0.2 | 4.76 | 12.7 | | | | | | | |
| | 2002-R | 2 | 3.5 | 0.2 | 4.76 | 12.7 | | | | | | | |
| | 3002-R | 3 | 4.5 | 0.2 | 4.76 | 12.7 | | | | | | | |
| | 4002-R | 4 | 4.5 | 0.2 | 4.76 | 12.7 | | | | | | | |
|  | GTNX 1502-L | 1.5 | 3 | 0.2 | 4.76 | 12.7 | | | | | | | |
| | 2002-L | 2 | 3.5 | 0.2 | 4.76 | 12.7 | | | | | | | |
| | 3002-L | 3 | 4.5 | 0.2 | 4.76 | 12.7 | | | | | | | |
| | 4002-L | 4 | 4.5 | 0.2 | 4.76 | 12.7 | | | | | | | |

Special order (possible to choose W1, X1, R, PCD, PCBN material)

Holder : 99p

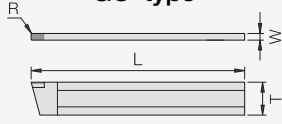


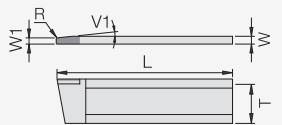
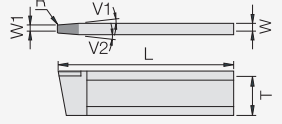
GMX Type (PCD/ PCBN)

| Shape | Item No. | Dimensions (mm) | | | | | | PCD | | | PCBN | | |
|---|-------------|-----------------|-----|------|-----|------|-----|------|------|-------|-------|------|------|
| | | W1 | X1 | R | W | L | T | EP20 | EP65 | EP750 | EB570 | EB22 | EB51 |
|  | GMX 05000-R | 0.5 | 3.0 | 0.00 | 2.7 | 22.2 | 5.6 | | | | | | |
| | 10005-R | 1.0 | 3.5 | 0.00 | 2.7 | 22.2 | 5.6 | | | | | | |
| | 15005-R | 1.5 | 3.5 | 0.05 | 2.7 | 22.2 | 5.6 | | | | | | |
| | 2001-R | 2.0 | 4.0 | 0.10 | 2.7 | 22.2 | 5.6 | | | | | | |
| | 2501-R | 2.5 | 4.0 | 0.10 | 2.7 | 22.2 | 5.6 | | | | | | |
|  | GMX 05000-L | 0.5 | 3.0 | 0.00 | 2.7 | 22.2 | 5.6 | | | | | | |
| | 10005-L | 1.0 | 3.5 | 0.00 | 2.7 | 22.2 | 5.6 | | | | | | |
| | 15005-L | 1.5 | 3.5 | 0.05 | 2.7 | 22.2 | 5.6 | | | | | | |
| | 2001-L | 2.0 | 4.0 | 0.10 | 2.7 | 22.2 | 5.6 | | | | | | |
| | 2501-L | 2.5 | 4.0 | 0.10 | 2.7 | 22.2 | 5.6 | | | | | | |

Special order (possible to choose W1, X1, R, PCD, PCBN material)

Holder : 99p

Piston Ring (PCD/PCBN)

| Shape | Item No. | Dimensions (mm) | | | | | | PCD | | | PCBN | | |
|--|----------|-----------------|---|---|---|----|----|------|-------|------|------|-------|--|
| | | W | T | L | R | V1 | V2 | EP13 | EP750 | EP59 | EB51 | EB710 | |
| GC type  | | | | | | | | | | | | | |
| GR type  | | | | | | | | | | | | | |
| GL type  | | | | | | | | | | | | | |
| 1Side Taper type  | | | | | | | | | | | | | |
| 2Side Taper type  | | | | | | | | | | | | | |

Please specify the workpiece, W, W1, R, L, T and V.

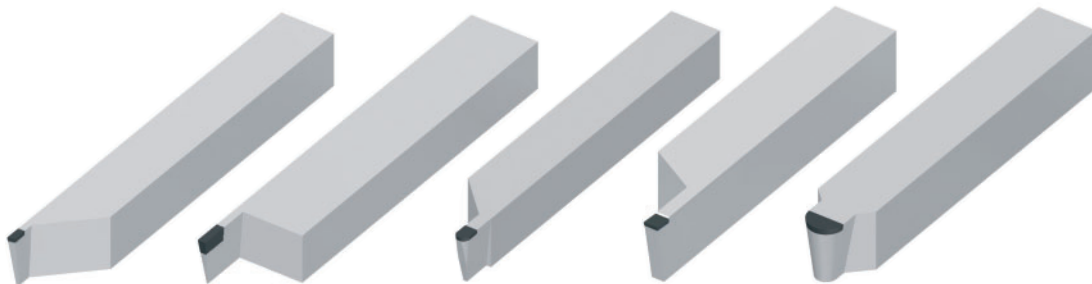
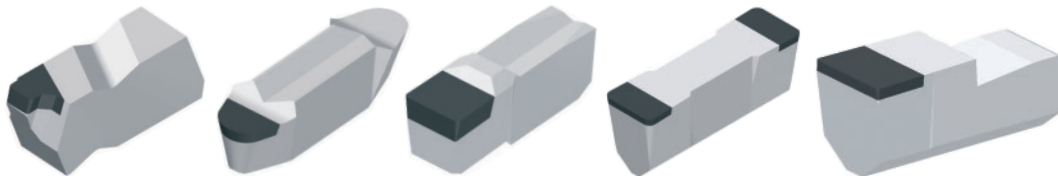
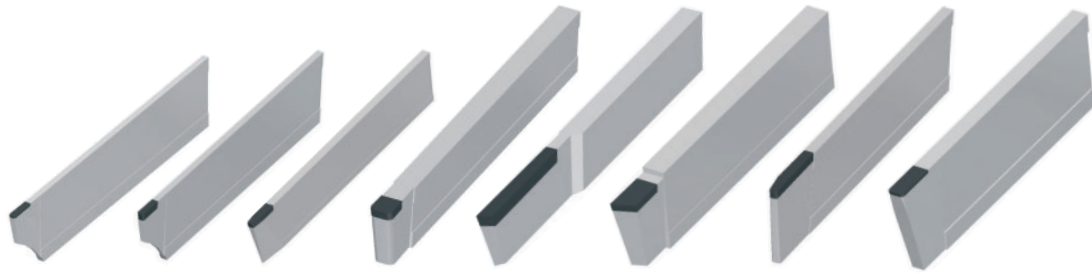
Others

| Shape | Dimensions (mm) | | | | | | PCD | | | PCBN | | | | |
|-------|-----------------|----|---|----|---|---|------|------|-------|-------|-------|-------|------|--|
| | W | W1 | R | X1 | L | T | EP20 | EP65 | EP750 | EB28X | EB570 | EB550 | EB51 | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
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Please specify the workpiece, W, W1, R, X1, L and T.

Order made _ shape sample

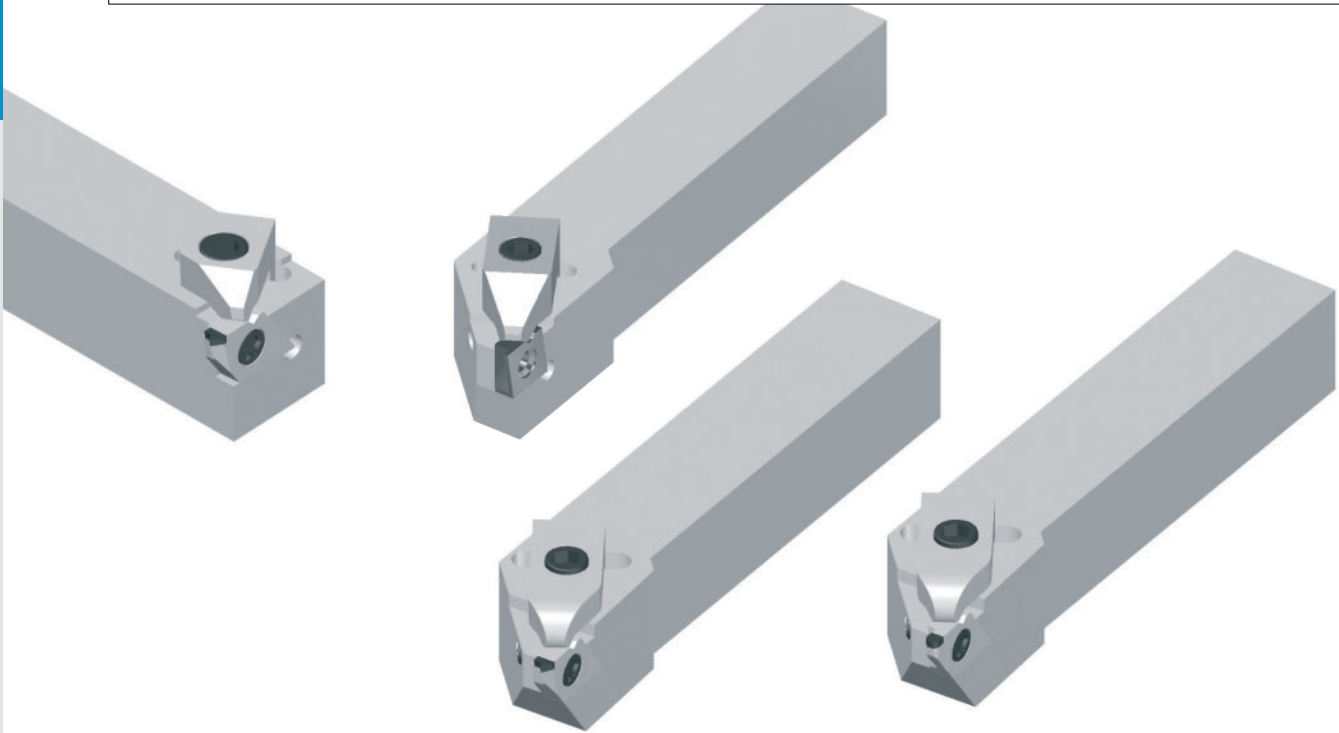
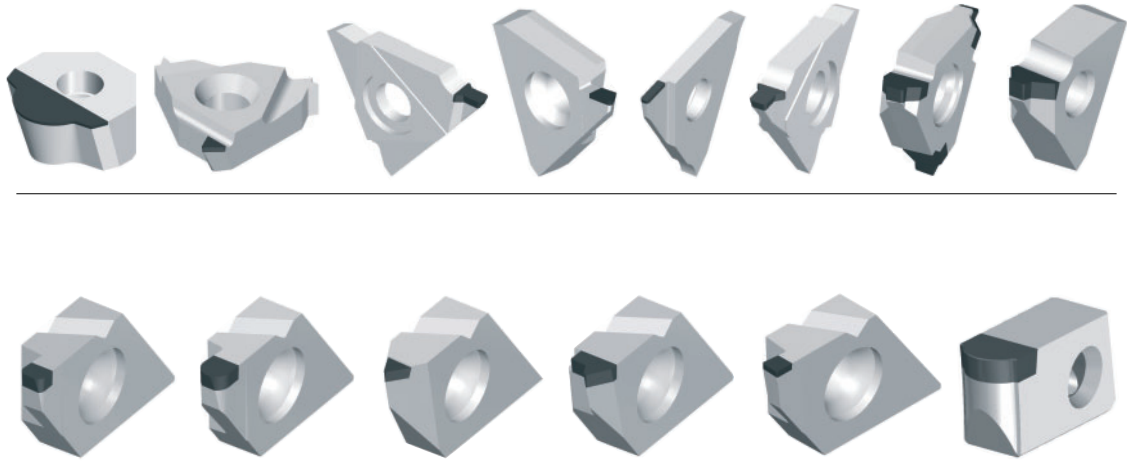
- Face, Slot, Chamfer, Profile, Etc.
- Customers get optimized tooling service depending on their demand.



Grooving/Parting

Order made _ shape sample

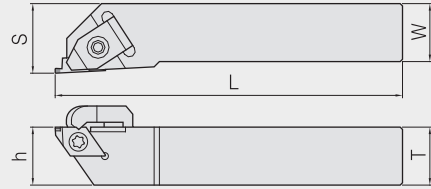
- Face, Slot, Chamfer, Profile, Etc.
- Customers get optimized tooling service depending on their demand.







GDNX^{R/L}

Double Clamping

+ GDNX □□

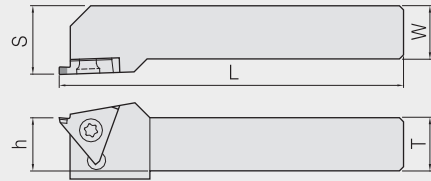




| Insert | Item No. | Dimensions (mm) | | | | | Clamp | Clamp Screw | Screw | Wrench |
|---------|------------------|-----------------|----|-----|----|----|--|---|---|---|
| | | T | W | L | S | h |  |  |  |  |
| GDNX □□ | EH-GDNX R/L 2525 | 25 | 25 | 130 | 30 | 25 | DCG4 | MHA0512 | PTKA0512 | TW20L |

GTNX^{R/L}

Screw On

+ GTNX □□

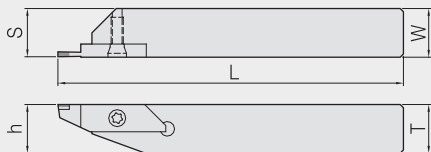




| Insert | Item No. | Dimensions (mm) | | | | | Screw | Wrench |
|---------|------------------|-----------------|----|-----|----|----|---|---|
| | | T | W | L | S | h |  |  |
| GTNX □□ | EH-GTNX R/L 2525 | 25 | 25 | 130 | 30 | 25 | FTNA0511 | TW20L |

GMX^{R/L}

Screw On

+ GMX □□



| Insert | Item No. | Dimensions (mm) | | | | | Screw | Wrench |
|--------|-----------------|-----------------|----|-----|----|----|---|---|
| | | T | W | L | S | h |  |  |
| GMX □□ | EH-GMX R/L 1010 | 10 | 10 | 100 | 10 | 10 | FTKA02565 | TW208P |

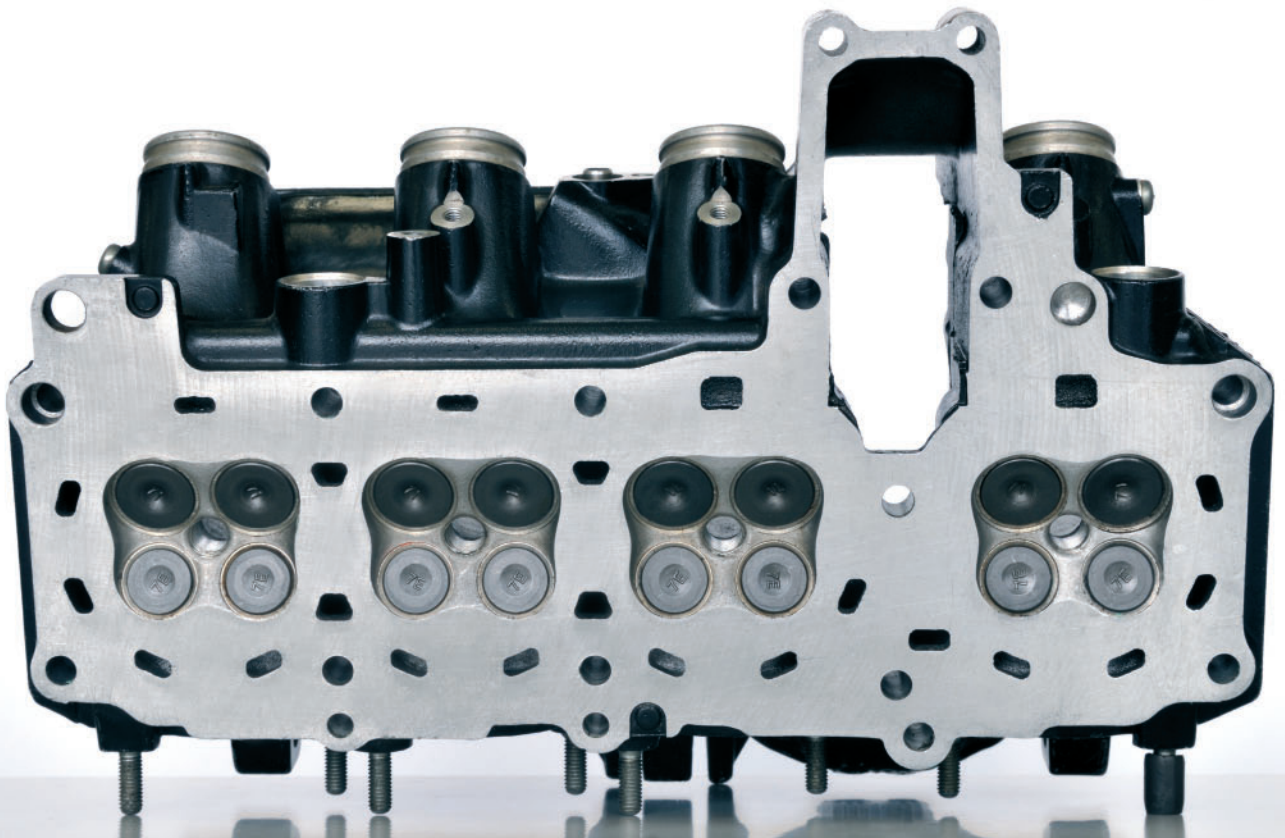


Milling



We are dedicated to designing and developing special milling and indexable inserts for machining the work-pieces ranged from easy-to-machine to difficult-to-machine

- _ Strong insert and tool design to maximize productivity
- _ Available in various grades such as ultra-fine, fine, medium, coarse and modal to machine all material types
- _ Guarantee increased tool life and enhanced wear resistance
- _ Economical, consistent, and reliable performance
- _ Re-sharpening & Re-tipping help the tools extend their tool life and reduce the tool cost



Designation system

S

P

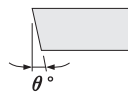
K

N

Insert shape

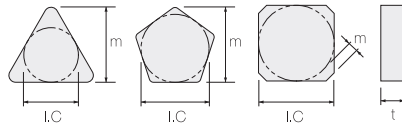
| Symbol | Shape |
|--------|---------|
| A | |
| B | |
| C | |
| H | |
| L | |
| O | |
| P | |
| R | |
| S | |
| T | |
| W | |
| X | Special |

Clearance angle



| Symbol | Angle |
|--------|-------|
| N | 0° |
| A | 3° |
| B | 5° |
| C | 7° |
| P | 11° |
| D | 15° |
| E | 20° |
| F | 25° |
| G | 30° |

Tolerances



| Class | I.C size (mm) | Tolerance | | |
|-------|---------------|-----------|--------|----------|
| | | m (mm) | t (mm) | I.C (mm) |
| A | 6.35 | ±0.005 | ±0.025 | ±0.025 |
| E | 9.525 | ±0.025 | ±0.025 | ±0.025 |
| F | 12.7 | ±0.005 | ±0.025 | ±0.013 |
| G | 15.875 | ±0.025 | ±0.13 | ±0.025 |
| H | 25.4 | ±0.013 | ±0.025 | ±0.013 |
| K | 6.35 | ±0.013 | ±0.025 | ±0.05 |
| | 9.525 | ±0.013 | ±0.025 | ±0.05 |
| | 12.7 | ±0.013 | ±0.025 | ±0.08 |
| | 15.875 | ±0.013 | ±0.025 | ±0.1 |
| | 19.05 | ±0.013 | ±0.025 | ±0.1 |
| M | 25.4 | ±0.013 | ±0.025 | ±0.13 |
| | 6.35 | ±0.08 | ±0.13 | ±0.05 |
| | 9.525 | ±0.08 | ±0.13 | ±0.05 |
| | 12.7 | ±0.13 | ±0.13 | ±0.08 |
| | 15.875 | ±0.15 | ±0.13 | ±0.1 |
| | 19.05 | ±0.15 | ±0.13 | ±0.1 |
| | 25.4 | ±0.18 | ±0.13 | ±0.13 |

Clamp type

| Symbol | Shape |
|--------|---------|
| A | |
| F | |
| G | |
| M | |
| N | |
| R | |
| T | |
| W | |
| X | Special |

12 03 08 ED T (R)

Cutting edge length Thickness Corner radius Parallel land

| | | | | | I.C size (mm) | |
|----|----|----|----|--|---------------|-------|
| 09 | | | | | 5.56 | |
| 06 | 06 | 11 | | | 6.35 | |
| 08 | 13 | | | | 7.94 | |
| 09 | 09 | 16 | | | 9.525 | |
| 12 | 12 | 22 | 05 | | 12.7 | |
| 16 | 15 | 27 | 09 | | 15.875 | |
| | | | | | 07 | 17.94 |
| 19 | 19 | 33 | 10 | | 19.05 | |
| 25 | 25 | | | | 25.4 | |

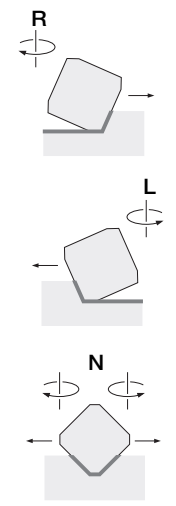
| Symbol | t (mm) |
|--------|--------|
| 01 | 1.59 |
| 02 | 2.38 |
| 03 | 3.18 |
| T3 | 3.97 |
| 04 | 4.76 |
| 05 | 5.56 |
| 06 | 6.35 |
| 07 | 7.94 |
| 09 | 9.52 |

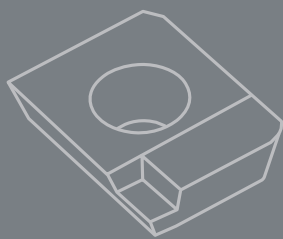
| Symbol | R (mm) |
|--------|--------|
| 00 | Sharp |
| 02 | 0.2 |
| 04 | 0.4 |
| 05 | 0.5 |
| 08 | 0.8 |
| 10 | 1.0 |
| 12 | 1.2 |
| 15 | 1.5 |
| 16 | 1.6 |
| 24 | 2.4 |
| 32 | 3.2 |
| 40 | 4.0 |

| Entering angle | | Clearance angle of land | |
|----------------|---------|-------------------------|---------|
| A | 45° | B | 5° |
| D | 60° | C | 7° |
| E | 75° | D | 15° |
| F | 85° | E | 20° |
| P | 90° | F | 25° |
| Z | Special | G | 30° |
| | | N | 0° |
| | | P | 11° |
| | | Z | Special |

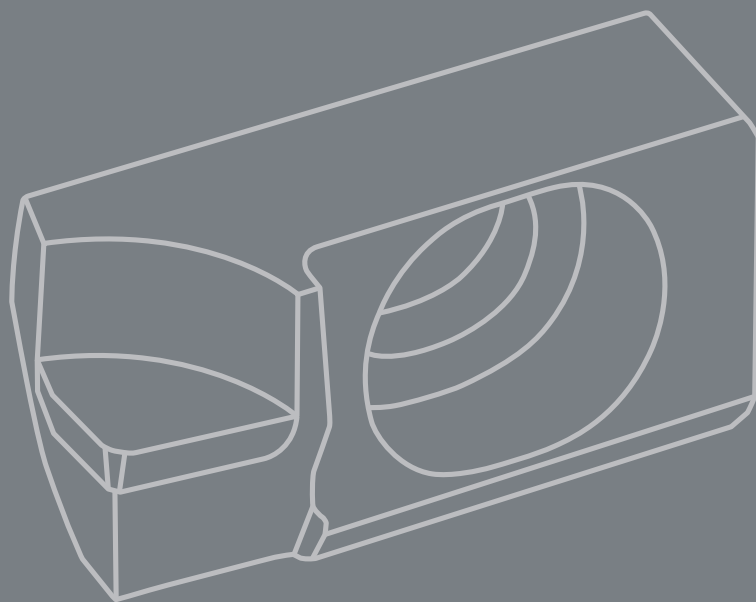
1 Edge shape 2 Cutting direction

| Symbol | Shape |
|--------|-------|
| F | |
| E | |
| T | |
| S | |

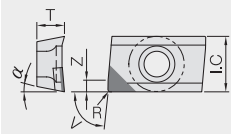




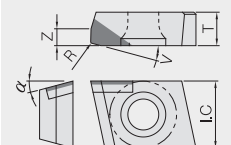
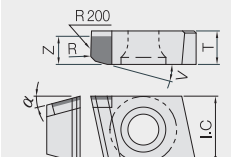
Milling_
PCD



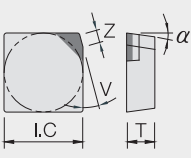
APKT

| Shape | ISO code | | Dimensions (mm) | | | | | | PCD | | | | |
|---|---------------|------|-----------------|---|----------|---|---|------|------|------|-------|------|------|
| | Metric | Inch | I.C | Z | α | V | R | T | EP20 | EP55 | EP750 | EP58 | EP29 |
|  | APKT 1604PDFR | | 9.525 | 2 | 11 | | | 4.76 | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

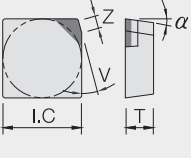
CDEW

| Shape | ISO code | | Dimensions (mm) | | | | | | PCD | | | | |
|---|--------------|------|-----------------|-----|----------|----|-----|------|------|------|-------|------|------|
| | Metric | Inch | I.C | Z | α | V | R | T | EP20 | EP55 | EP750 | EP58 | EP29 |
|  | CDEW 1204R-R | | 12.7 | 2.4 | 15 | 15 | - | 4.76 | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
|  | CDEW 1204R-F | | 12.7 | 4.5 | 15 | 15 | 200 | 4.76 | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

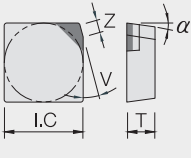
SPGN

| Shape | ISO code | | Dimensions (mm) | | | | | | PCD | | | | |
|---|---------------------|-------------------|-----------------|-----|----------|----|---|------|------|------|-------|------|------|
| | Metric | Inch | I.C | Z | α | V | R | T | EP20 | EP55 | EP750 | EP58 | EP29 |
|  | SPGN 1203EDR | SPGN 42EDR | 12.7 | 1.4 | 11 | 15 | | 3.18 | | | | | |
| | 1203EDL | 42EDL | 12.7 | 1.4 | 11 | 15 | | 3.18 | | | | | |
| | 1504EDR | 53EDR | 15.88 | 1.4 | 11 | 15 | | 3.18 | | | | | |

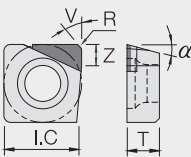
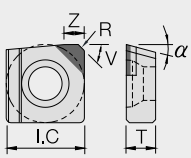
SEGN

| Shape | ISO code | | Dimensions (mm) | | | | | | PCD | | | | |
|--|---------------------|-------------------|-----------------|---|----------|----|---|------|------|------|-------|------|------|
| | Metric | Inch | I.C | Z | α | V | R | T | EP20 | EP55 | EP750 | EP58 | EP29 |
|  | SEGN 1203AFN | SEGN 42AFN | 12.7 | 2 | 20 | 45 | | 3.18 | | | | | |
| | 1203EFR | 42EFR | 12.7 | 2 | 20 | 15 | | 3.18 | | | | | |
| | 1504AFN | 53AFN | 15.88 | 2 | 20 | 45 | | 4.76 | | | | | |
| | 1504EFR | 53EFR | 15.88 | 2 | 20 | 15 | | 4.76 | | | | | |

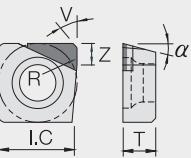
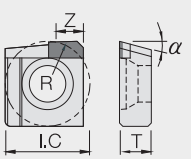
SFGN

| Shape | ISO code | | Dimensions (mm) | | | | | | PCD | | | | |
|---|---------------------|-------------------|-----------------|---|----------|----|---|------|------|------|-------|------|------|
| | Metric | Inch | I.C | Z | α | V | R | T | EP20 | EP55 | EP750 | EP58 | EP29 |
|  | SFGN 1203EFR | SFGN 42EFR | 12.7 | 2 | 25 | 15 | | 3.18 | | | | | |
| | | | | | | | | | | | | | |

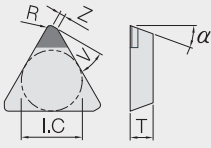
SNEW

| Shape | ISO code | | Dimensions (mm) | | | | | | PCD | | | | |
|---|------------------|------|-----------------|------|----------|----|-----|------|------|------|-------|------|------|
| | Metric | Inch | I.C | Z | α | V | R | T | EP20 | EP55 | EP750 | EP58 | EP29 |
|  | NF-SNEW 09T3ADTR | | 9.525 | 2.35 | 15 | 45 | | 3.97 | | | | | |
| | 09T3ADTR-R | | 9.525 | 2.35 | 15 | | 0.5 | 3.97 | | | | | |
|  | NF-SNEW 1204AFTR | | 12.7 | 3.3 | 15 | 45 | | 4.76 | | | | | |
| | 1204AFTR-R | | 12.7 | 3.3 | 15 | | 1 | 4.76 | | | | | |

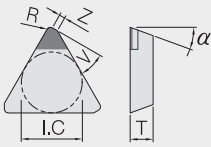
SNEW(W)

| Shape | ISO code | | Dimensions (mm) | | | | | | PCD | | | | |
|---|--------------------|------|-----------------|-----|----------|----|-----|------|------|------|-------|------|------|
| | Metric | Inch | I.C | Z | α | V | R | T | EP20 | EP55 | EP750 | EP58 | EP29 |
|  | NF-SNEW 09T3ADTR-W | | 9.525 | 2.6 | 15 | 45 | 100 | 3.97 | | | | | |
|  | NF-SNEW 1204ADFR-W | | 12.7 | 5 | 15 | 45 | 300 | 4.76 | | | | | |

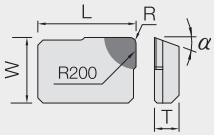
TPGN

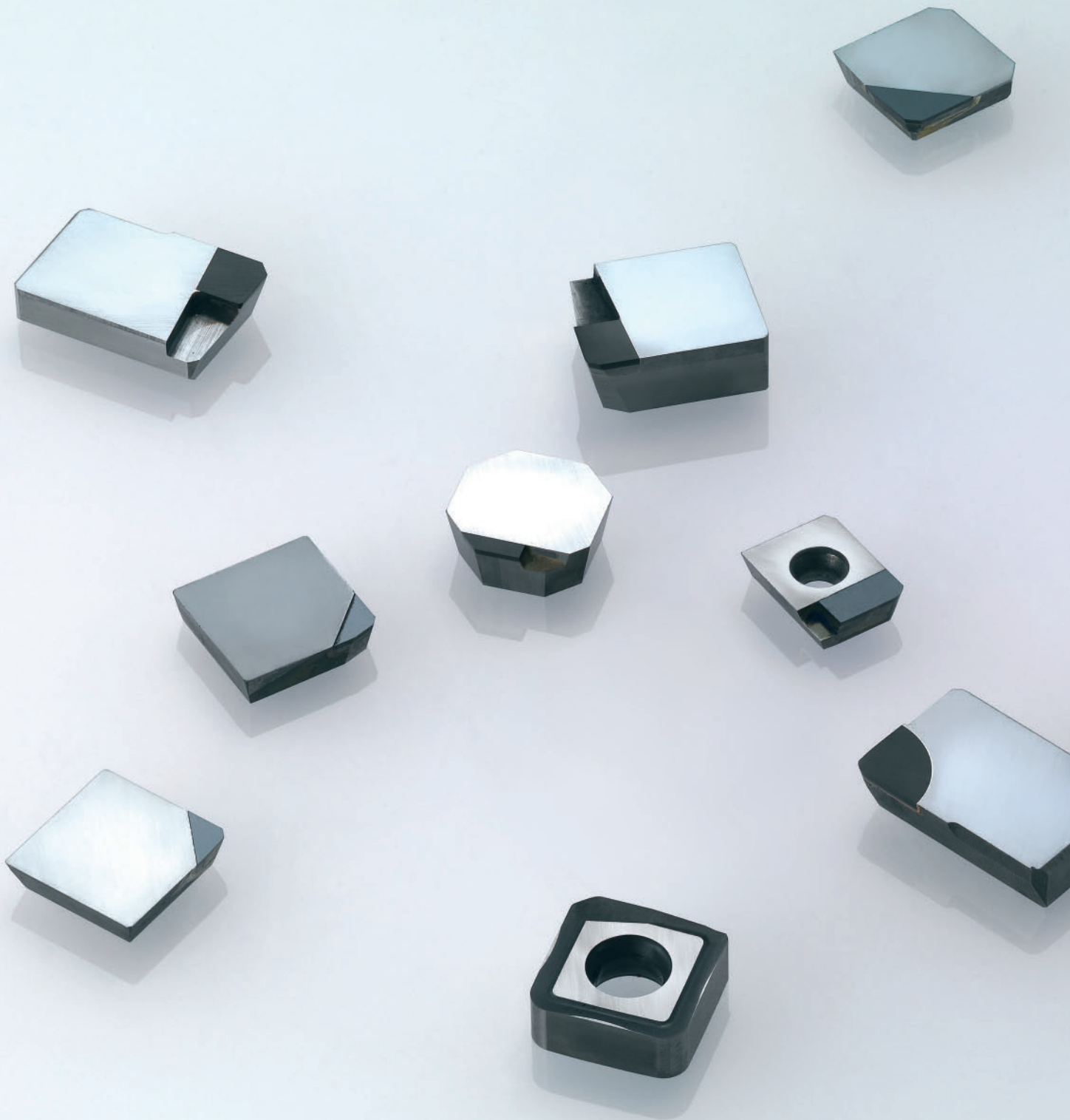
| Shape | ISO code | | Dimensions (mm) | | | | | | PCD | | | | |
|---|---------------------|-------------------|-----------------|-----|----------|----|---|------|------|------|-------|------|------|
| | Metric | Inch | I.C | Z | α | V | R | T | EP20 | EP55 | EP750 | EP58 | EP29 |
|  | TPGN 1603PDR | TPGN 32PDR | 12.7 | 1.2 | 11 | 30 | | 3.18 | | | | | |
| | 1603PDL | 32PDL | 12.7 | 1.2 | 11 | 30 | | 3.18 | | | | | |
| | 2204PDR | 43PDR | 15.88 | 1.4 | 11 | 30 | | 4.76 | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

TEGN

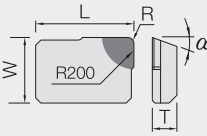
| Shape | ISO code | | Dimensions (mm) | | | | | | PCD | | | | |
|--|---------------------|-------------------|-----------------|-----|----------|----|-----|------|------|------|-------|------|------|
| | Metric | Inch | I.C | Z | α | V | R | T | EP20 | EP55 | EP750 | EP58 | EP29 |
|  | TEGN 1603PER | TEGN 32PER | 12.7 | 1.2 | 20 | 30 | 0.8 | 3.18 | | | | | |
| | 2204PER | 43PER | 15.88 | 1.4 | 20 | 30 | 0.8 | 4.76 | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

LDCN

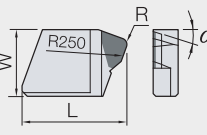
| Shape | ISO code | | Dimensions (mm) | | | | | | PCD | | | | |
|---|---------------------|-------------|-----------------|---|----------|-------|-----|------|------|------|-------|------|------|
| | Metric | Inch | I.C | Z | α | L | R | T | EP20 | EP55 | EP750 | EP58 | EP29 |
|  | LDCN 190412R | LDCN | 12.7 | | 15 | 19.05 | 1.2 | 4.76 | | | | | |
| | 190412L | | 12.7 | | 15 | 19.05 | 1.2 | 4.76 | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |



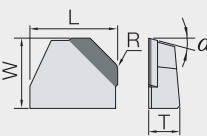
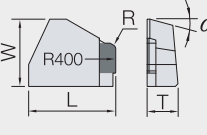
LFCN

| Shape | ISO code | | Dimensions (mm) | | | | | | PCD | | | | |
|---|--------------|------|-----------------|---|----------|-------|-----|------|------|------|-------|------|------|
| | Metric | Inch | I.C | Z | α | L | R | T | EP20 | EP55 | EP750 | EP58 | EP29 |
|  | LFCN 190412R | LFCN | 12.7 | | 25 | 19.05 | 1.2 | 4.76 | | | | | |
| | 190412L | | 12.7 | | 25 | 19.05 | 1.2 | 4.76 | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

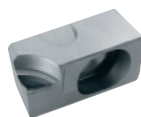
GDCN

| Shape | ISO code | | Dimensions (mm) | | | | | | PCD | | | | |
|--|---------------|------|-----------------|---|----------|----|-----|------|------|------|-------|------|------|
| | Metric | Inch | I.C | Z | α | L | R | T | EP20 | EP55 | EP750 | EP58 | EP29 |
|  | GDCN 2004PDFR | GDCN | 12.7 | | 15 | 20 | 1.2 | 4.76 | | | | | |
| | 2004PDFL | | 12.7 | | 15 | 20 | 1.2 | 4.76 | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

YDEN

| Shape | ISO code | | Dimensions (mm) | | | | | | PCD | | | | |
|---|------------------|------|-----------------|---|----------|--------|-----|-------|------|------|-------|------|------|
| | Metric | Inch | I.C | Z | α | V | R | T | EP20 | EP55 | EP750 | EP58 | EP29 |
|  | YDEN 1505ADFR | | 12.7 | | 15 | 15.875 | 1.6 | 5.675 | | | | | |
| | | | | | | | | | | | | | |
|  | YDEN 1505ADFR-WD | | 12.28 | | 15 | 15.925 | 0.8 | 5.675 | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

Cartridge_ SD type



| SDR | Item No. | Dimensions (mm) | | | | | | PCD | | | | | |
|-----|--------------------|-----------------|----|----------|----|-----|----|------|------|-------|------|------|--|
| | | W | V | α | L | R | T | EP20 | EP55 | EP750 | EP58 | EP29 | |
| | SDR | 13.5 | 15 | 11 | 30 | | 12 | | | | | | |
| | SDR-A | 13.5 | 0 | 11 | 30 | | 12 | | | | | | |
| | SDR-R | 13.5 | 15 | 11 | 30 | 0.4 | 12 | | | | | | |
| | SDR-ES (EDGE HONE) | 13.5 | 15 | 11 | 30 | | 12 | | | | | | |
| | | | | | | | | | | | | | |
| SDW | Item No. | Dimensions (mm) | | | | | | PCD | | | | | |
| | | W | Z | α | L | R | T | EP20 | EP55 | EP750 | EP58 | EP29 | |
| | SDW | 13 | | 11 | 30 | 400 | 12 | | | | | | |
| | SDW-ES (EDGE HONE) | 13 | | 11 | 30 | 400 | 12 | | | | | | |
| | | | | | | | | | | | | | |

Cartridge_ High feed type

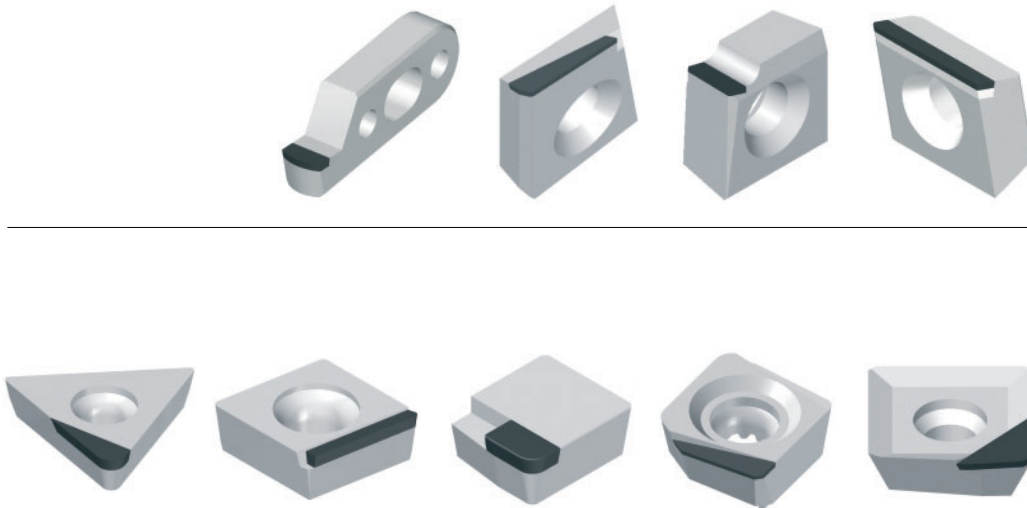


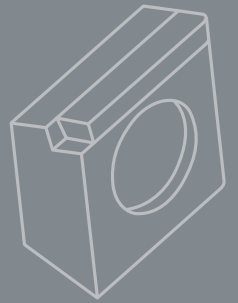
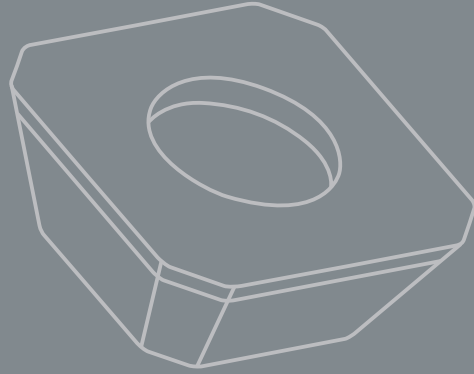
| HFR | Item No. | Dimensions (mm) | | | | | | PCD | | | | | |
|-----|----------|-----------------|----|----------|----|-----|----|------|------|-------|------|------|--|
| | | W | Z | α | L | R | T | EP20 | EP55 | EP750 | EP58 | EP29 | |
| | HFR | 10 | 15 | 11 | 25 | | 11 | | | | | | |
| | HFR-A | 10 | 0 | 11 | 25 | | 11 | | | | | | |
| | HFR-R | 10 | 15 | 11 | 25 | 0.4 | 11 | | | | | | |
| | HFR-ES | 10 | 15 | 11 | 25 | | 11 | | | | | | |
| | | | | | | | | | | | | | |
| HFW | Item No. | Dimensions (mm) | | | | | | PCD | | | | | |
| | | W | Z | α | L | R | T | EP20 | EP55 | EP750 | EP58 | EP29 | |
| | HFW | 9.8 | | | 25 | 400 | 11 | | | | | | |
| | HFW-ES | 9.8 | | | 25 | 400 | 11 | | | | | | |
| | | | | | | | | | | | | | |

- SDR** : STANDARD FACE MILLING ROUGH
- SDR-A** : CORNER MILLING ROUGH
- SDR-R** : STANDARD FACE MILLING ROUGH WITH NOSE RADIUS
- SDR-ES** : ROUGH WITH EDGE HONE
- SDW** : STANDARD FACE MILLING WIPER
- SDW-ES** : WIPER WITH EDGE HONE

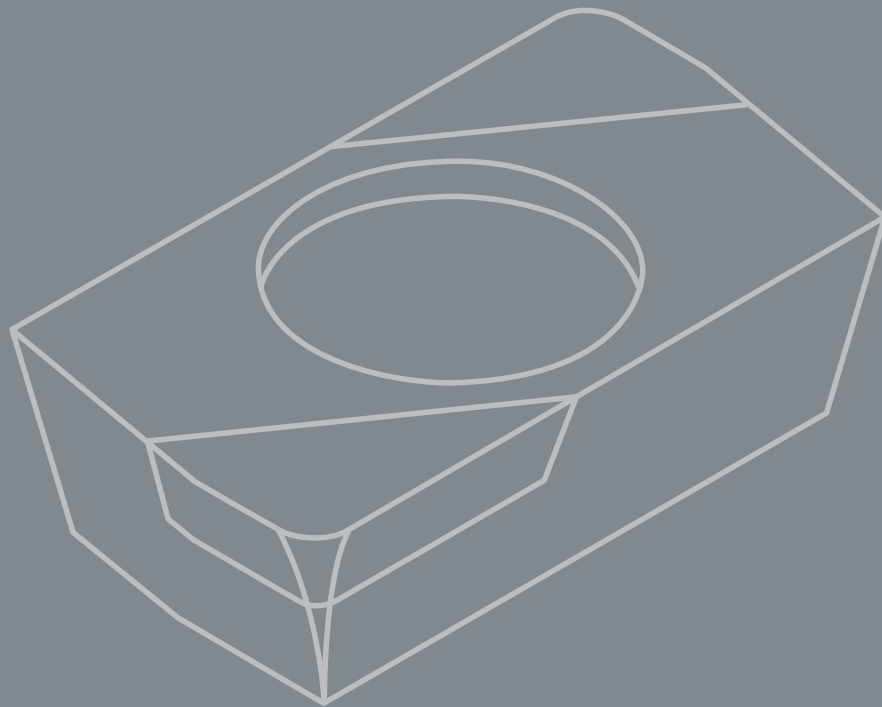
Order made _ shape sample

- Face, Slot, Chamfer, Profile, Etc.
- Customers can get optimized tooling service depending on their demand.

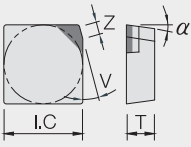




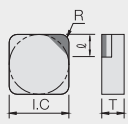
Milling_
PCBN



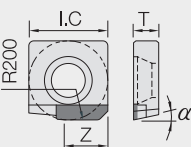
SPGN

| Shape | ISO code | | Dimensions (mm) | | | | | | PCBN | | | | |
|---|---------------------|-------------------|-----------------|-----|----------|----|---|------|------|-------|------|------|-------|
| | Metric | Inch | I.C | Z | α | V | R | T | EB11 | EB210 | EB51 | EB71 | EB710 |
|  | SPGN 1203EDR | SPGN 42EDR | 12.7 | 1.4 | 11 | 15 | | 3.18 | | | | | |
| | 1203EDL | 42EDL | 12.7 | 1.4 | 11 | 15 | | 3.18 | | | | | |
| | 1504EDR | 53EDR | 15.9 | 1.4 | 11 | 15 | | 3.18 | | | | | |

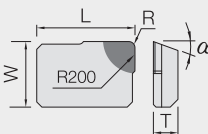
SNGN

| Shape | ISO code | | Dimensions (mm) | | | | | | | PCBN | | | | |
|--|----------------------|--------------------|-----------------|---|----------|----|-----|------|------|------|-------|------|------|-------|
| | Metric | Inch | W | Z | α | V | R | T | L | EB11 | EB210 | EB51 | EB71 | EB710 |
|  | SNGN 1506APTR | SNGN 54APTR | 12.7 | 5 | 11 | 45 | 250 | 6.35 | 15.9 | | | | | |
| | 1506APTL | 54APTL | 12.7 | 5 | 11 | 45 | 250 | 6.35 | 15.9 | | | | | |

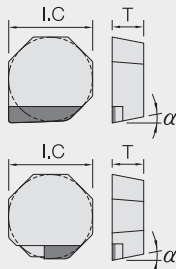
SNEW

| Shape | ISO code | | Dimensions (mm) | | | | | | PCBN | | | | |
|---|----------------------|------------------------|-----------------|-----|----------|----|-----|------|------|-------|------|------|-------|
| | Metric | Inch | I.C | Z | α | V | R | T | EB11 | EB210 | EB51 | EB71 | EB710 |
|  | SNEW 09T3ADFR | SNEW 3(2.5)ADFR | 9.53 | 2.6 | 15 | 45 | | 3.97 | | | | | |
| | 1203ADTR | 42ADTR | 12.7 | 7 | 15 | 45 | 300 | 3.18 | | | | | |

LDCN

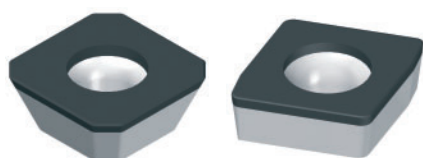
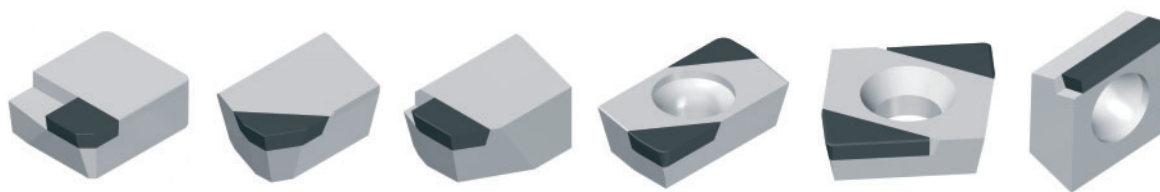
| Shape | ISO code | | Dimensions (mm) | | | | | | PCBN | | | | |
|---|----------|---------|-----------------|---|----------|------|-----|------|------|-------|------|------|-------|
| | Metric | Inch | W | Z | α | L | R | T | EB11 | EB210 | EB51 | EB71 | EB710 |
|  | LDCN | 190412R | 12.7 | | 15 | 19.1 | 1.2 | 4.76 | | | | | |
| | | 190412L | 12.7 | | 15 | 19.1 | 1.2 | 4.76 | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

OPHX

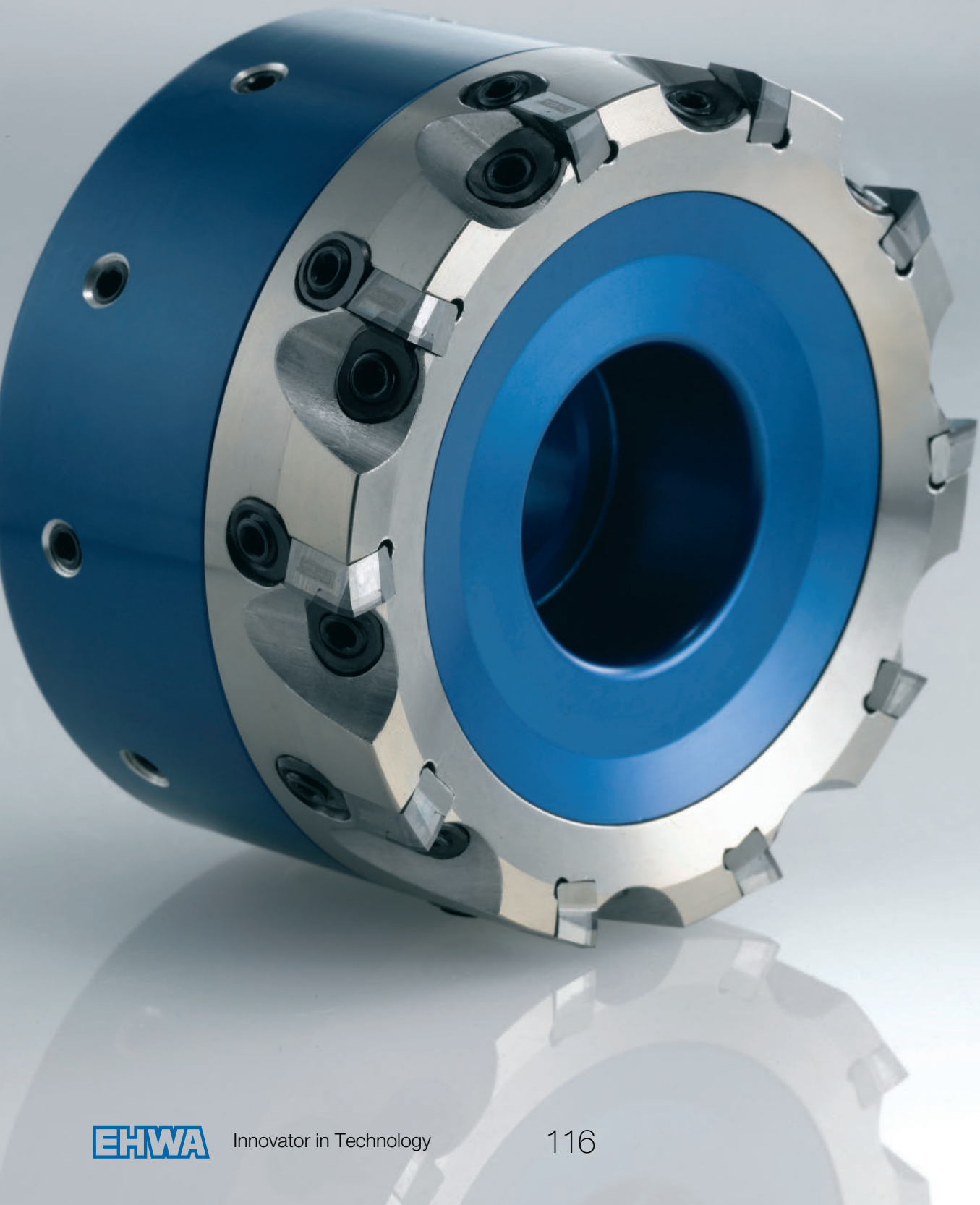
| Shape | ISO code | | Dimensions (mm) | | | | | | PCBN | | | | |
|--|----------|-----------|-----------------|---|----------|---|-----|------|------|-------|------|------|-------|
| | Metric | Inch | I.C | Z | α | V | R | T | EB11 | EB210 | EB51 | EB71 | EB710 |
|  | OPHX | 0504ZZN-R | 12.7 | | 11 | | - | 4.76 | | | | | |
| | | 0504ZZR | 12.7 | | 11 | | 300 | 4.76 | | | | | |
| | | 0504ZZL | 12.7 | | 11 | | 300 | 4.76 | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

Order made _ shape sample

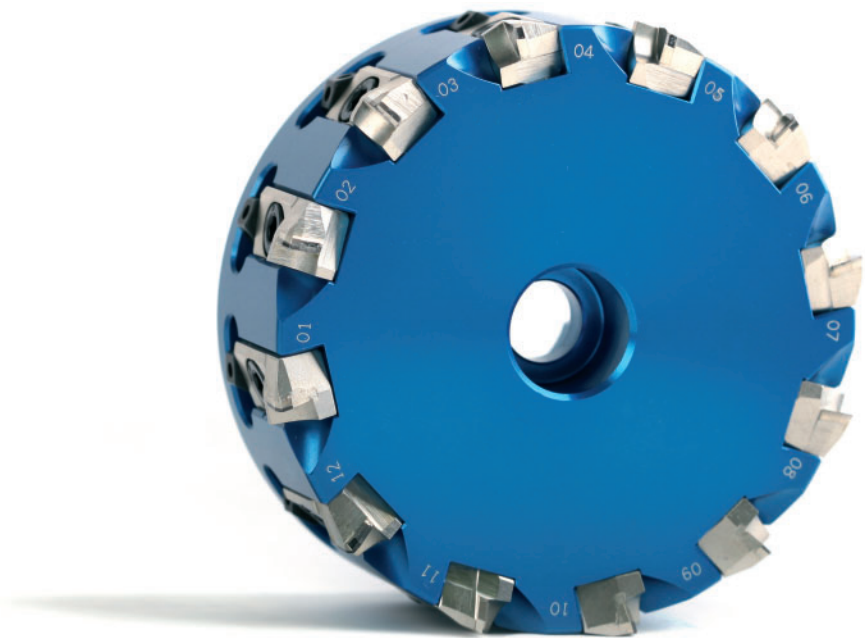
- Face, Slot, Chamfer, Profile, Etc.
- Customers can get optimized tooling service depending on their demand.



Milling_
Cutter body_Aluminum



Cutter body_Aluminum

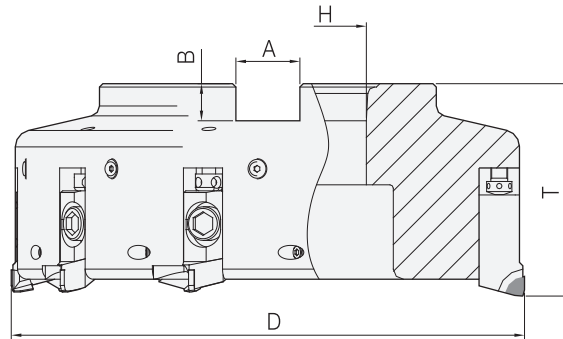


This is made of economical aluminum body with special insert for high-speed and high-precision cutting and also very easy to handle due to light weight.

- _ Easy to handle due to the light aluminum body
(Cf. Half heavier than the steel body)
- _ Excellent milling performance and quality
- _ Excellent durability and low cutting resistance
- _ High productivity and process stability

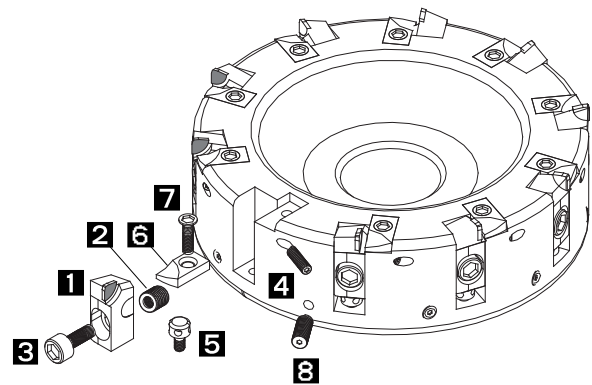
Cutter body_Aluminum

SD type



| Item No. Inch type | Dimensions (mm) | | | | | Tooth | Weight (kg) | Cartridge | Arbor |
|-----------------------|-----------------|--------|------|----|----|-------|----------------|---------------|------------|
| | ØD | Ød | L1 | L2 | L | | | | |
| SD 08050-6R(L) | 80 | 25.4 | 9.5 | 6 | 50 | 6 | 0.7 | ROUGH | FMA 25.4 |
| SD 10063-8R(L) | 100 | 31.75 | 12.7 | 8 | 50 | 8 | 1.0 | SD-R10-30 (R) | FMA 31.75 |
| SD 12563-10R(L) | 125 | 38.1 | 15.9 | 10 | 63 | 10 | 1.8 | SD-R10-30 (L) | FMA 38.1 |
| SD 16063-12R(L) | 160 | 50.8 | 19.0 | 11 | 63 | 12 | 2.9 | WIPER | FMA 50.8 |
| SD 20063-16R(L) | 200 | 47.625 | 25.4 | 14 | 63 | 16 | 4.5 | SD-F10-30 (R) | FMA 47.625 |
| SD 25063-18R(L) | 250 | 47.625 | 25.4 | 14 | 63 | 18 | 7.0 | SD-F10-30 (L) | FMA 47.625 |

- Shoulder type cartridge can be offered by customer's demand.



Spare parts

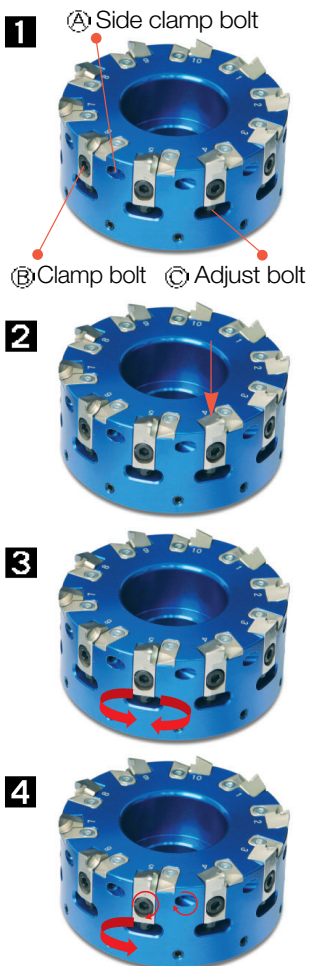
| | | | | |
|---|---|-----------------------------------|----------------------------------|-----------------------------------|
| 1 Cartridge (Rough) NA-R10-30 | 1 Cartridge (Wiper) NA-F10-30 | 2 Double Bolt M6xM10-8 | 3 Clamp Bolt M6x15 | 4 Side Clamp Bolt M6x10 |
| | | | | |
| 5 Adjust Bolt M5x0.8 | 6 Chip Cover 4x9.5x18 | 7 Chip Cover Bolt M4x10 | 8 Balancing Bolt M6x10 | 9 Coolant Bolt |
| | | | | |

- Every spare parts be offered by extra charge.

Cartridge_ SD type



| SDR | Item No. | Dimensions (mm) | | | | | | PCD | | | | |
|-----|--------------------|-----------------|----|----------|----|-----|----|------|------|-------|------|------|
| | | W | V | α | L | R | T | EP20 | EP55 | EP750 | EP58 | EP29 |
| | SDR | 13.5 | 15 | 11 | 30 | | 12 | | | | | |
| | SDR-A | 13.5 | 0 | 11 | 30 | | 12 | | | | | |
| | SDR-R | 13.5 | 15 | 11 | 30 | 0.4 | 12 | | | | | |
| | SDR-ES (EDGE HONE) | 13.5 | 15 | 11 | 30 | | 12 | | | | | |
| SDW | Item No. | Dimensions (mm) | | | | | | PCD | | | | |
| | | W | Z | α | L | R | T | EP20 | EP55 | EP750 | EP58 | EP29 |
| | SDW | 13 | | 11 | 30 | 400 | 12 | | | | | |
| | SDW-ES (EDGE HONE) | 13 | | 11 | 30 | 400 | 12 | | | | | |



Setting manual

1. Installaion of Cartridge

Install the (C) Adjust bolt on the cutter body, and insert the cartridge. After then, gently tightening the (B) Clamp bolt and (A) Side clamp bolt.

2. Installaion of bolt

When tightening, secure the cartridge by pressing it downward. And using a torque wrench, temporarily tighten the Clamp bolt and Side clamp bolt to 3N·m.

3. Cutting edge height adjustment

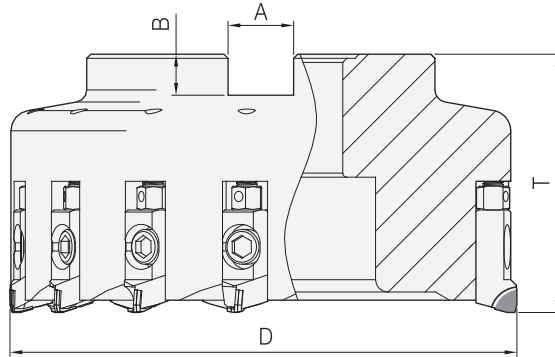
Turn the adjustment bolt and adjust so that the height of the front cutter is $-10\mu\text{m}$ from the target value.

4. Final adjustment

Using a torque wrench, tighten the Clamp bolt and Side clamp bolt to 10N·m. And turn the adjustment bolt, then adjust to the target height.

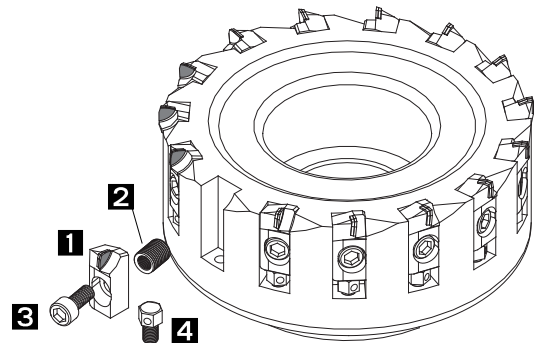
Cutter body_Aluminum

HF type









| Item No. Inch type | Dimensions (mm) | | | | | Tooth | Weight (kg) | Cartridge | Arbor |
|-----------------------|-----------------|--------|------|----|----|-------|----------------|----------------------------|--------------------------|
| | ∅D | ∅d | L1 | L2 | L | | | | |
| MA 08050-10R(L) | 80 | 25.4 | 9.5 | 6 | 50 | 10 | 0.7 | ROUGH | FMA 25.4 |
| MA 10063-12R(L) | 100 | 31.75 | 12.7 | 8 | 50 | 12 | 1.0 | MA-R8-25(F) MA-R8-25(L) | FMA 31.75 FMA 38.1 |
| MA 12563-15R(L) | 125 | 38.1 | 15.9 | 10 | 63 | 15 | 1.8 | WIPER | FMA 50.8 |
| MA 16063-18R(L) | 160 | 50.8 | 19.0 | 11 | 63 | 18 | 2.9 | MA-F8-25(F) MA-F8-25(L) | FMA 47.625 FMA 47.625 |
| MA 25063-24R(L) | 200 | 47.625 | 25.4 | 14 | 63 | 24 | 4.5 | | |
| MA 25063-30R(L) | 250 | 47.625 | 25.4 | 14 | 63 | 30 | 7.0 | | |

- Shoulder type cartridge can be offered by customer's demand.



Spare parts

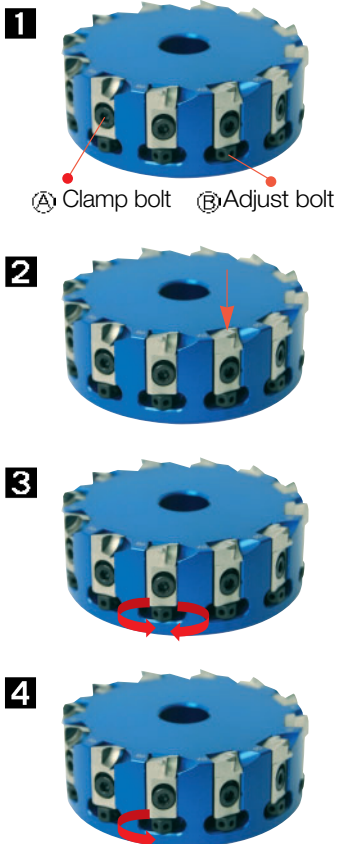
| 1 Cartridge (Rough) MA-R8-25 | 1 Cartridge (Wiper) MA-F8-25 | 2 Double Bolt M8M5-7 | 3 Clamp Bolt M5x12 | 4 Adjust Bolt M5x8 | Coolant Bolt |
|---|---|---|---|---|---|
|  |  |  |  |  |  |

- Every spare parts be offered by extra charge.

Cartridge_ High feed type



| HFR | Item No. | Dimensions (mm) | | | | | | PCD | | | | |
|-----|----------|-----------------|----|----------|----|-----|----|------|------|-------|------|------|
| | | W | Z | α | L | R | T | EP20 | EP55 | EP750 | EP58 | EP29 |
| | HFR | 10 | 15 | 11 | 25 | | 11 | | | | | |
| | HFR-A | 10 | 0 | 11 | 25 | | 11 | | | | | |
| | HFR-R | 10 | 15 | 11 | 25 | 0.4 | 11 | | | | | |
| | HFR-ES | 10 | 15 | 11 | 25 | | 11 | | | | | |
| HFW | Item No. | Dimensions (mm) | | | | | | PCD | | | | |
| | | W | Z | α | L | R | T | EP20 | EP55 | EP750 | EP58 | EP29 |
| | HFW | 9.8 | | | 25 | 400 | 11 | | | | | |
| | HFW-ES | 9.8 | | | 25 | 400 | 11 | | | | | |



Setting manual

1. Installaion of Cartridge

Install the (B) adjust bolt on the cutter body, and insert the cartridge. After then, gently tightening the (A) Clamp bolt.

2. Installaion of bolt

When tightening, secure the cartridge by pressing it downward. And using a torque wrench, temporarily tighten the Clamp bolt 3N·m.

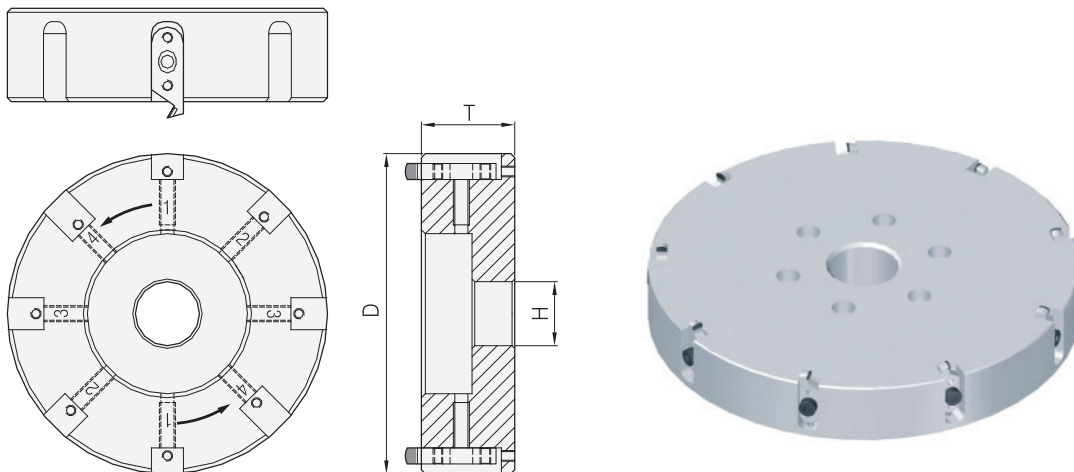
3. Cutting edge height adjustment

Turn the adjustment bolt and adjust so that the height of the front cutter is $-10\mu\text{m}$ from the target value.

4. Final adjustment

Using a torque wrench, tighten the Clamp Bolt to 10N·m. And turn the adjustment bolt, then adjust to the target height.

Cutter body_Aluminum



| Item No. Inch type | Dimensions (mm) | | | |
|-----------------------|-----------------|----|----|----|
| | D | Z | H | T |
| 120D-35T-24H-10Z-RH | 120 | 10 | 24 | 35 |
| 120D-35T-24H-10Z-LH | 120 | 10 | 24 | 35 |
| 158D-40T-70H-6Z-RH | 158 | 6 | 70 | 40 |
| 158D-40T-70H-6Z-LH | 158 | 6 | 70 | 40 |
| 198D-45T-40H-6Z-RH | 198 | 6 | 40 | 45 |
| 198D-45T-40H-6Z-LH | 198 | 6 | 40 | 45 |
| 220D-40T-65H-6Z-RH | 220 | 6 | 65 | 40 |
| 220D-40T-65H-6Z-LH | 220 | 6 | 65 | 40 |
| 248D-45T-40H-12Z-RH | 248 | 12 | 40 | 45 |
| 248D-45T-40H-12Z-LH | 248 | 12 | 40 | 45 |

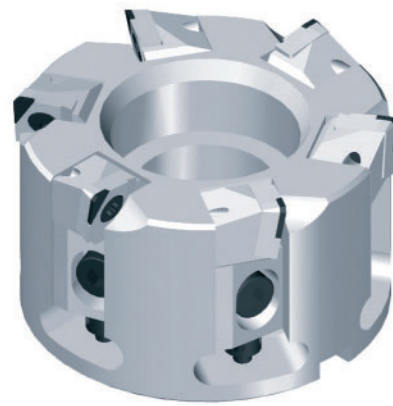
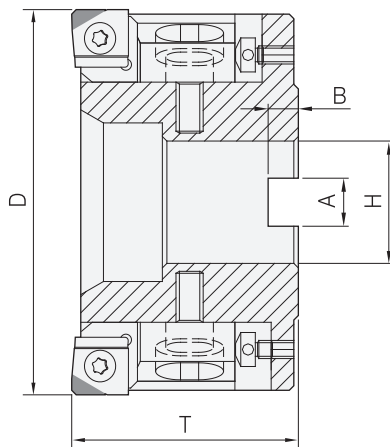
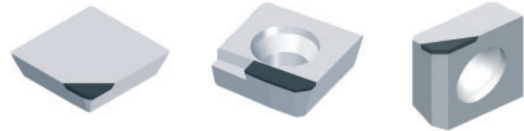
Milling



Cutter body_Aluminum

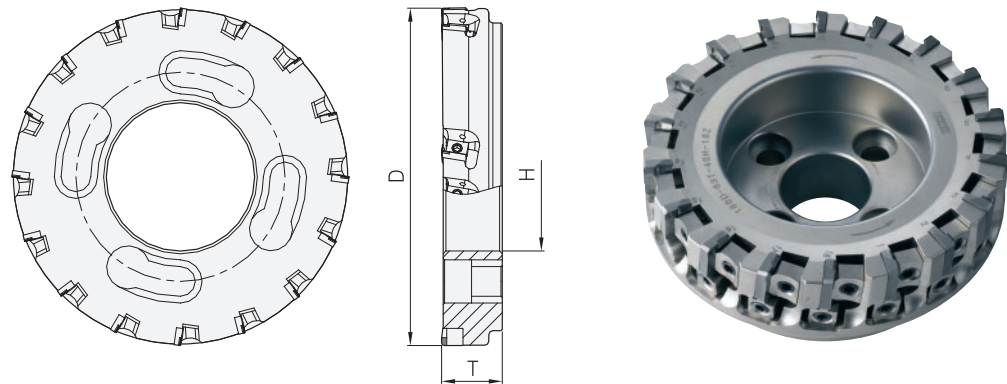
Order made

- PCD inserts and Cartridges can be customized.
- Samples are requested for Cartridge production.



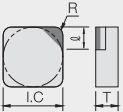
Milling_
Cutter body_Steel





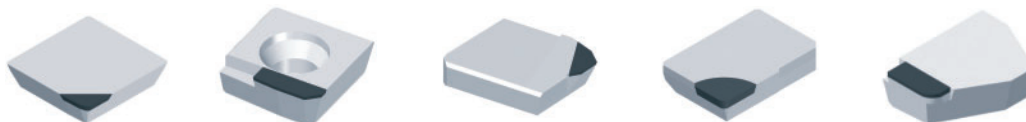
| Item No. Inch type | Dimensions (mm) | | | |
|-----------------------|-----------------|----|--------|----|
| | D | Z | H | T |
| 125D-63T-40H-16Z | 125 | 16 | 40 | 63 |
| 160D-63T-40H-18Z | 160 | 18 | 40 | 63 |
| 200D-63T-60H-12Z | 200 | 12 | 60 | 63 |
| 250D-63T-50H-24Z | 250 | 24 | 50 | 63 |
| 250D-45T-109.88H-16Z | 250 | 16 | 109.88 | 45 |

SNGN

| Shape | ISO code | | Dimensions (mm) | | | | | | | PCBN | | | | |
|---|---------------|-------------|-----------------|---|----------|----|-----|------|------|------|-------|------|------|-------|
| | Metric | Inch | W | Z | α | V | R | T | L | EB11 | EB210 | EB51 | EB71 | EB710 |
|  | SNGN 1506APTR | SNGN 54APTR | 12.7 | 5 | 11 | 45 | 250 | 6.35 | 15.9 | | | | | |
| | 1506APTL | 54APTL | 12.7 | 5 | 11 | 45 | 250 | 6.35 | 15.9 | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |

Order made

- PCBN inserts and Cartridges can be customized.
- Samples and drawings are requested for the original cutter body.

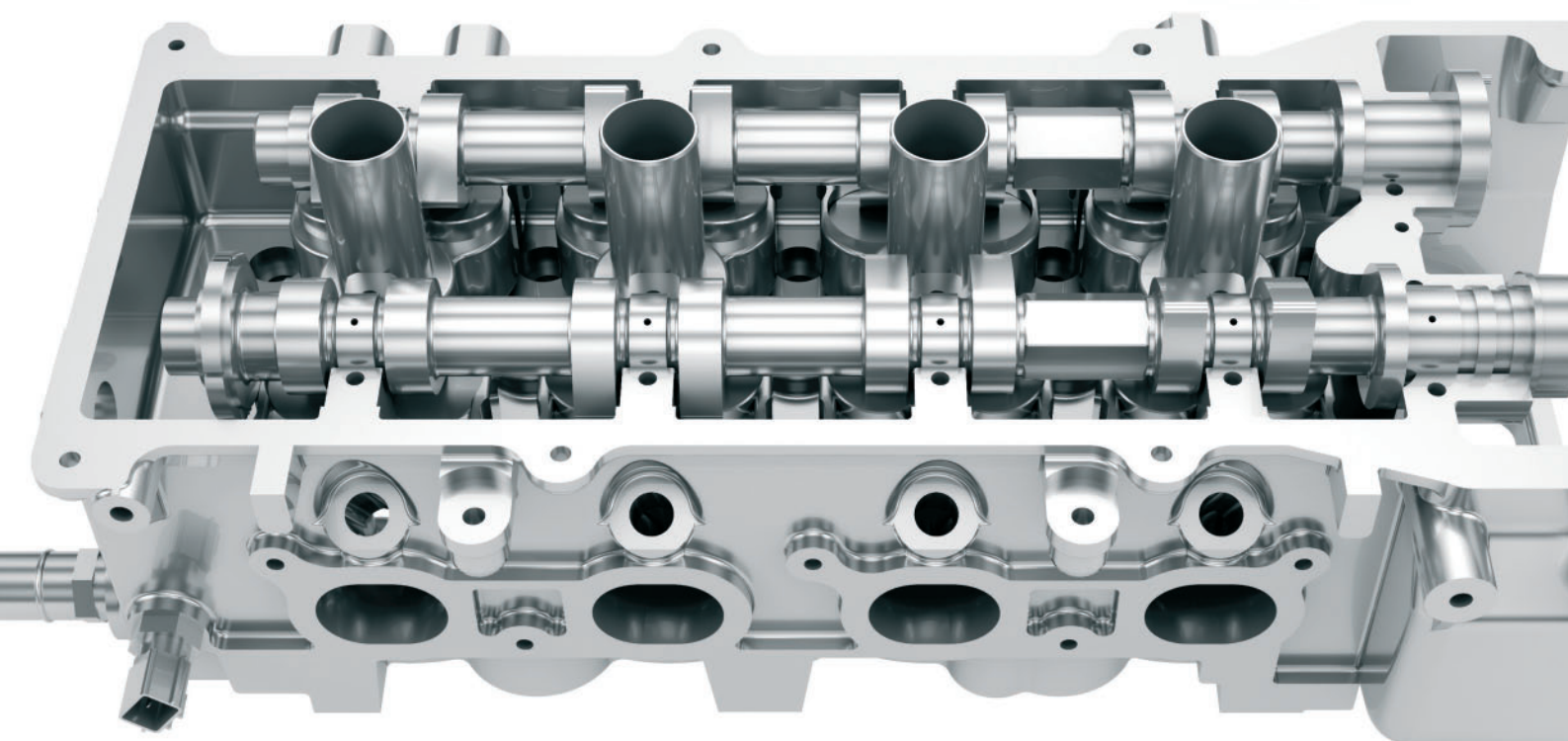




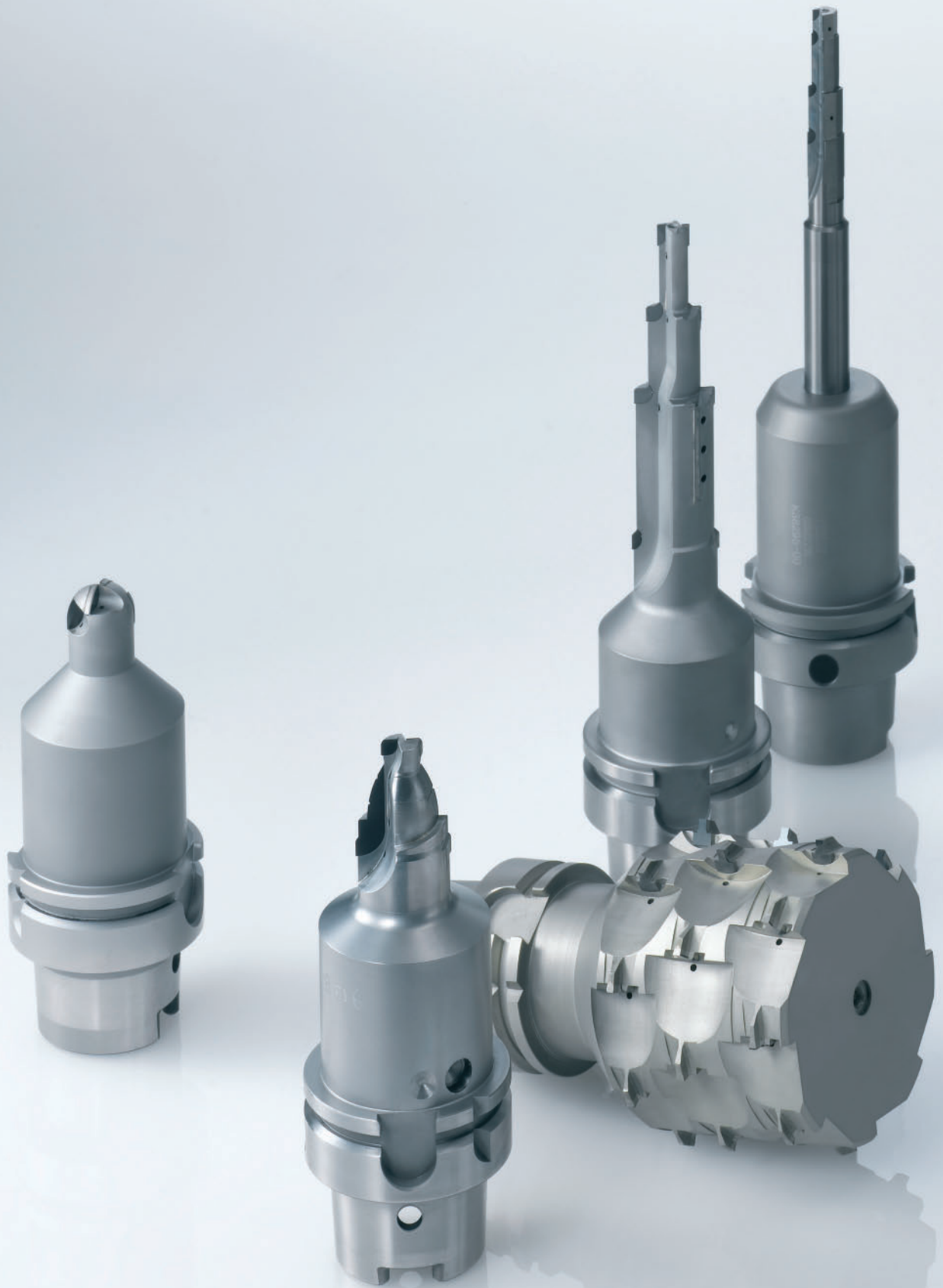
Rotating



Applicable to all common cutting tools such as high-speed steel, solid carbide, carbide-tipped, cermet, PCD, and PCBN, with or without internal coolant.



Rotating

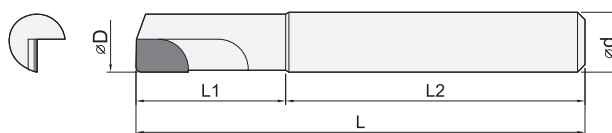






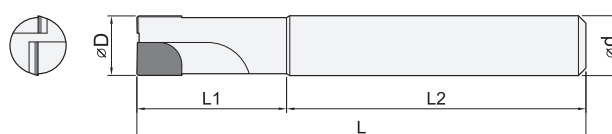
Rotating-
Endmill

Square type (1Z)



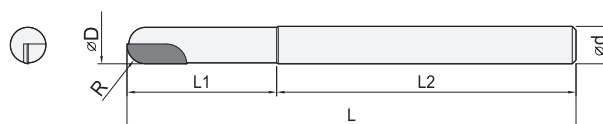
| Item No. | Dimensions (mm) | | | | | |
|------------------|-----------------|----|----|----|----|---|
| | øD | ød | L1 | L2 | L | Z |
| EDEF 10303-15-60 | 3 | 3 | 15 | 45 | 60 | 1 |
| 10404-15-60 | 4 | 4 | 15 | 45 | 60 | 1 |
| 10505-15-60 | 5 | 5 | 15 | 45 | 60 | 1 |
| 10606-15-60 | 6 | 6 | 15 | 45 | 60 | 1 |

Square type (2Z)



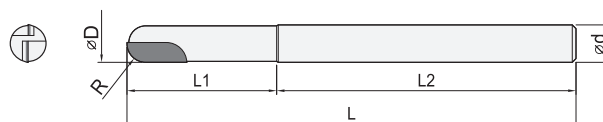
| Item No. | Dimensions (mm) | | | | | |
|------------------|-----------------|----|----|----|----|---|
| | øD | ød | L1 | L2 | L | Z |
| EDEF 20606-15-60 | 6 | 6 | 15 | 45 | 60 | 2 |
| 20808-15-60 | 8 | 8 | 15 | 45 | 60 | 2 |
| 21010-25-80 | 10 | 10 | 25 | 55 | 80 | 2 |
| 21212-25-80 | 12 | 12 | 25 | 55 | 80 | 2 |

Ball nose type (1Z)



| Item No. | Dimensions (mm) | | | | | | |
|------------------|-----------------|----|-----|----|----|----|---|
| | øD | ød | R | L1 | L2 | L | Z |
| EDEB 10303-15-60 | 3 | 3 | 1.5 | 15 | 45 | 60 | 1 |
| 10404-15-60 | 4 | 4 | 2 | 15 | 45 | 60 | 1 |
| 10505-15-60 | 5 | 5 | 2.5 | 15 | 45 | 60 | 1 |
| 10606-15-60 | 6 | 6 | 3 | 15 | 45 | 60 | 1 |

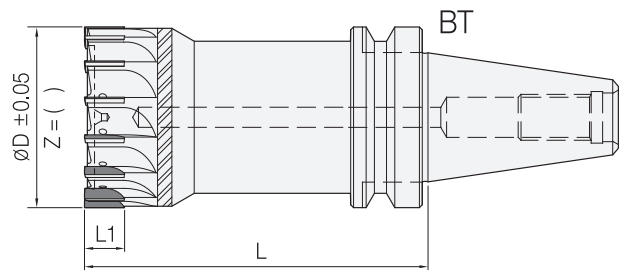
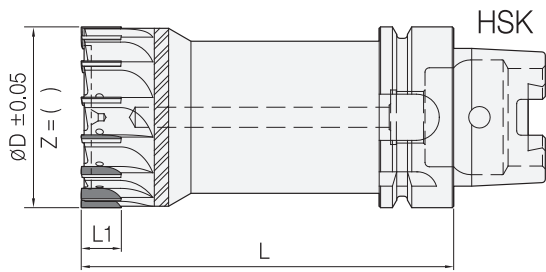
Ball nose type (2Z)



| Item No. | Dimensions (mm) | | | | | | |
|------------------|-----------------|----|---|----|----|----|---|
| | øD | ød | R | L1 | L2 | L | Z |
| EDEB 20606-15-60 | 6 | 6 | 3 | 15 | 45 | 60 | 2 |
| 20808-15-60 | 8 | 8 | 4 | 15 | 45 | 60 | 2 |
| 21010-25-80 | 10 | 10 | 5 | 25 | 55 | 80 | 2 |
| 21212-25-80 | 12 | 12 | 6 | 25 | 55 | 80 | 2 |

Endmill

Monoblock type

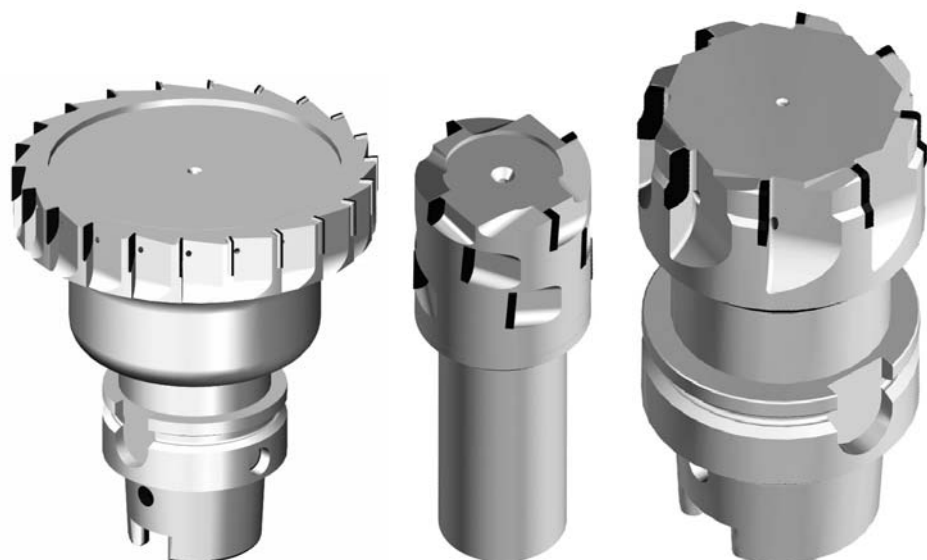
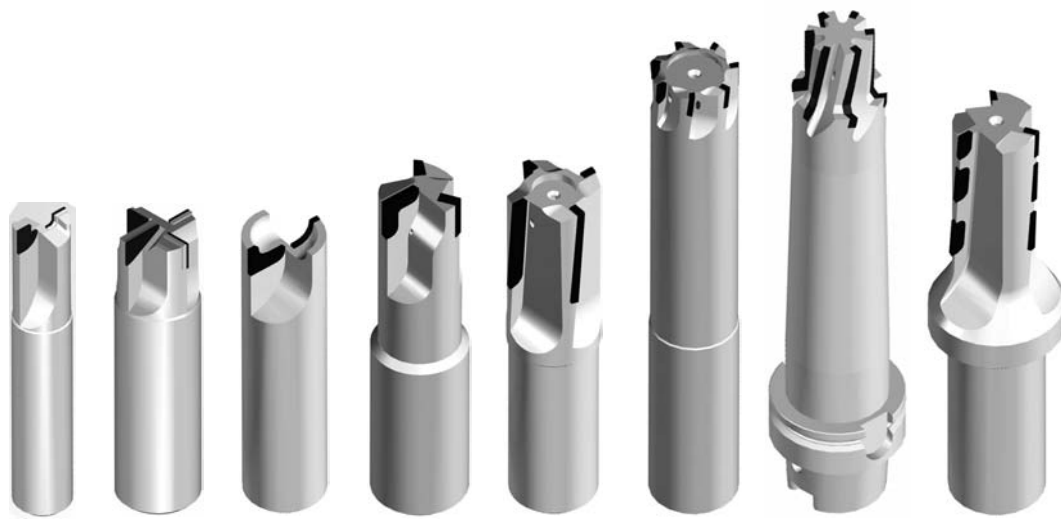


| Item No. | Dimensions (mm) | | | | | type |
|------------------|-----------------|----|----|-----|--|---------|
| | $\varnothing D$ | Z | L1 | L | | |
| EDEF 0832-HSKA63 | 32 | 8 | 14 | 150 | | HSKA63 |
| 0840-HSKA63 | 40 | 8 | 14 | 150 | | HSKA63 |
| 0850-HSKA63 | 50 | 8 | 14 | 150 | | HSKA63 |
| 1463-HSKA63 | 63 | 14 | 14 | 150 | | HSKA63 |
| 1463-HSKA100 | 63 | 14 | 14 | 150 | | HSKA100 |
| 1463-BT40 | 63 | 14 | 14 | 150 | | BT40 |

• 제작가능품목 : HSKA 32 / HSKA 40 / HSKA 50 / HSKA 63 / HSKA 100 / BT 30 / BT40 / BT50

Order made _ shape sample

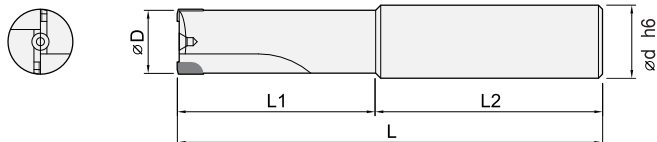
- Face, Slot, Chamfer, Profile, Etc.
- Customers can get optimized tooling service depending on their demand.



Rotating_
Reamer



Normal Type



| Item No. | Dimensions (mm) | | | | | |
|-------------------------|-----------------|-----------------|----|----|-----|---|
| | $\varnothing D$ | $\varnothing d$ | L1 | L2 | L | Z |
| EDRF 20406-15-60 | 4 | 6 | 15 | 45 | 60 | 2 |
| 20506-15-60 | 5 | 6 | 15 | 45 | 60 | 2 |
| 20606-25-80 | 6 | 6 | 25 | 55 | 80 | 2 |
| 20808-25-80 | 8 | 8 | 25 | 55 | 80 | 2 |
| 21010-40-100 | 10 | 10 | 40 | 60 | 100 | 2 |
| 21212-40-100 | 12 | 12 | 40 | 60 | 100 | 2 |

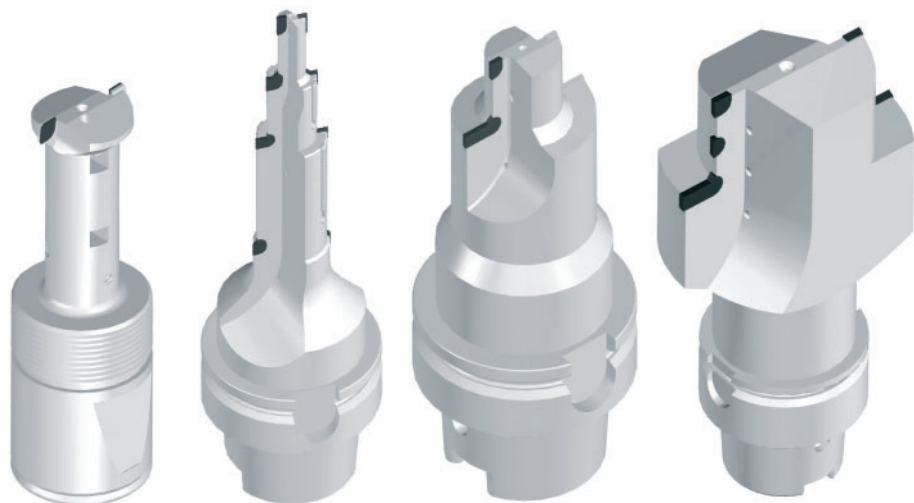
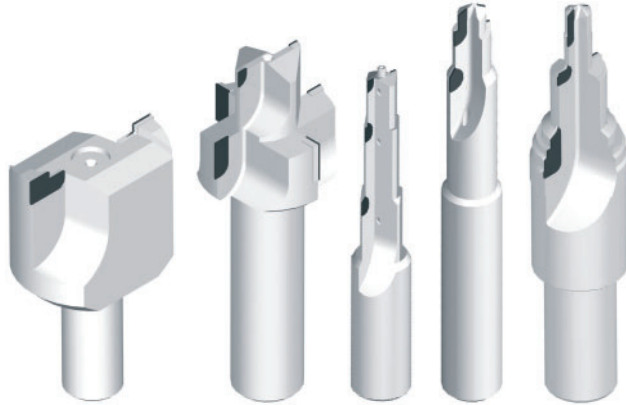






Order made _ shape sample

- Face, Slot, Chamfer, Profile, Etc.
- Customers can get optimized tooling service depending on their demand.



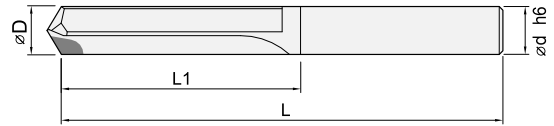


Rotating_
Drill

Rotating

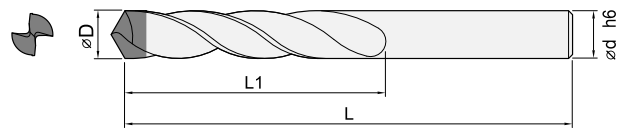
Drill

PCD Burnishing Drill



| Item No. | Dimensions (mm) | | | |
|-------------------------|-----------------|----|-----|----|
| | øD | L1 | L | ød |
| EDBD 20505-30-80 | 5 | 30 | 80 | 5 |
| 20606-30-80 | 6 | 30 | 80 | 6 |
| 20707-35-90 | 7 | 35 | 90 | 7 |
| 20808-35-90 | 8 | 35 | 90 | 8 |
| 20909-40-100 | 9 | 40 | 100 | 9 |
| 21010-40-100 | 10 | 40 | 100 | 10 |
| 21111-50-110 | 11 | 50 | 110 | 11 |
| 21212-50-110 | 12 | 50 | 110 | 12 |

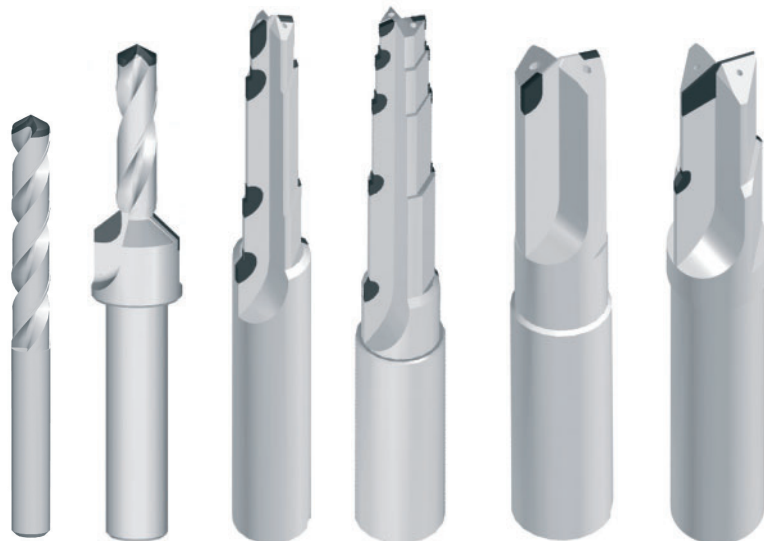
PCD Helical Drill



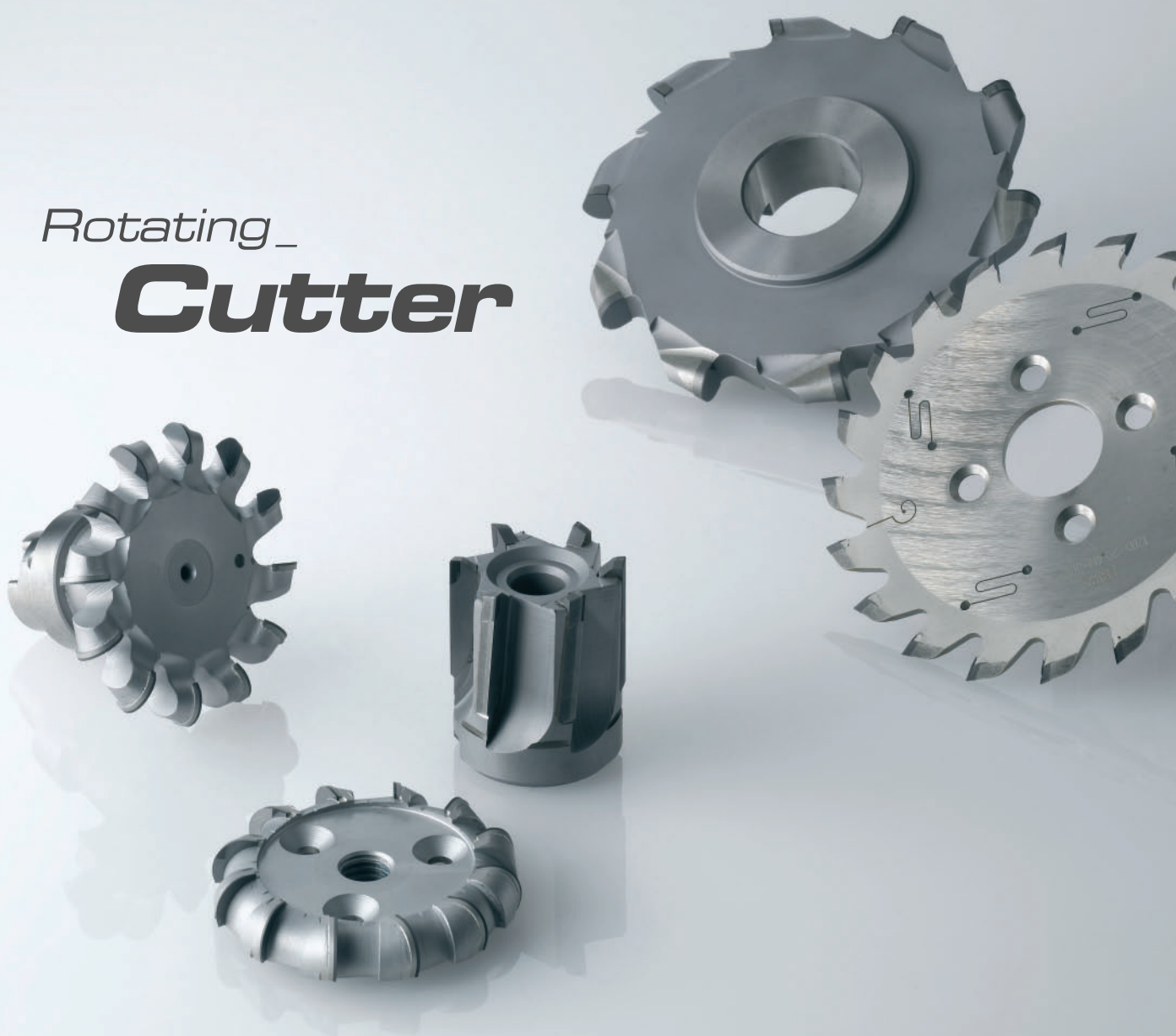
| Item No. | Dimensions (mm) | | | |
|-------------------------|-----------------|----|-----|----|
| | øD | L1 | L | ød |
| EDHD 20303-30-80 | 3 | 30 | 80 | 3 |
| 20404-30-80 | 4 | 30 | 80 | 4 |
| 20505-30-80 | 5 | 30 | 80 | 5 |
| 20606-30-80 | 6 | 30 | 80 | 6 |
| 20707-35-90 | 7 | 35 | 90 | 7 |
| 20808-35-90 | 8 | 35 | 90 | 8 |
| 20909-40-100 | 9 | 40 | 100 | 9 |
| 21010-40-100 | 10 | 40 | 100 | 10 |
| 21111-50-110 | 11 | 50 | 110 | 11 |
| 21212-50-110 | 12 | 50 | 110 | 12 |

Order made _ shape sample

- Face, Slot, Chamfer, Profile, Etc.
- Customers get optimized tooling service depending on their demand.

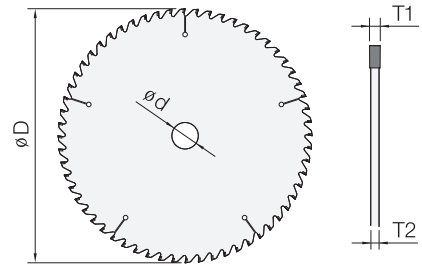


Rotating_
Cutter



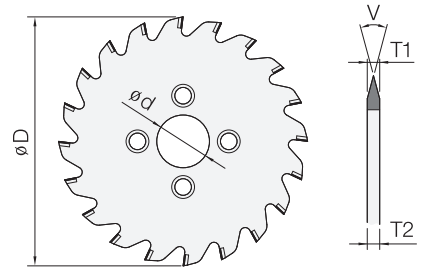
Rotating

PCD Saw



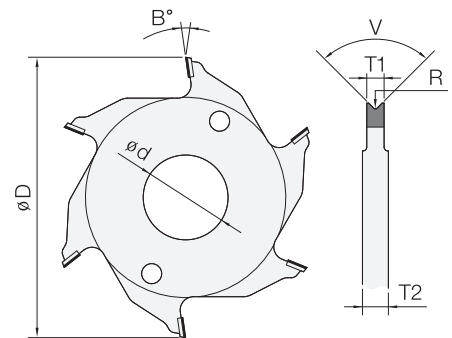
| Item No. | Dimensions (mm) | | | | |
|-------------|-----------------|-----------------|---------------------|-----|--------------|
| | $\varnothing D$ | $\varnothing d$ | T1 | T2 | Z |
| PCD-CTX 255 | 255 | 25.4 / 31.75 | 2.2 / 2.5 / 3 / 3.2 | 2.2 | 40 / 60 / 80 |
| PCD-CTX 305 | 305 | 25.4 / 31.75 | 2.2 / 2.5 / 3 / 3.2 | 2.2 | 40 / 60 / 80 |
| PCD-CTX 355 | 355 | 25.4 / 31.75 | 2.2 / 2.5 / 3 / 3.2 | 2.2 | 40 / 60 / 80 |

PCD V-Cutter



| Item No. | Dimensions (mm) | | | | | |
|---------------|-----------------|-----------------|----|----|-----------------|---------|
| | $\varnothing D$ | $\varnothing d$ | T1 | T2 | V | Z |
| PCD-CTX 100-V | 100 | 20 / 25.4 | 2 | 2 | 35° / 40° / 45° | 20 / 30 |
| PCD-CTX 105-V | 105 | 20 / 25.4 | 2 | 2 | 35° / 40° / 45° | 20 / 30 |
| PCD-CTX 110-V | 110 | 20 / 25.4 | 2 | 2 | 35° / 40° / 45° | 20 / 30 |
| PCD-CTX 120-V | 120 | 20 / 25.4 | 2 | 2 | 35° / 40° / 45° | 20 / 30 |

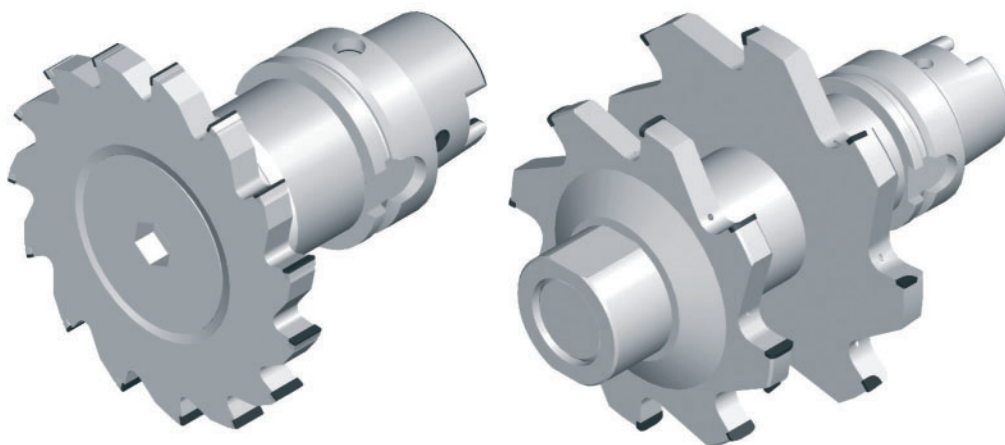
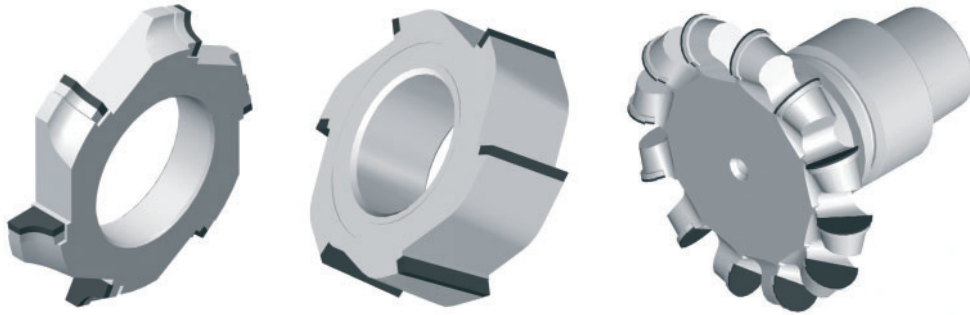
PCD Bevel Cutter

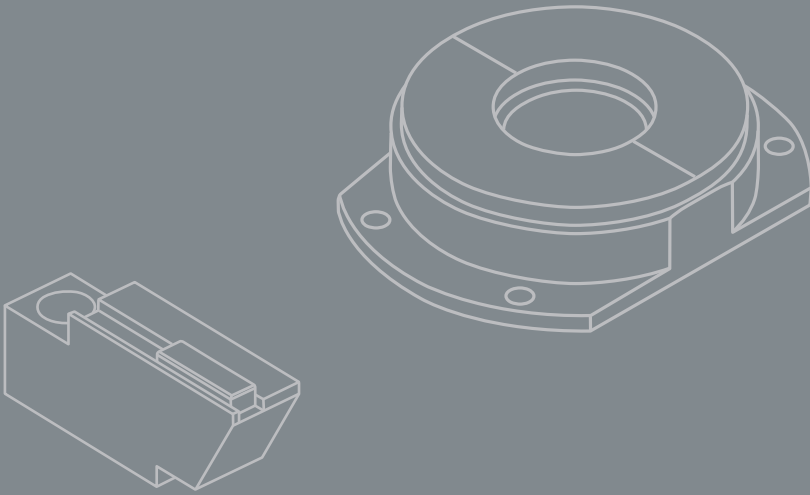


| Item No. | Dimensions (mm) | | | | | | |
|--------------|-----------------|-----------------|----|---------------|-----------------|---------------|-------------------|
| | $\varnothing D$ | $\varnothing d$ | T1 | T2 | V | R | B |
| PCD-CTX 80-B | 80 | 25.4 | 5 | 6.5 / 7 / 7.5 | 40° / 60° / 90° | 0.2 / 0.5 / 1 | 3° / 4° / 6° / 8° |
| PCD-CTX 83-B | 83 | 25.4 | 5 | 6.5 / 7 / 7.5 | 40° / 60° / 90° | 0.2 / 0.5 / 1 | 3° / 4° / 6° / 8° |
| PCD-CTX 90-B | 90 | 25.4 | 5 | 6.5 / 7 / 7.5 | 40° / 60° / 90° | 0.2 / 0.5 / 1 | 3° / 4° / 6° / 8° |

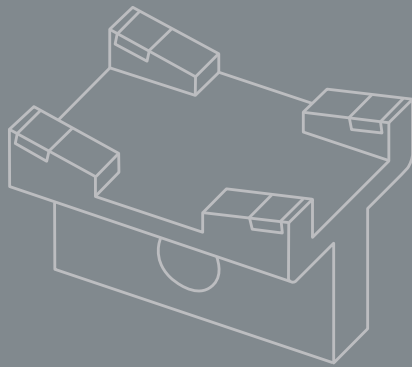
Order made _ shape sample

- Face, Slot, Chamfer, Profile, Etc.
- Customers can get optimized tooling service depending on their demand.





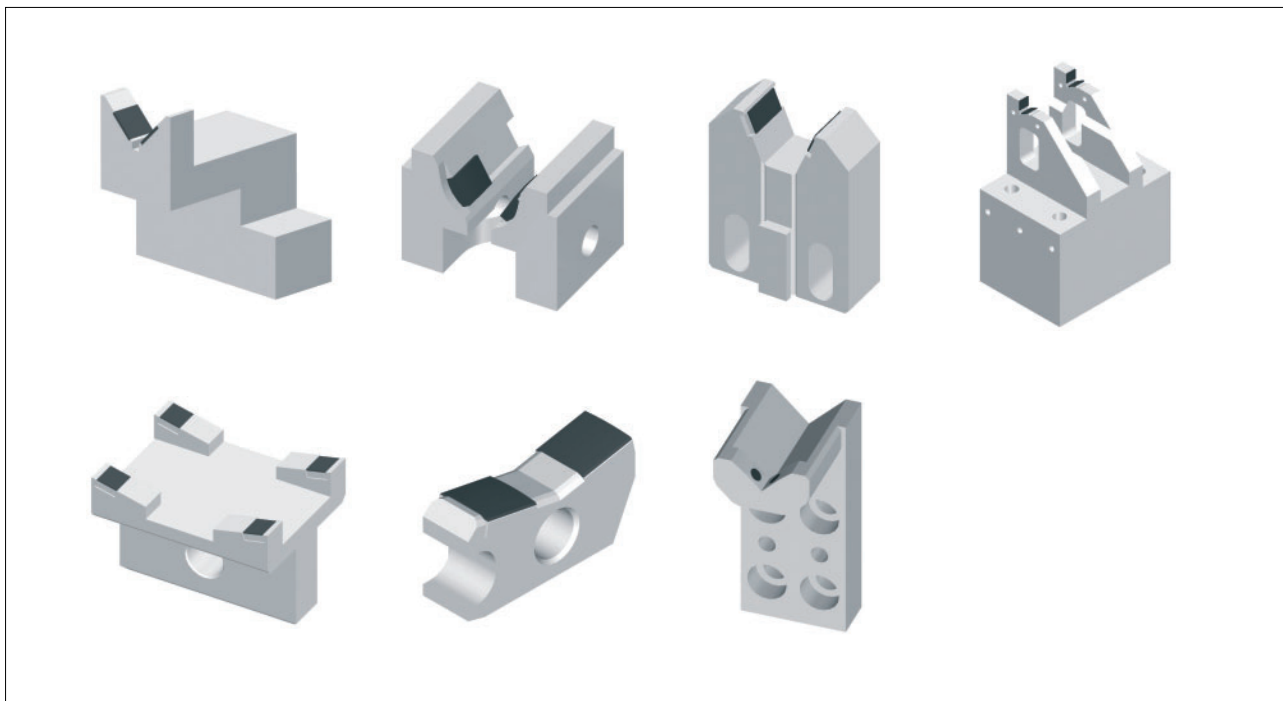
Wearless



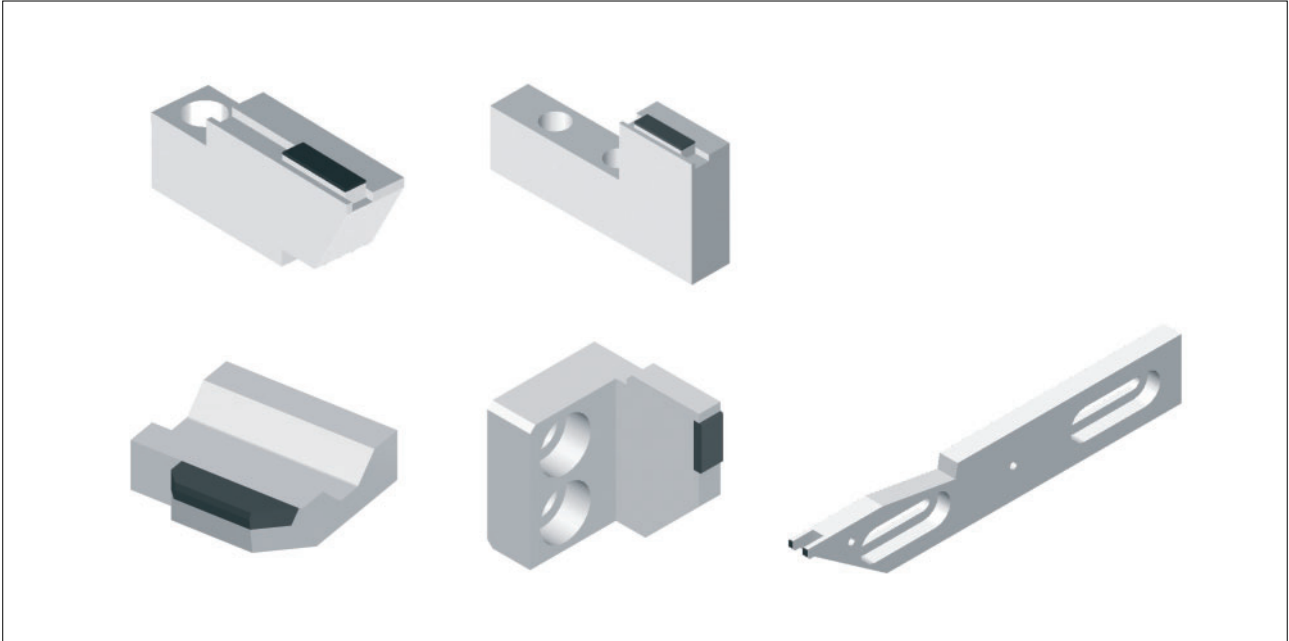
Backing plate



V-block



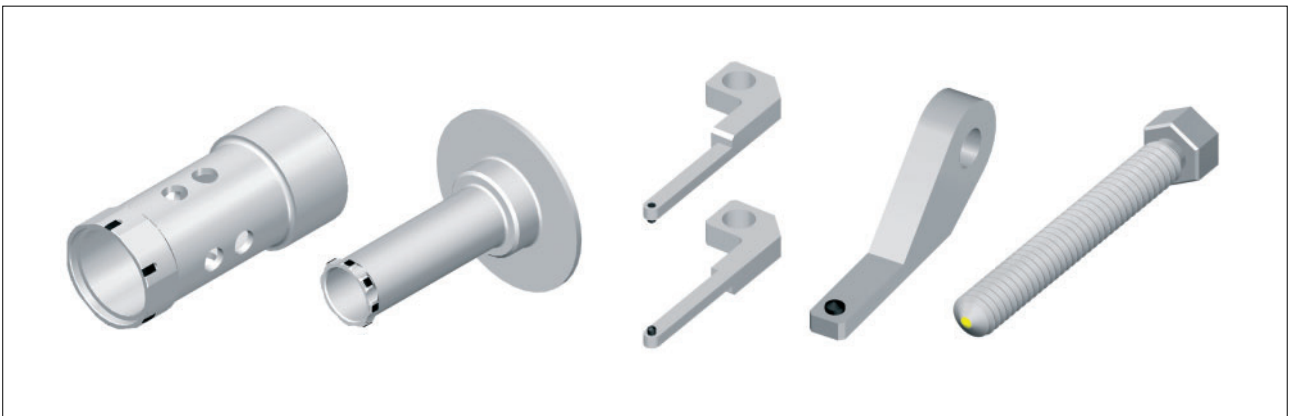
Shoe

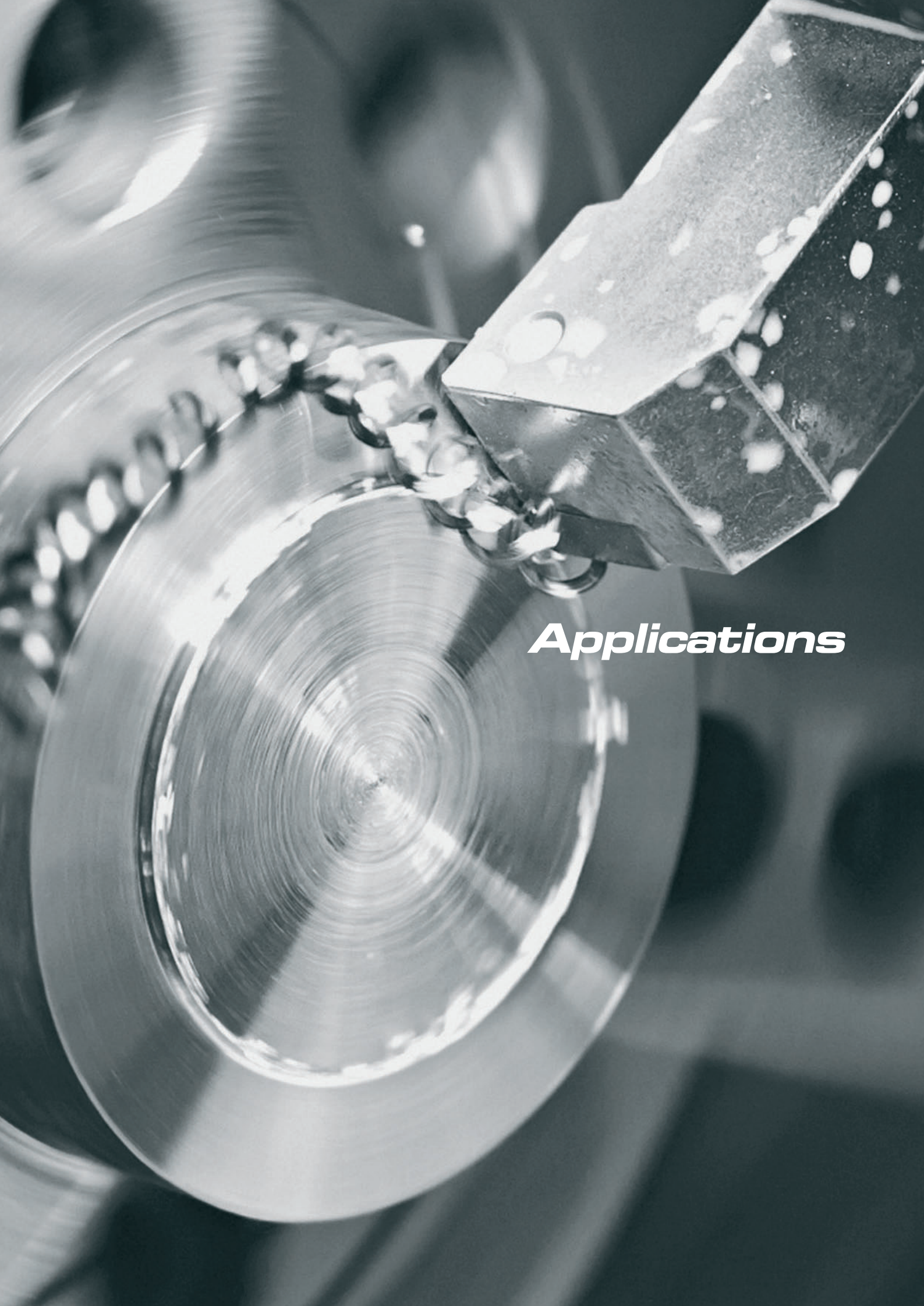


Dead center



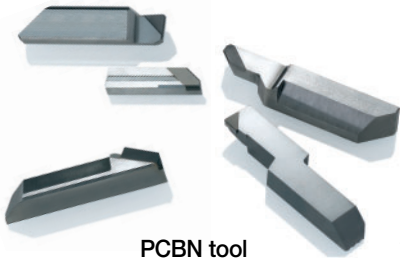
Special gauges





Applications

Automotive Cylinder head (Al alloy)



PCBN tool
Valve seat spot facing
(rough & finish)



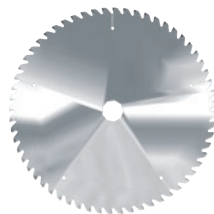
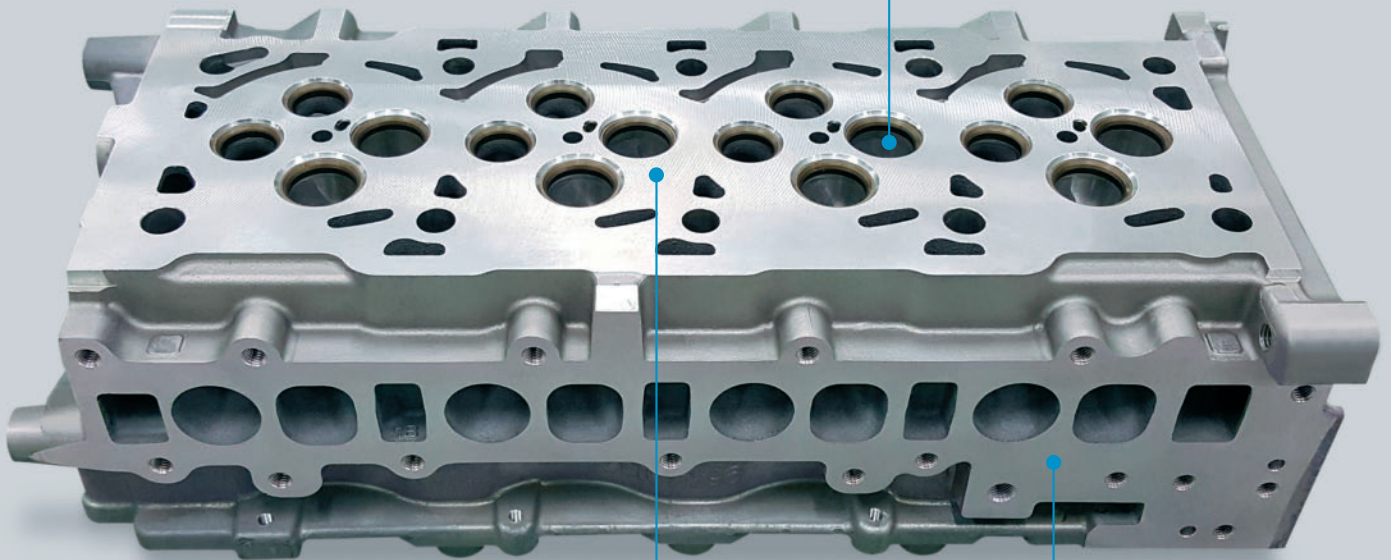
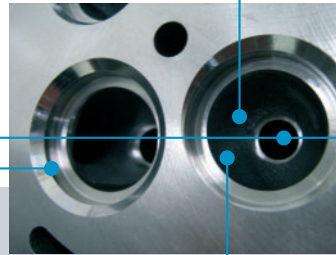
PCD reamer
Valve guide reaming
Valve seat spot facing
(rough & finish)



PCD endmill
Valve seat port hole cutting (rough)



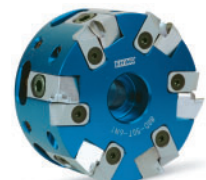
PCD step reamer
Valve seat & guide reaming
(finish)



PCD cutter
Mold excess cutting



PCD milling cutter
Top face milling
(rough & finish)



PCD milling cutter
Manifold face milling
(rough & finish)

Automotive Cylinder head (Al alloy)



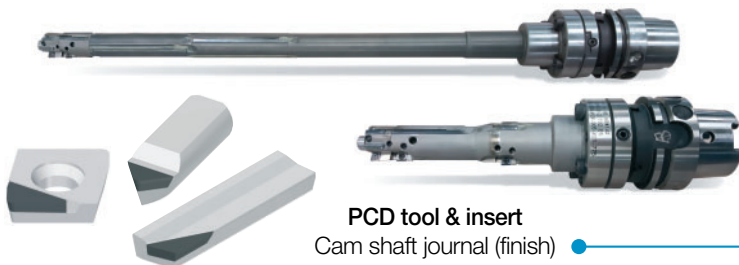
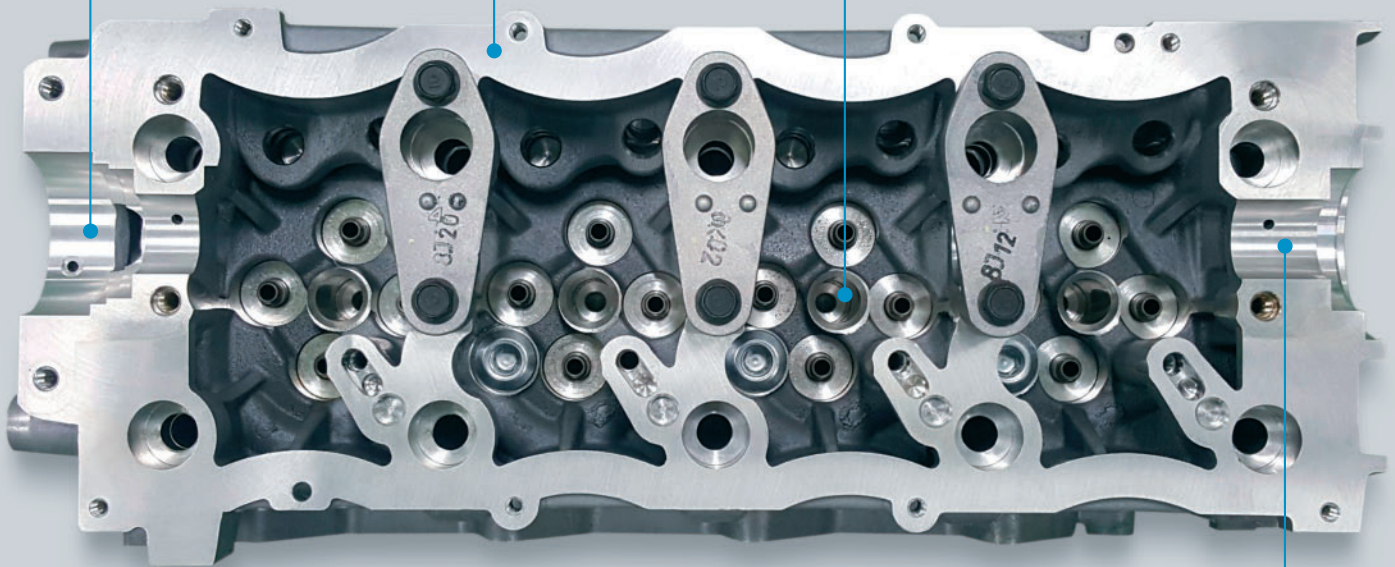
PCD boring tool
Oil seal bore spot boring
(rough & finish)



PCD milling cutter
Bottom face milling
(rough & finish)



PCD step reamer
Inject hole reaming
(finish)



PCD tool & insert
Cam shaft journal (finish)

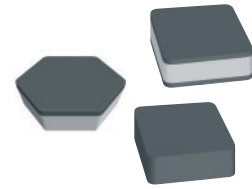


PCD ball endmill
Cam shaft journal (rough)

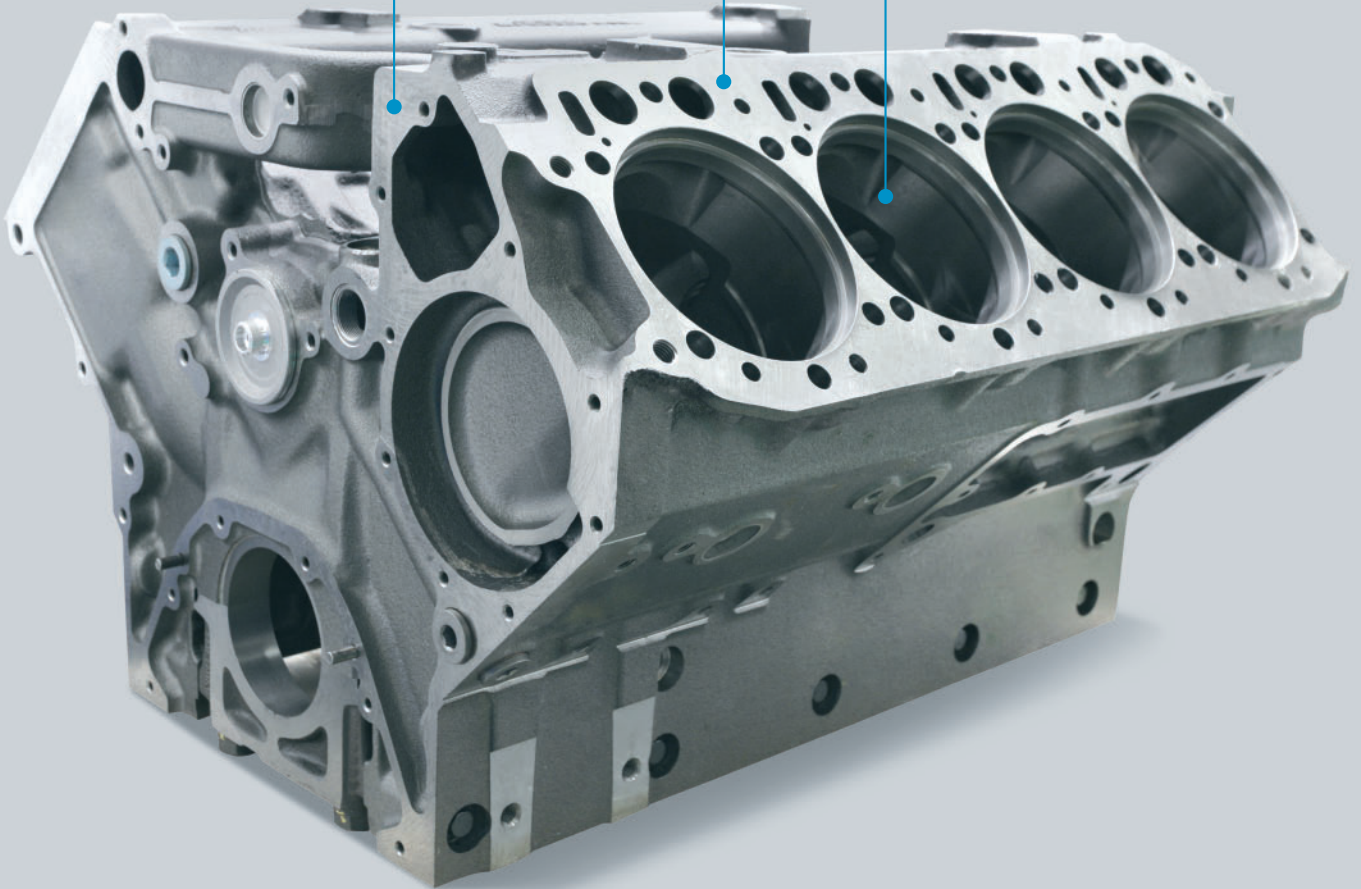
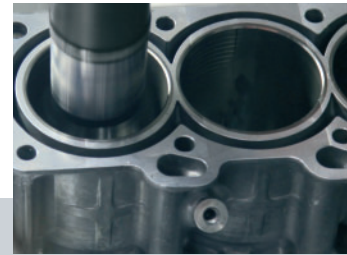
Automotive Cylinder block (cast iron)



PCBN milling cutter
Top, front & rear face milling (finish)



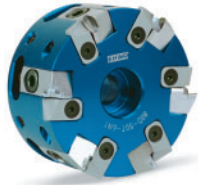
PCBN insert
Cylinder boring (rough & finish)



Automotive Transmission housing (Al alloy)



PCD reamer
Reaming



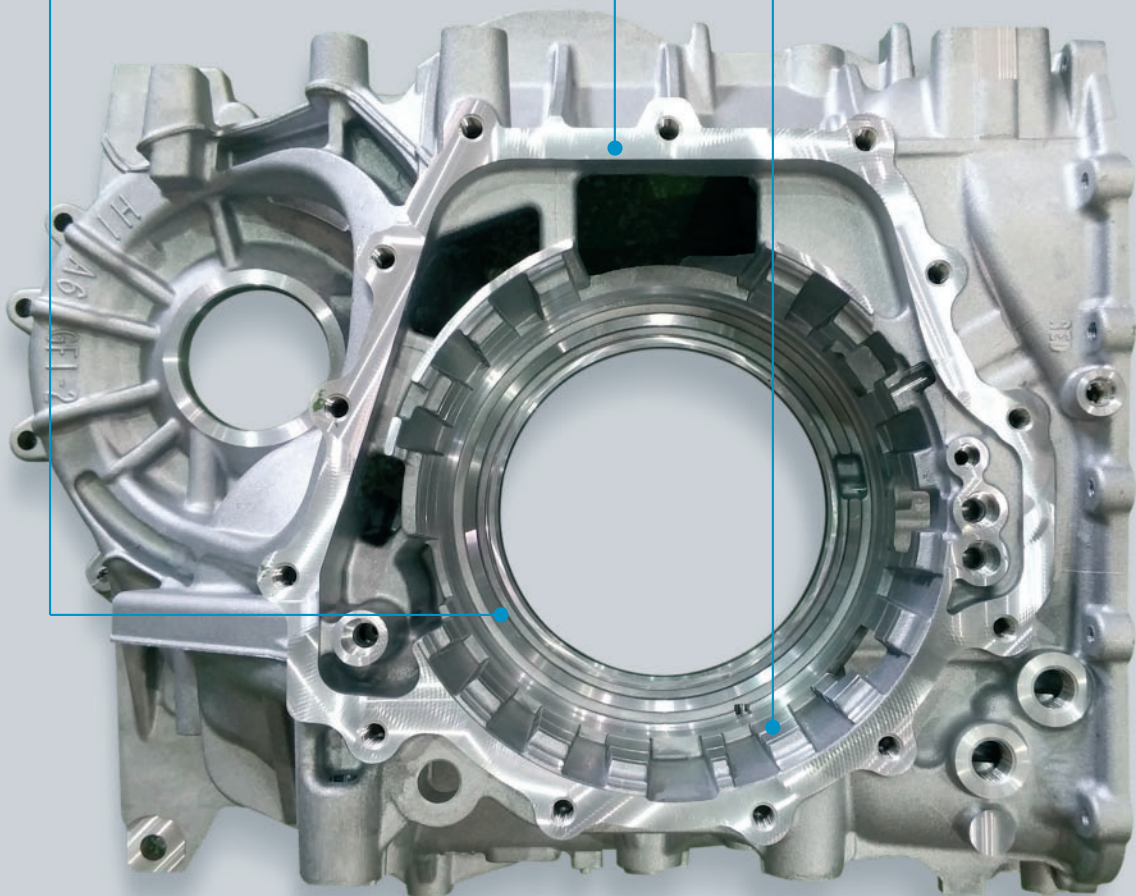
PCD milling cutter
Face milling (rough & finish)



PCD monoblock endmill
Face milling (rough & finish)



PCD monoblock cutter
Grooving

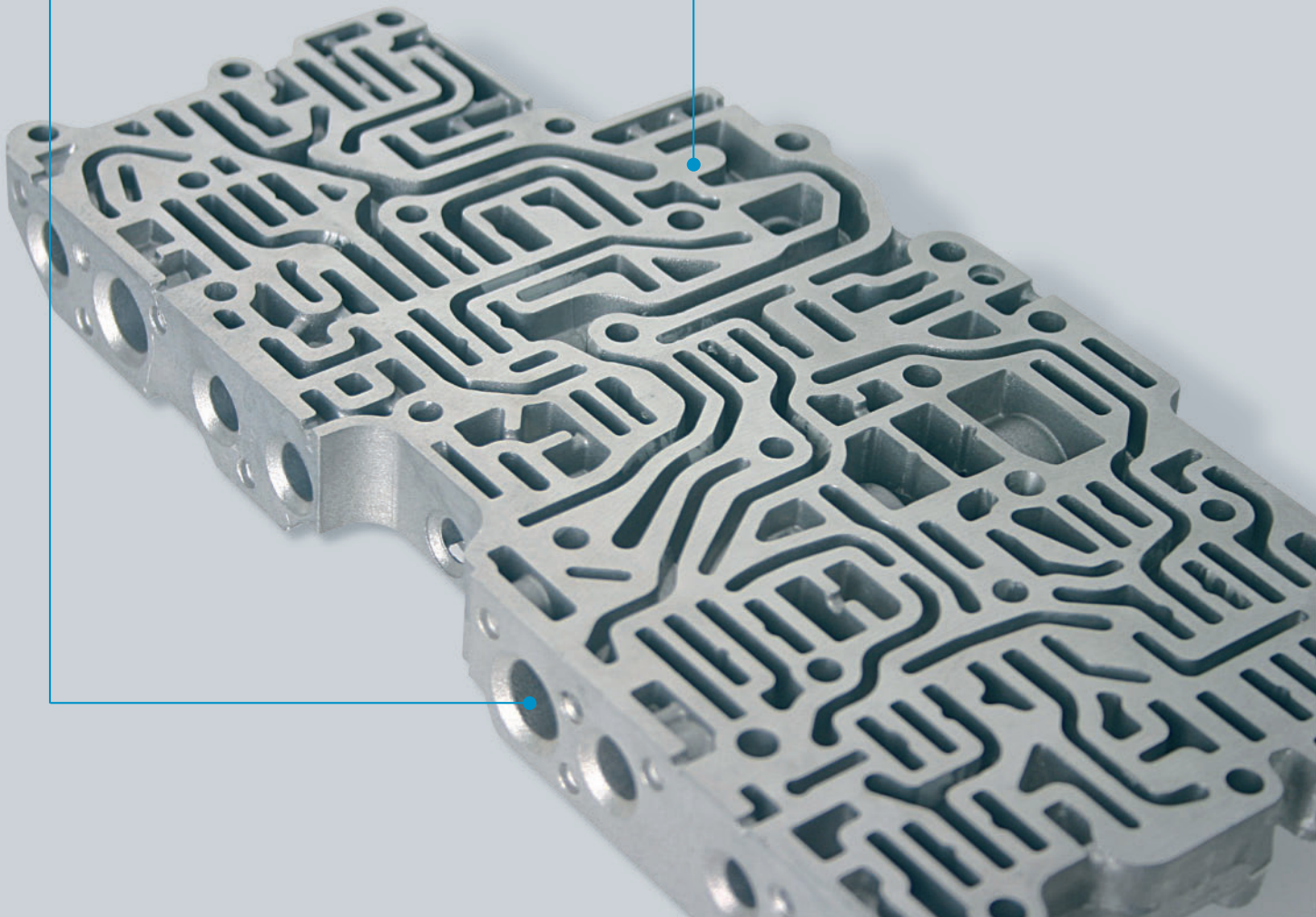


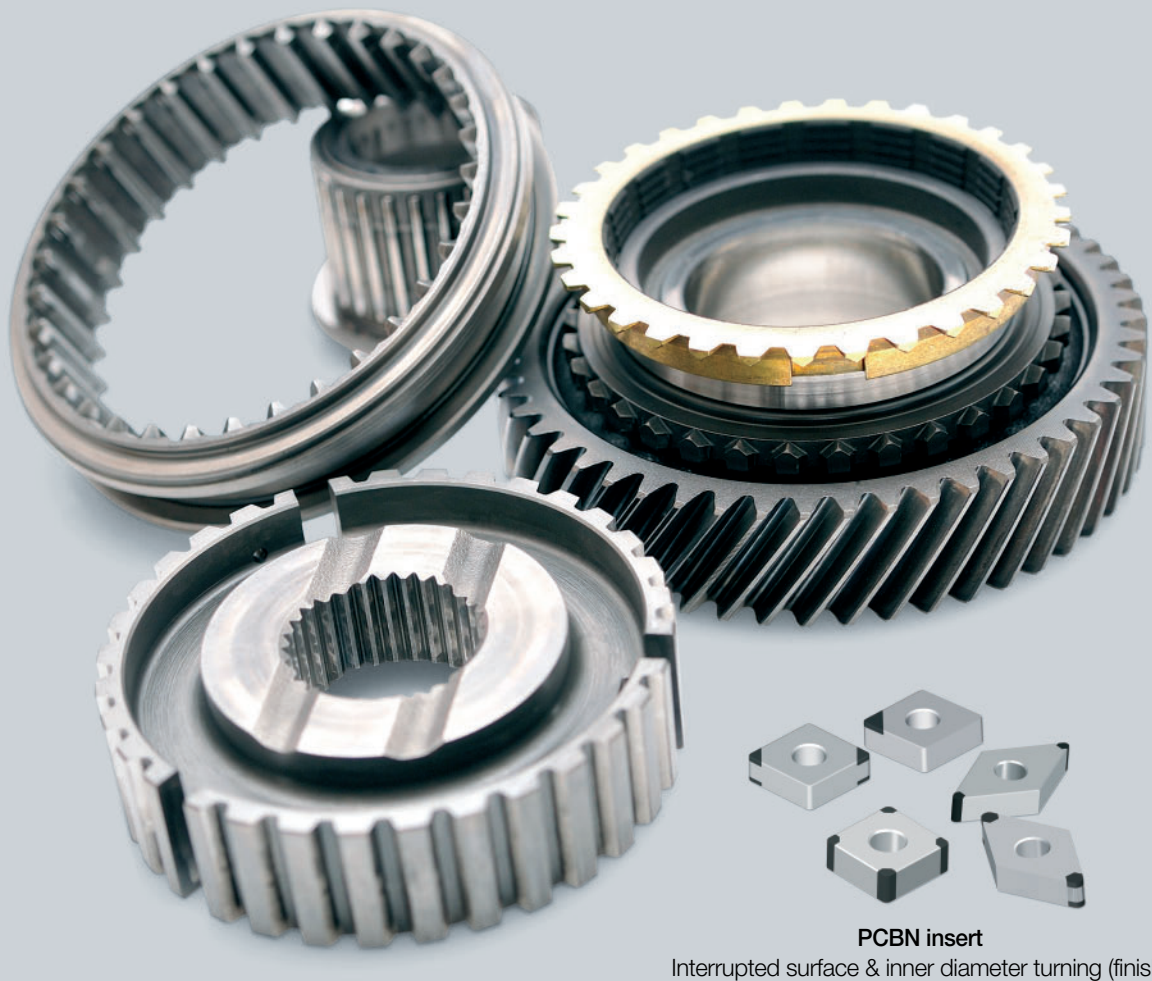
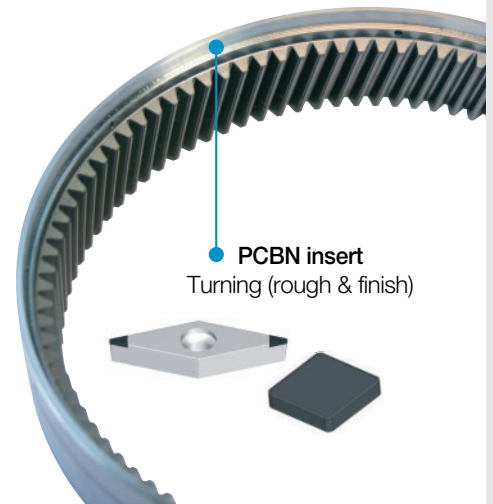
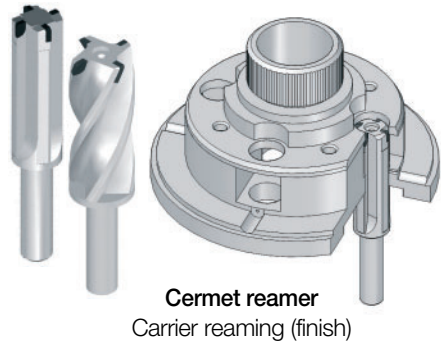
Automotive Valve bodies (Al alloy)

PCD insert & reamer
Reaming (rough & finish)

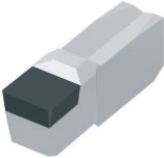


PCD milling cutter
Top face milling (rough & finish)

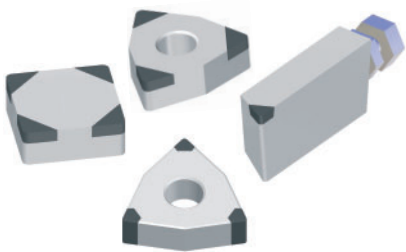




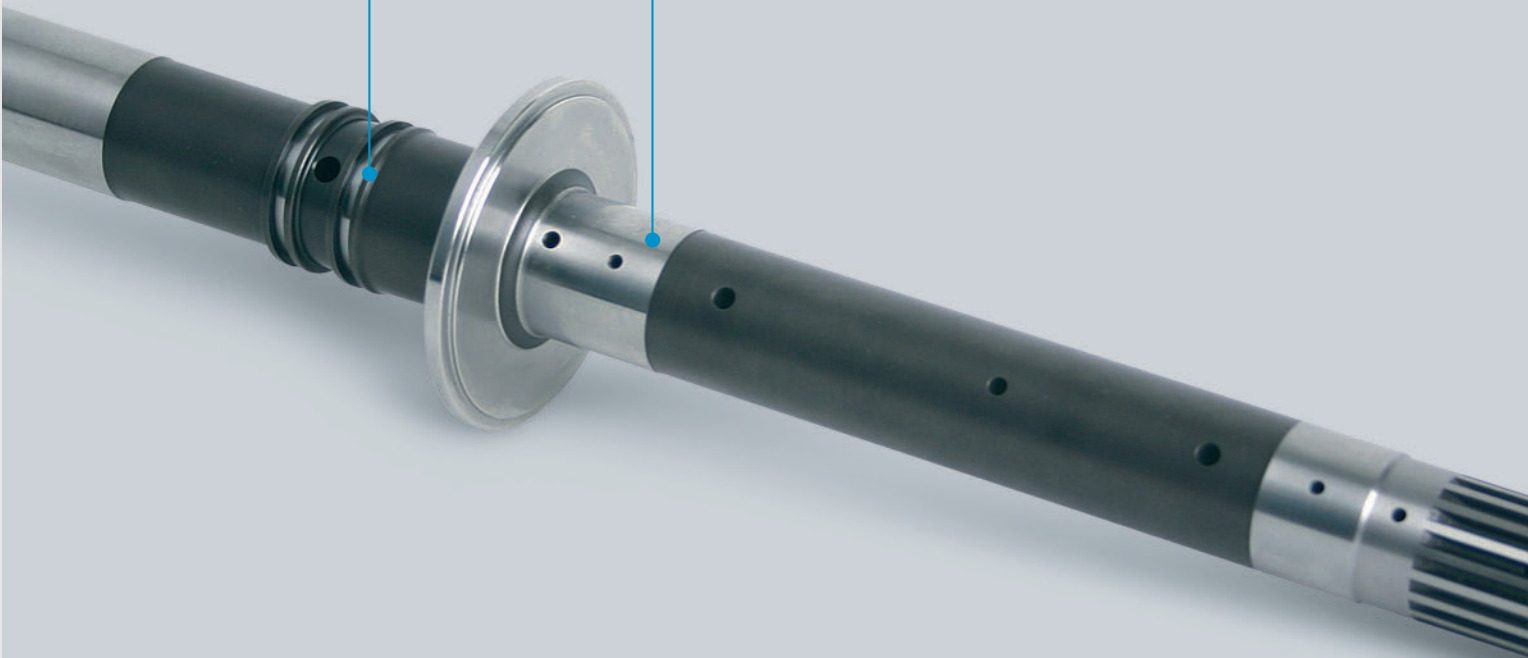
Automotive Transmission shaft



PCBN tool
Grooving (finish)

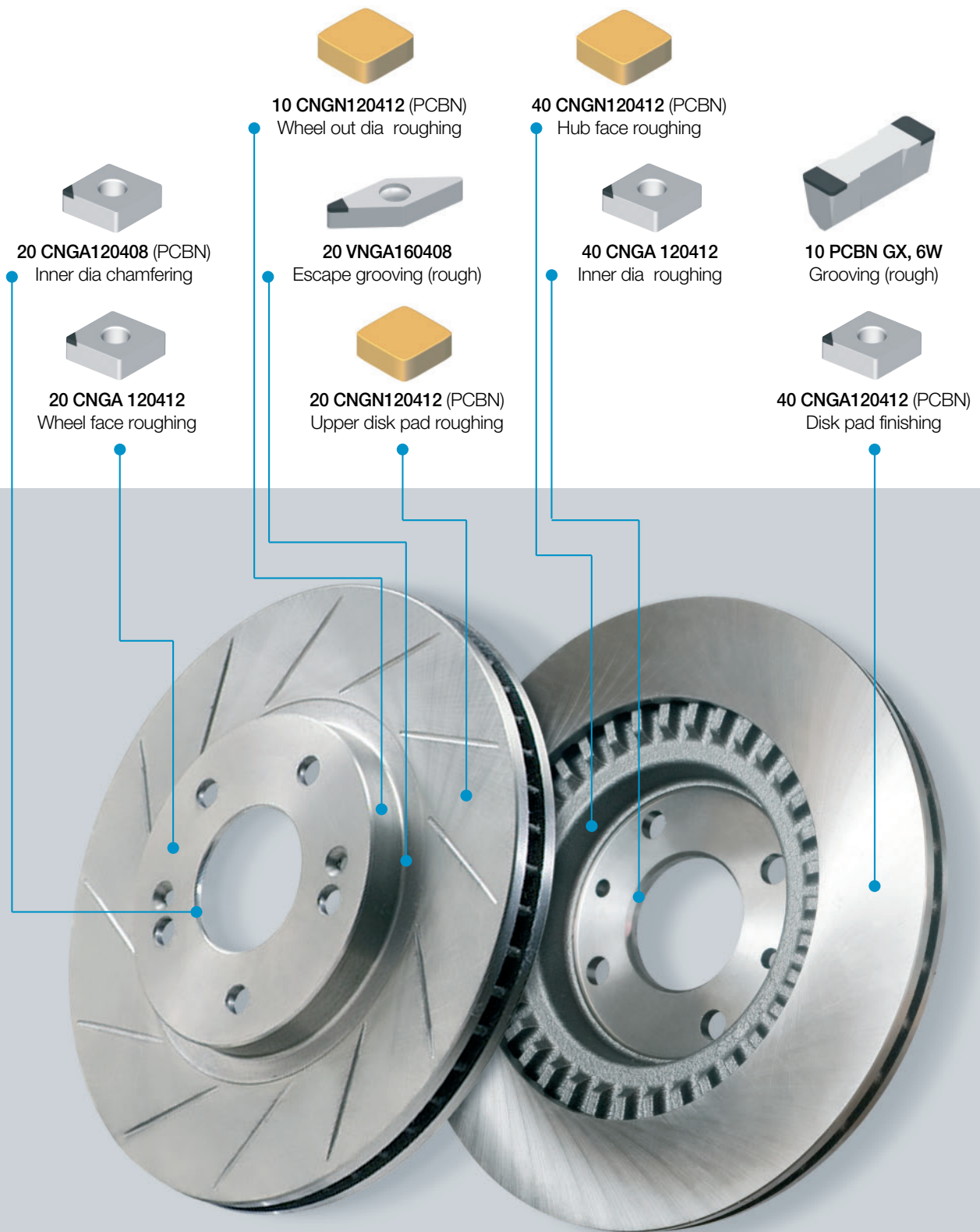


PCBN insert & tool
Main shaft turning (finish)

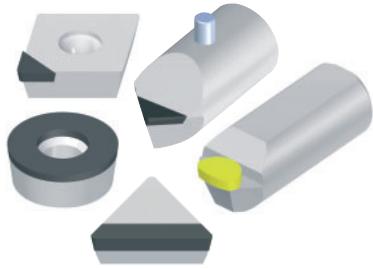


Applications

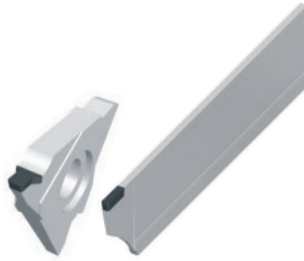
Automotive Brake disc



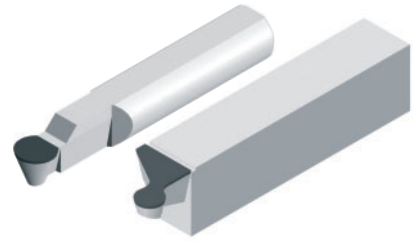
Automotive Piston



PCD, MONO insert & tool
Turning



PCD grooving tool
Ring grooving



PCD special tool
Combustion bowl cutting

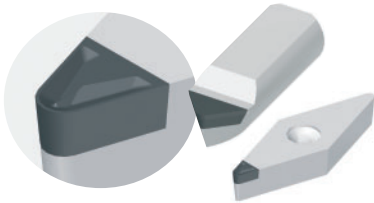


PCD reamer
Pin boring & chamfering



PCD cutter
Circlip & R boss cutting

Automotive Compressor piston & housing



PCD boring tool (chip breaker)
Piston O.D turning



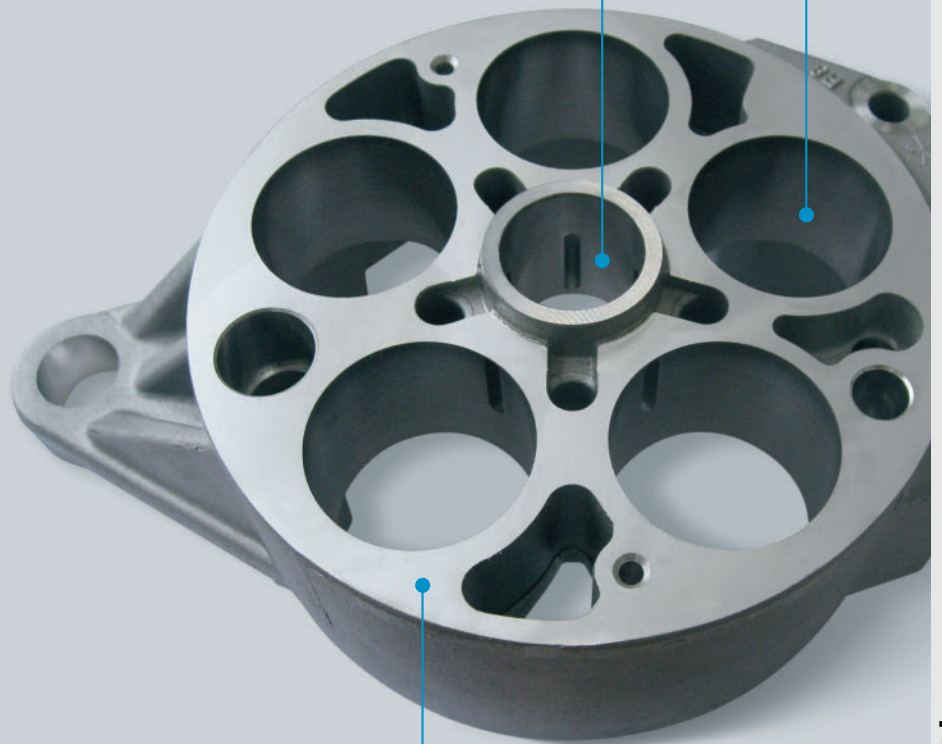
PCD endmill
Piston ball seat
chamfer cutting



PCD ball endmill
Piston ball seat cutting



PCD reamer & blade
Piston bore & shaft bore reaming



PCD double cutter
Piston side cutting



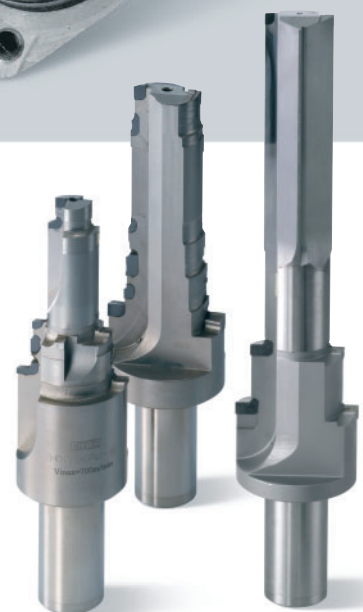
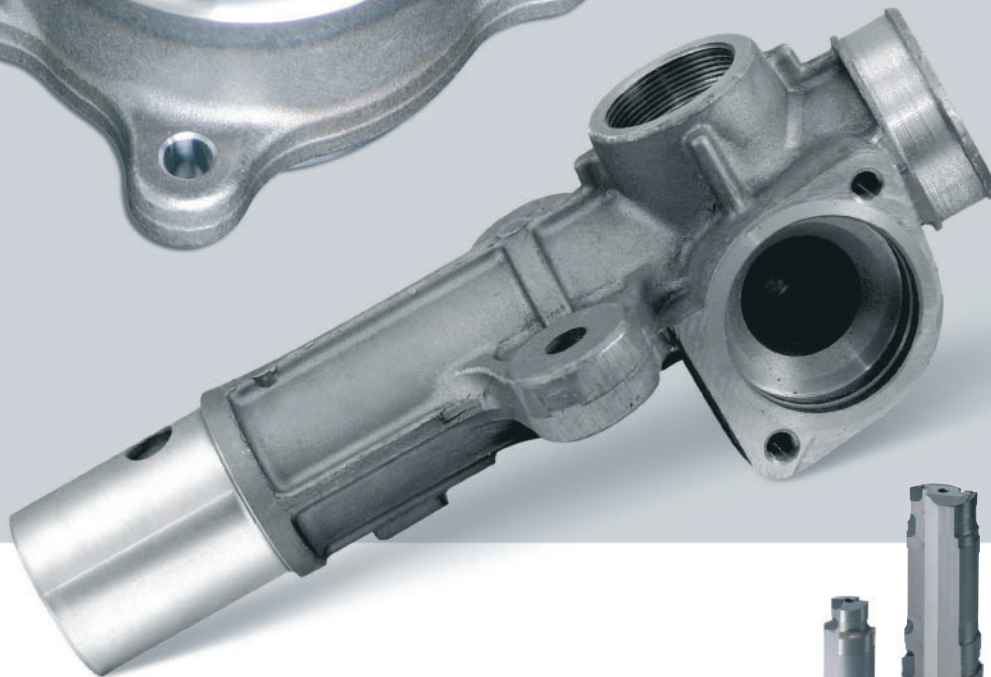
PCD milling cutter
Piston housing face milling

Applications

Automotive Steering box, Bearing

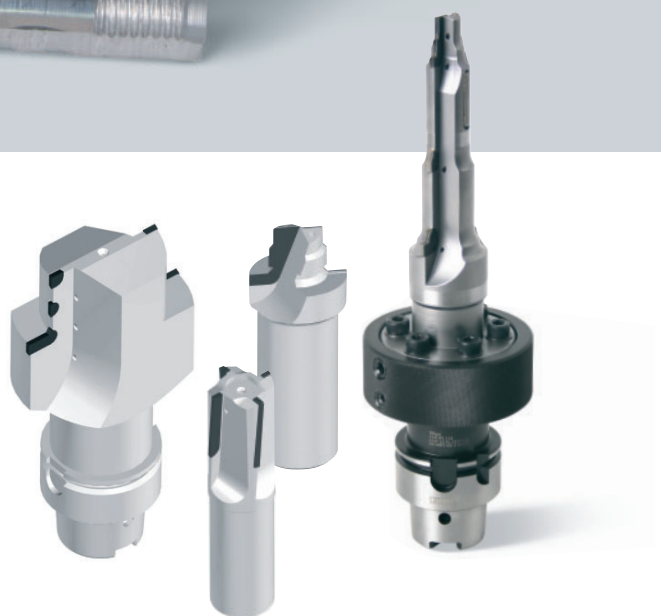


PCBN insert
Outer race turning

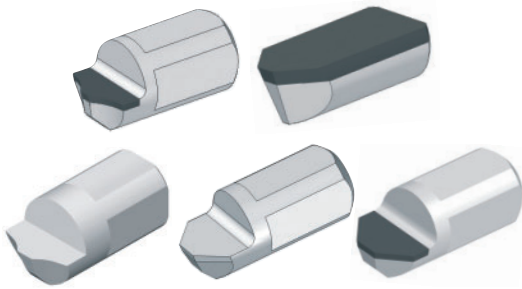


PCD step reamer
Steering box reaming

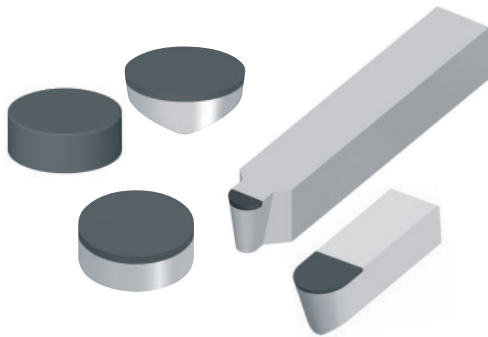
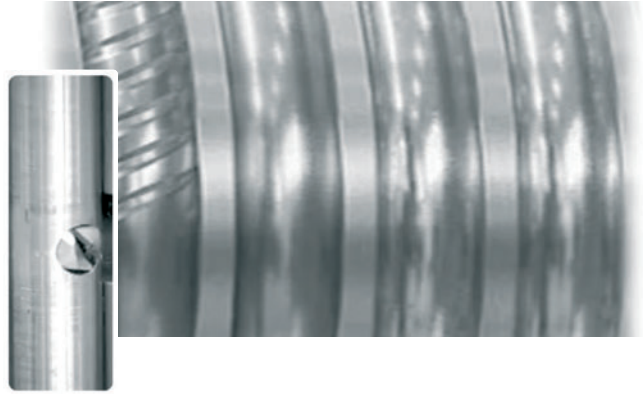
Automotive Pump housing



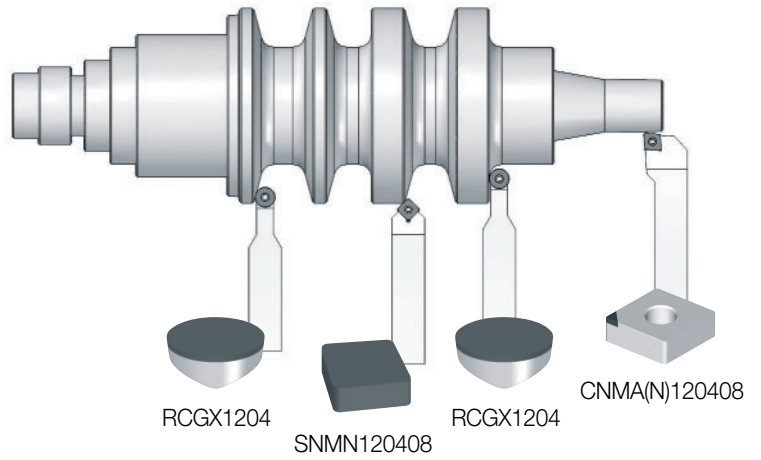
PCD step reamer, endmill
Pump housing cutting



Notch tool
(PCD, PCBN, TC)



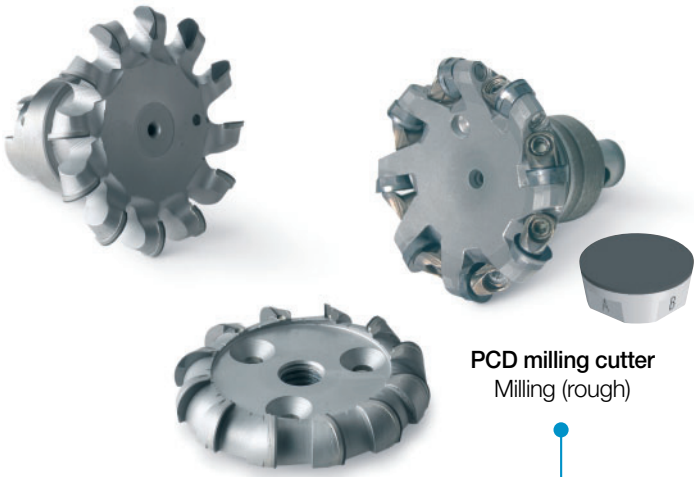
Grooving & Turning
(PCD, PCBN, TC, Ceramic)



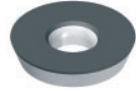
Engraving
(PCD, TC)



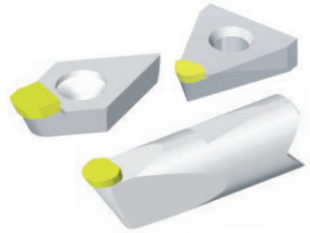
Ophthalmic lens



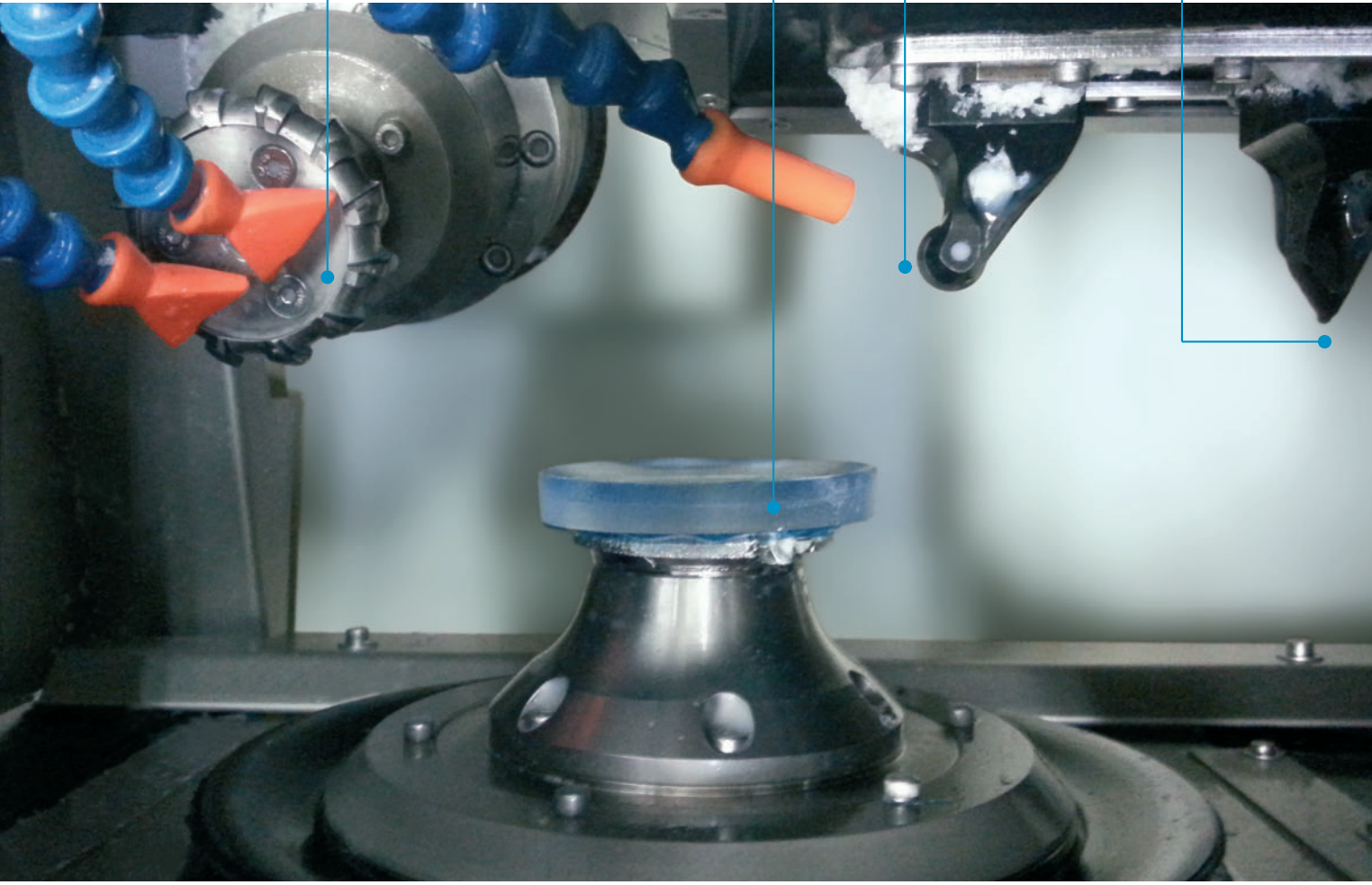
MONO insert
Out diameter Turning



PCD insert
Turning (semi-finish)

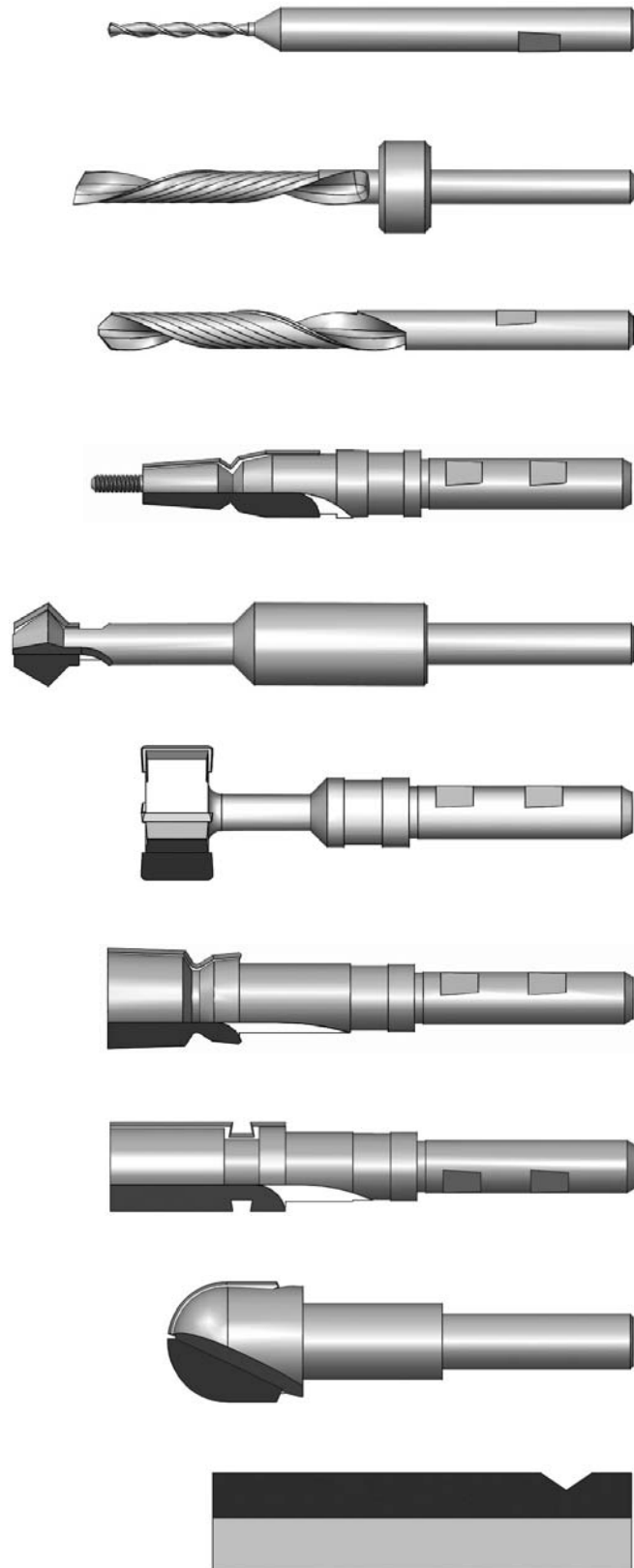


MONO insert
Turning (finish)



Applications

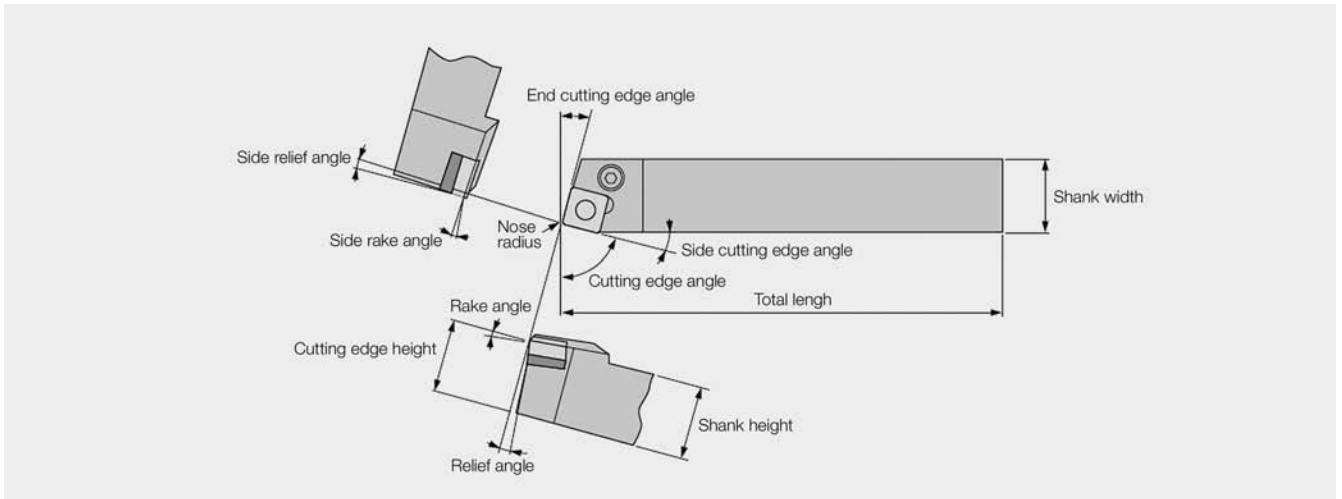
Edge machining



Technical information

Turning

Insert shape and terminology



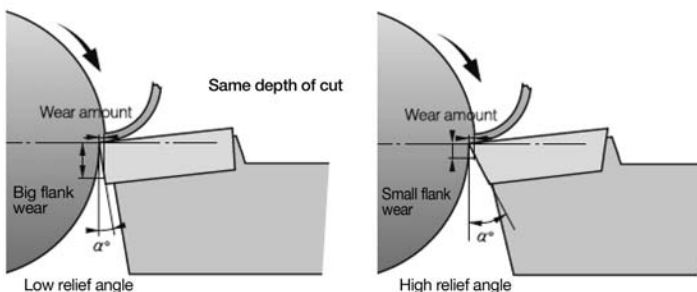
Relating angles between tool and workpiece

| Cutting edge inclination | Terminology | Function | Effects |
|--------------------------|-----------------------------------|---|---|
| Rake angle | Side rake angle Rake angle | Cutting force, Cutting heat, The effects of chip control on tool life | <ul style="list-style-type: none"> ⊕ Excellent machine-ability (reducing cutting force, weakening cutting edge strength) ⊕ When machining excellent machineability or thin workpiece. ⊖ When strong cutting edge is needed at interrupted condition or mill scale. |
| Relief angle | Relief angle Side relief angle | Only cutting edge contact with cutting face | <ul style="list-style-type: none"> ⊖ Cutting edge is strong but has short tool life to make bad influence on flank wear. |
| Cutting edge angle | Cutting edge angle | Effects chip control and cutting force direction | <ul style="list-style-type: none"> ⊕ Improved chip control because chip thickness is big. |
| | Side cutting edge angle | Effects chip control and cutting force direction | <ul style="list-style-type: none"> ⊕ Strong cutting edge due to distributed cutting force but chip control is bad by thin chip thickness ⊖ Improved chip performance. |
| | End cutting edge angle | Prevent friction between cutting edge and cutting face | <ul style="list-style-type: none"> ⊖ Cutting edge is strong but has short tool life to make bad influence on flank wear. |

Relief angle

Relief angle avoids the friction between workpiece and relief face and makes cutting edge move along workpiece easily.

Relationship between various relief angle and flank wear



Effects

- If relief angle is big, Flank wear decreases.
- If relief angle is big, Cutting edge strength weakens.
- If relief angle is small, Chattering occurs .

Selection system

- Hard workpiece / When strong cutting edge is needed - Low relief angle
- Soft workpiece / Workpiece turning to work hardening easily - High relief angle

End cutting edge angle

It Effects machined surface to prevent interference between surface of workpiece and insert.

End cutting edge angle



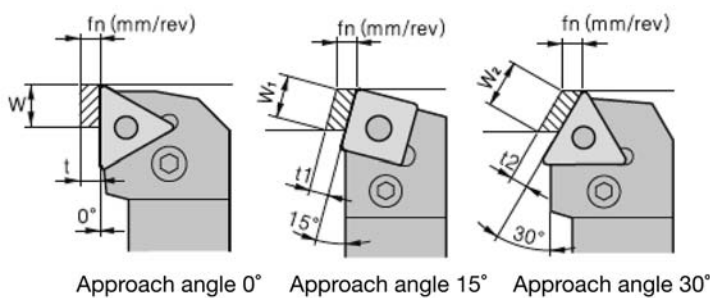
Effects

- If end cutting edge angle reduces cutting edge get stronger but cutting heat generated by machining increases.
- Small end cutting edge angle can cause chattering due to the increases cutting force.

Side cutting edge angle

Side cutting edge angle has big influence on chip flow and cutting force therefore proper Side cutting edge angle is very important.

Side cutting edge angle and Chip thickness



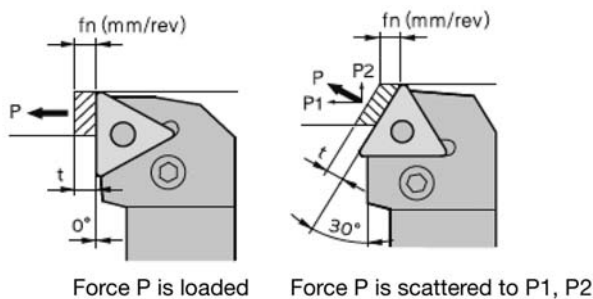
As side cutting edge angle is getting bigger chips are getting thinner and wider(refer to left picture). At the same feed and depth of cut with approach angle 0°.

Chip thickness is the same as feed ($t=fn$) and chip width is equal to depth of cut ($W=ap$).

$$t_1 = 0.97t, W_1 = 1.04W$$

$$t_2 = 0.87t, W_2 = 1.15W$$

Side cutting edge angle and Cutting load



As approach angle gets bigger Back force gets bigger and feed force gets smaller.

Side cutting edge angle and Cutting performance

| | | | | |
|-------------------------|-------|--------------------|-------|---------------------------|
| low | ← ← ← | Lead angle | → → → | High |
| High | ← ← ← | Wear rate | → → → | Low |
| Easy to cut material | ← ← ← | Workpiece | → → → | Difficult to cut material |
| Small | ← ← ← | Machining power | → → → | Big |
| Hard to occur | ← ← ← | Chatter | → → → | Easy to occur |
| Finishing | ← ← ← | How to machine | → → → | Roughing |
| Long thin workpiece | ← ← ← | Workpiece rigidity | → → → | Thick workpiece |
| In case of low rigidity | ← ← ← | Machine rigidity | → → → | In case of high rigidity |

Turning

Nose-R

Nose-R Effects not only surface roughness but strength of cutting edge. In general, It's desirable that Nose-R is 2~3 times bigger than feed.

Effects of Nose-R

- Big Nose-R improves surface finish.
- Big Nose-R improves cutting edge strength.
- Big Nose-R reduces flank wear and crater wear.
- Too big Nose-R causes chattering due to increased cutting force.

Selection system

- For finishing with small depth of cut / long and thin workpiece / When machine power is low - Small Nose-R
- For applications that need strong cutting edge such as intermittent and machining mill scale / For roughing of big work piece / When the machine power is strong enough - Big Nose-R

Cutting edge shape and the affects

Rake angle

Rake angle has big influence on cutting force, chip flow and tool life.

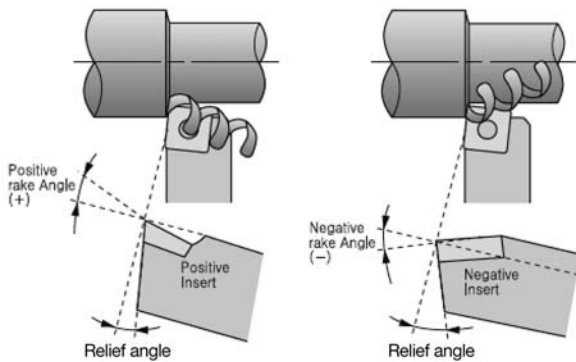
Effects of Nose-R

- High rake angle results in good surface finish.
- As the rake angle increases by 1° Machining power decreases by 1%.
- High rake angle weakens cutting edge.

Selection system

- For hard workpiece / For applications that need strong cutting edge such as interrupted and machining mill scale - Low rake angle
- For soft workpiece / Easy to cut material / When the rigidity of machine power and workpiece is low - High rake angle

Rake angle and the direction of chip flow

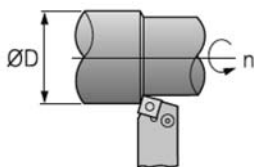


Major cutting formulas

Cutting Speed

$$V_c = \frac{\pi \times D \times N}{1,000} \text{ (m/min)}$$

- V_c : Cutting speed (m/min)
- D : Diameter (mm)
- N : Revolution per minute (min^{-1})
- π : Circular constant (3.14)



Feed

$$f_n = \frac{V_f}{N} \text{ (mm/rev)}$$

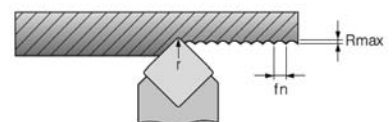
- f_n : Feed per revolution (mm/rev)
- v_f : Table feed (mm/min)
- N : Revolution per minute (min^{-1})

Theoretical surface roughness

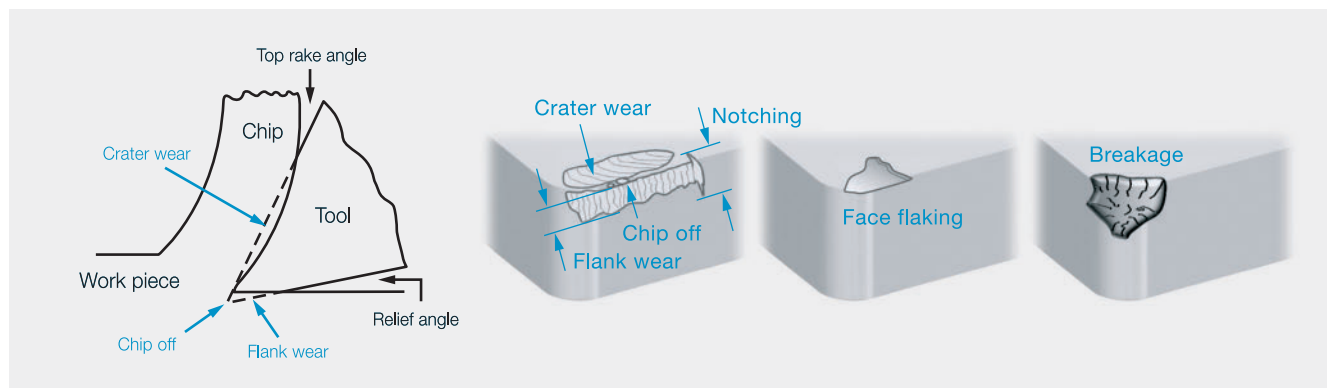
$$R_{\text{max}} = \frac{f_n^2}{8r} \times 1,000$$

Practical surface roughness

- Steel : $R_{\text{max}} \times (1.5\sim3)$
- Cast iron : $R_{\text{max}} \times (3\sim5)$
- R_{max} : Profile depth (μm) (Maximum height roughness)
- f_n : feed (mm/rev)
- r : nose radius



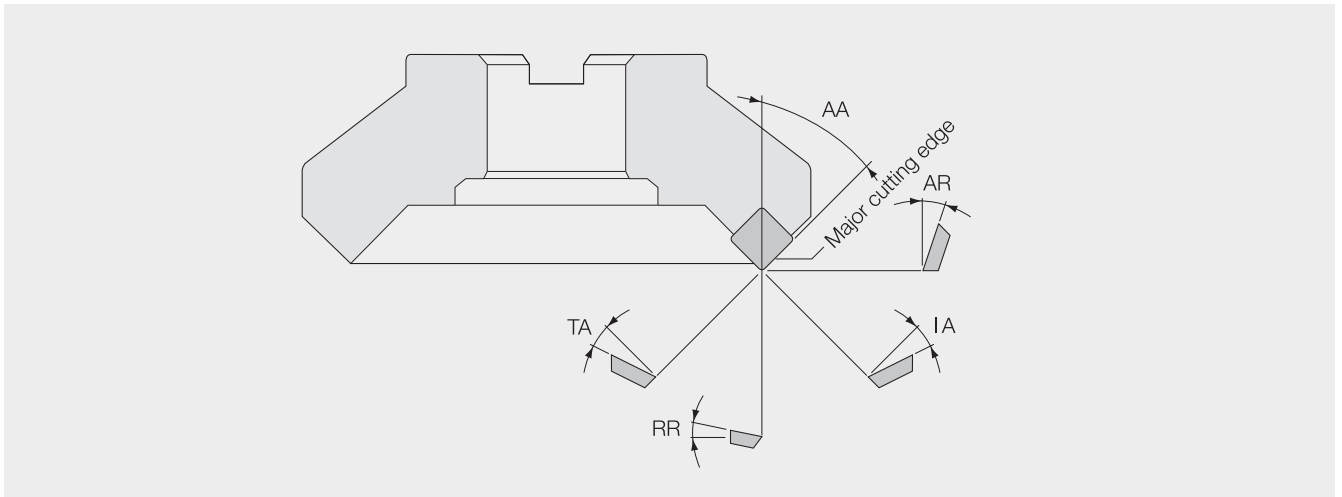
Wear behavior



Trouble shooting by wear behavior

| Wear type | Trouble shooting |
|------------------------------|---|
| Crater wear | <ul style="list-style-type: none"> • Reduce cutting speed • Reduce feed rate • Reduce chamfer angle • Use coated insert & coolant |
| Flank wear | <ul style="list-style-type: none"> • Increase cutting speed (Grey cast iron) • Reduce cutting speed (Hardened steel) • Increase feed rate • Increase depth of cut • Check tool center height |
| Notch wear | <ul style="list-style-type: none"> • Increase cutting speed • Reduce feed rate • Increase approach angle • Use chamfered edge preparation • Change D.O.C |
| Chipping | <ul style="list-style-type: none"> • Use chamfered or horned edge preparation • Increase system rigidity • Change cutting speed to eliminate vibration |
| Face flaking Continuous cut | <ul style="list-style-type: none"> • Increase cutting speed • Reduce feed rate • Use chamfered and horned edge • Reduce insert approach angle • Check tool center height |
| Face flaking Interrupted cut | <ul style="list-style-type: none"> • Use dry cutting • Reduce feed rate • Use chamfered and horned edge • Reduce insert approach angle • Check cutting tool center height |
| Breakage | <ul style="list-style-type: none"> • Increase cutting speed • Reduce feed rate • Increase approach angle • Use chamfered edge preparation |

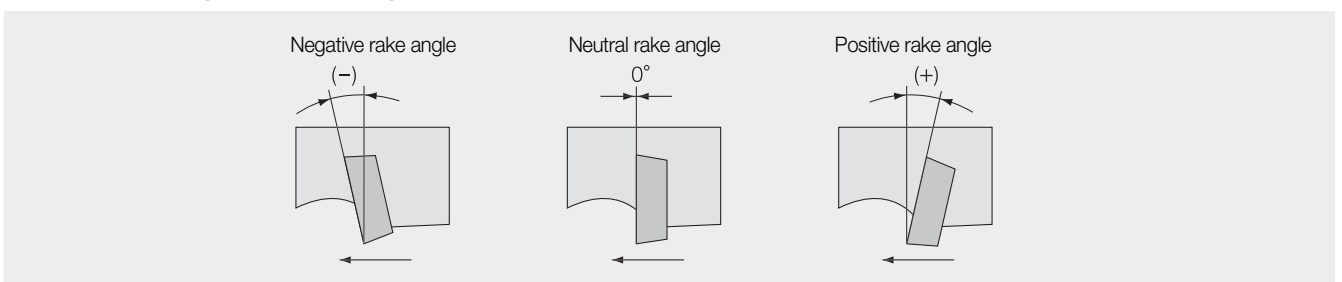
Milling cutter shape and designation



The terminology and functions of cutting edge angle

| Tool failure | Symbol | Function | Effects |
|--------------------------------|--------|---|---|
| Axial rake angle | A.R | Chip flow direction, Adhesion | – |
| Radial rake angle | R.R | Affecting on thrust | – |
| Approach angle | A.A | Chip thickness, Determines flow direction | ⊕ Chip thickness become thinner, cutting force could be reduced |
| True rake angle | T.A | Effective rake angle | ⊕ Better cutting, preventing adhesion, weakening cutting edge strength ⊖ Cutting edge strength increases, easy to adhere |
| Cutting edge inclination angle | I.A | Determines chip flow direction | ⊕ Good chip flow, cutting force decreases, Corner edge strength weakens |
| Face angle | F.A | Controlling surface roughness for finishing | ⊖ Surface roughness improves |
| Relief angle | R.A | Controlling cutting edge strength, tool life and chattering | – |

Positive and Negative Rake angle

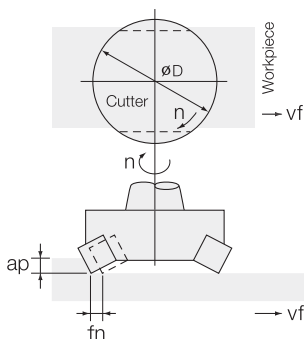


- Insert shape whose cutting edge precedes is a positive rake angle (+)
- Insert shape whose cutting edge follows is a negative rake angle (-)

Features by combination of rake angle

| | Double positive angle | Double negative angle | Posi - Negative angle | Nega - Positive angle |
|---------------|---|--|--|--|
| | | | | |
| Use | <ul style="list-style-type: none"> • General machining of steel, cast iron, stainless steel • Machining soft steel that brings about built-up edge easily • Machining material having tendency to poor surface roughness | <ul style="list-style-type: none"> • Under interrupted cutting condition • Roughing of cast iron and steel | <ul style="list-style-type: none"> • Machining difficult to cut material • Roughing with deep depth of cut and wide width of cut in steel and cast iron | <ul style="list-style-type: none"> • Chip flows to center of cutter body |
| Advantages | <ul style="list-style-type: none"> • As for tough workpiece material It prevents built-up edge to improve surface roughness • Low cutting load and better machinability | <ul style="list-style-type: none"> • Strong cutting edge • Roughing of workpiece that has bad surface condition containing sand, mill scale • Double sided inserts can be applied (Economical) • Good chip control | <ul style="list-style-type: none"> • Good chip flow and machinability. • Suitable for machining of difficult-to-cut material • Un-even partition clamping prevents chattering | — |
| Disadvantages | <ul style="list-style-type: none"> • Weak cutting edge strength • Only single sided inserts are available (No economical) • Machine and cutter need enough power and rigidity | <ul style="list-style-type: none"> • Machine and cutter need enough power and rigidity | <ul style="list-style-type: none"> • Only single sided inserts are available (No economical) | <ul style="list-style-type: none"> • Since the chips flows toward the center of cutter. Chips scratch on machined surface • Bad chip flow • No economical |

Major cutting formulas



Cutting Speed

$$V_c = \frac{\pi \times D \times N}{1,000} \text{ (m/min)}$$

- V_c : Cutting speed (m/min)
- D : Diameter of tool (mm)
- N : Revolution per minute (min^{-1})
- π : Circular constant (3.14)

Feed

$$f_z = \frac{v_f}{N \times z} \text{ (mm/tooth)}$$

- f_z : Feed per tooth (mm/tooth)
- v_f : Feed per minute (mm/min)
- N : Revolution per minute (min^{-1})
- z : Number of tooth

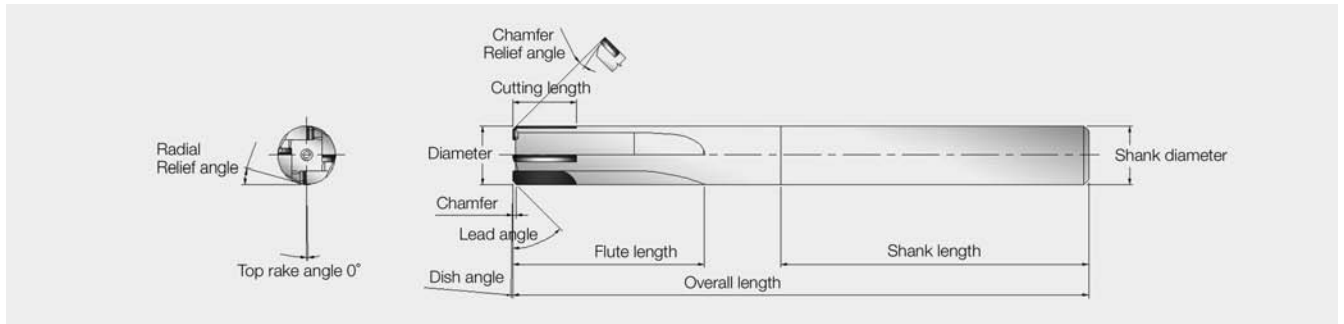
Machining time

$$T = \frac{60 \times L_t}{v_f} \text{ (sec)}$$

- T : Machining time (sec)
- L_t : Total length of table feed (mm) ($=L_w + D + 2R$)
- L_w : The length of workpiece (mm)
- D : Diameter of cutter body (mm)
- v_f : Table feed (mm/min)
- R : Relief length (mm)

Endmill

Endmill's shape and names



The comparison according to number of flute

Features of number of flute

| Flute | 2 flutes | 3 flutes | 4 flutes |
|---------------|-----------------------------|-----------------|--------------------------------|
| Shape | | | |
| Chip flow | Good | ← ← ← | Bad |
| Tool rigidity | Weak | → → → | High |
| Purpose | hole, side, General purpose | Side, Finishing | Hard material, Side, finishing |

Effect of number of flute

| Specification | Major features | 2 flutes | 4 flutes |
|----------------|---------------------|----------|----------|
| Tool rigidity | Torsional rigidity | ○ | ⊗ |
| | Bending rigidity | ○ | ⊗ |
| Surface finish | Surface roughness | ○ | ⊗ |
| | Machining precision | ○ | ⊗ |
| Chip control | Chip clogging | ⊗ | ○ |
| | Chip evacuation | ⊗ | ○ |
| Grooving | Chip evacuation | ⊗ | ○ |
| | Grooving | ⊗ | ○ |
| Side facing | Surface finish | ○ | ⊗ |
| | Vibration | ⊗ | ○ |

○ Good ⊗ Excellent

Calculations of cutting condition

Calculations of Cutting speed

$$V_c = \frac{\pi \times D \times N}{1,000} \text{ (m/min)}$$

- V_c : Cutting speed (m/min)
- π : Circular constant (3.14)
- D : Endmill diameter (mm)
- N : Revolution per minute (min^{-1})

Calculations of feed speed

$$f_z = \frac{V_f}{N \times Z} = \frac{f_n}{Z} \text{ (mm/tooth)}$$

$$V_f = N \times f_z \times Z = N \times f_n \text{ (m/min)}$$

$$f_n = \frac{V_f}{N} = f_z \times Z \text{ (mm/rev)}$$

- V_f : Feed speed (m/min)
- f_n : Feed per revolution (mm/rev)
- f_z : Feed per tooth (mm/tooth)
- Z : Number of flute

The effect of flute length

Expression of aspect ratio

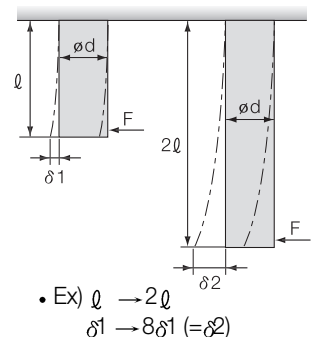
- Aspect ratio
- l/d
- Ex) 3d, 5d, 10d

Deformation rate according to length

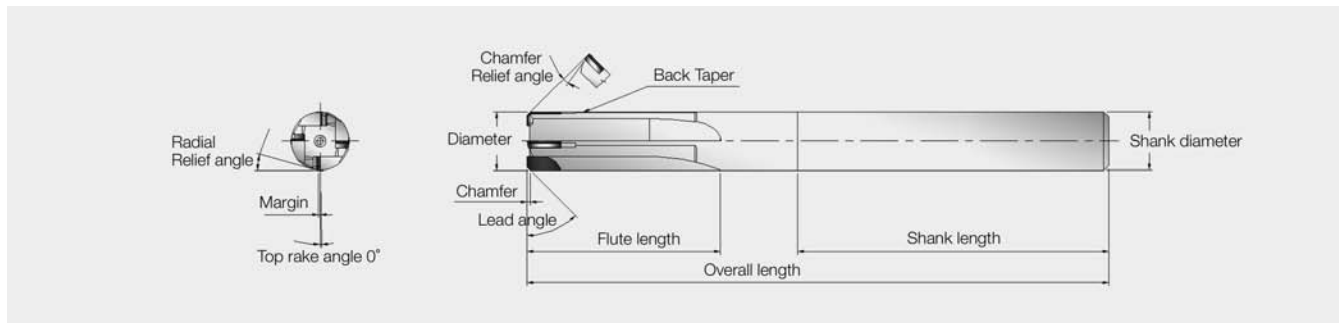
- Deformation rate is reaction force against external force
- Proportional to the cube of length
- Set flute length and overall length as short as possible
- The more flute the better rigidity
- When flute width rate is narrower drill's rigidity is higher

$$\delta = \frac{P l^3}{3EI} \quad l = \frac{\pi d^4}{64}$$

- δ : Deformation volume
- P : Cutting force
- l : Length of cut
- E : Elasticity coefficient
- I : Inertia moment



Reamer's shape and names

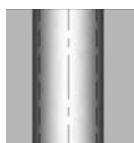


Shape and the feature of cutting

| | |
|----------------------------|---|
| <p>Margin</p> | <p>A cylindrical part of the outer diameter (serve as a guide for dimensional accuracy, and proper burnishing action)</p> <ul style="list-style-type: none"> • Cutting resistance decrease • Heat generation is low • Roughness and Guide are bad <p style="text-align: center;">low ← Margin → high</p> <ul style="list-style-type: none"> • Cutting resistance increase • Heat generation is high • Roughness and Guide are good |
| <p>Lead angle</p> | <p>Cutting corners to perform work</p> <ul style="list-style-type: none"> • Staightness is good • Roughness and Guide are bad • Chip thickness is thick <p style="text-align: center;">low ← Lead angle → high</p> <ul style="list-style-type: none"> • Staightness is bad • Roughness and Guide are good • Chip thickness is thin |
| <p>Back taper</p> | <p>Smaller in diameter towards shank for less friction between the hole wall.</p> <ul style="list-style-type: none"> • Machinability is bad • Roughness is good • Resharpening is plenty <p style="text-align: center;">low ← Back taper → high</p> <ul style="list-style-type: none"> • Machinability is good • Roughness is bad • Resharpening is less |
| <p>Relief angle</p> | <p>Relief angle avoids the friction between workpiece and relief face and makes cutting edge move along workpiece easily.</p> <ul style="list-style-type: none"> • Edge sharpness decrease • Edge strength increase • Hard workpiece <p style="text-align: center;">low ← Relief angle → high</p> <ul style="list-style-type: none"> • Edge sharpness increase • Edge strength decrease • Soft material |

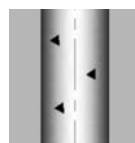
Trouble shooting

Too large diameter



- Tool diameter may be too large
- Cutting speed too high
- Feed too high
- Run-out error too high
- Cutting lead uneven
- Coolant unsuitable

Bad surface



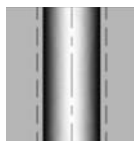
- Coolant unsuitable
- Build-up on cutting edge
- Tool blunt-possible fracturing on blade
- Chip removal bad
- Residual imbalance too large

Deformed hole



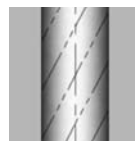
- Workpiece not correctly clamped

Too small diameter



- Tool worn
- Cutting speed too low
- Feed too low
- Ductile material - contracts after machining
- Allowance insufficient

Chatter marks



- Build-up on cutting edge
- Tool blunt
- Coolant unsuitable
- Run-out error too high
- Residual imbalance too great
- Clamping set-up not correct

Curved hole



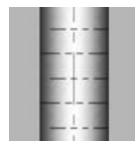
- Wrong lead geometry
- Wrong axial position of blade

Tapered hole



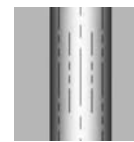
- Run-out error too high
- Cutting lead not correct
- Pre-machining not correct

Feed grooves



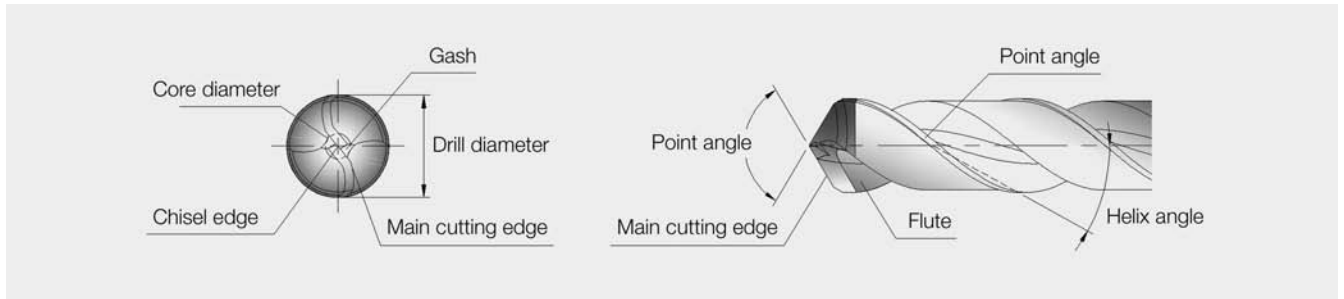
- Tool blunt, possible fracturing on blade
- Build-up on cutting edge
- Coolant unsuitable

Facets



- Centering error
- Too small back taper



Drill's shape and names



Shape and the feature of cutting

| | | | | | | |
|------------------------|---|--|-------|---------------------|--------|---|
| Point angle | Point angle has big influence on cutting performance. It mainly depends on workpiece. In case of standard drills Point angle is generally 118°. | <ul style="list-style-type: none"> • Thrust resistance decrease • Torque increase, Burr on exit increase • Soft material (aluminum etc) | low ← | Point angle | → high | <ul style="list-style-type: none"> • Thrust resistance increase • Torque decrease, Burr on exit decrease • Hard workpiece (hardened steel) |
| Helix angle | Plays rake angle of cutting edge's role. If helix angle increases Cutting force decreases. On the other hand If helix angle is too big Drill rigidity decreases. | <ul style="list-style-type: none"> • Poor machinability • Hard workpiece (hardened steel) | low ← | Helix angle | → high | <ul style="list-style-type: none"> • Smooth chip evacuation • Soft material (aluminum etc) |
| Flute | The path of both chip evacuation and cooling lubricant. Too big length of flute weakens drill rigidity and too small length of flute worsens chip evacuation to breakage. | | | | | |
| Relief angle | Relief angle avoids the friction between workpiece and relief face and makes cutting edge move along workpiece easily. | <ul style="list-style-type: none"> • Edge sharpness decrease • Edge strength increase • Hard workpiece | low ← | Relief angle | → high | <ul style="list-style-type: none"> • Edge sharpness increase • Edge strength decrease • Soft material |
| Gash (Thinning) | In general drills Thrust effects on chisel over 50%. Chisel edge length depends on web thickness and chisel angle. But if web is thin Drill rigidity weaken. Therefore without web thickness change Thinning makes chisel edge short or gives rake angle. In other words, Thinning makes rake angle at chisel and improves chip evacuation and decrease thrust. | | | | | |

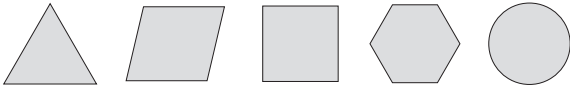
Helical and Burnishing type comparison

| | Helical Drill | Burnishing Drll |
|--------------------|---|--|
| |  |  |
| Cutting Resistance | Good (small) | Bad (big) |
| Roughness | Bad | Good |
| Chip evacuation | Good | Bad |
| Heat Generation | Good (small) | Bad (big) |
| Usage | Deep hole, steel etc. | Al, non-ferrous, Cutting small material |

Major cutting formulas

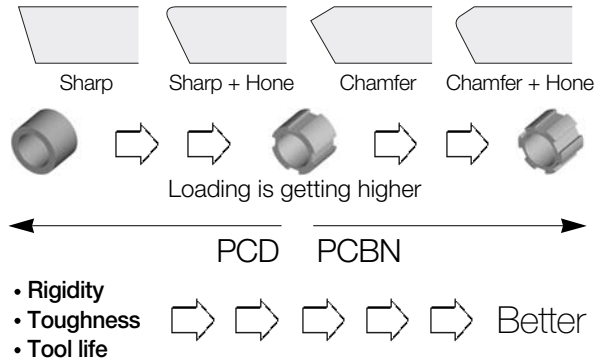
| Cutting Speed | Feed | Machining time |
|--|---|--|
| $V_c = \frac{\pi \times D \times N}{1,000} \text{ (m/min)}$ | $f_n = \frac{V_f}{N} \text{ (mm/rev)}$ | $T = \frac{L}{N \times f_n} \text{ (min)}$ |
| <ul style="list-style-type: none"> • V_c : Cutting speed (m/min) • D : Diameter (mm) • N : Revolution per minute (min^{-1}) • π : Circular constant (3.14) | <ul style="list-style-type: none"> • f_n : Feed per revolution(mm/rev) • v_f : Table feed (mm/min) • N : Revolution per minute (min^{-1}) | <ul style="list-style-type: none"> • T : Machining time (min) • n : Revolution per minute (min^{-1}) • L : Length of drilling (mm) • f_n : Feed (mm/rev) |

Shape of tools



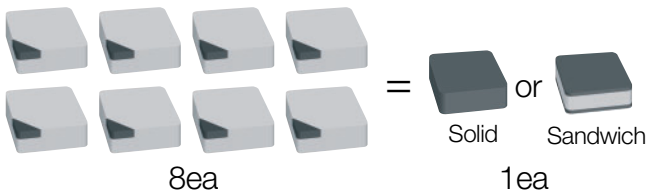
- Loading & Vibration → → → → → Higher
- Rigidity → → → → → Better
- Toughness → → → → → Better
- Tool life → → → → → Better

Edge preparation



Benefits of solid PCBN & Sandwich PCBN

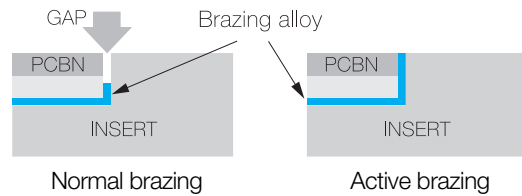
For cast iron machining



Benefits

- No brazing joint, Full cutting edge available
- High rigidity, Multiple corner available
- Cost reduction, Eco friendly

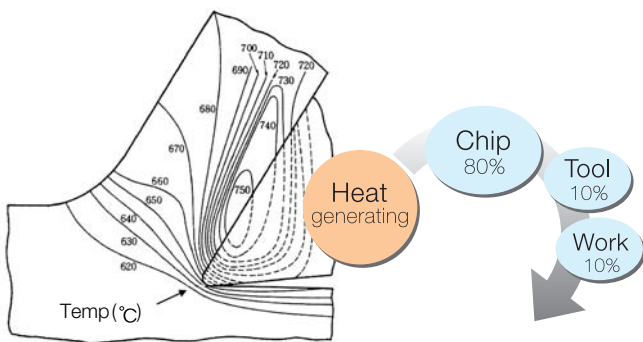
Benefits of active brazing



Benefits

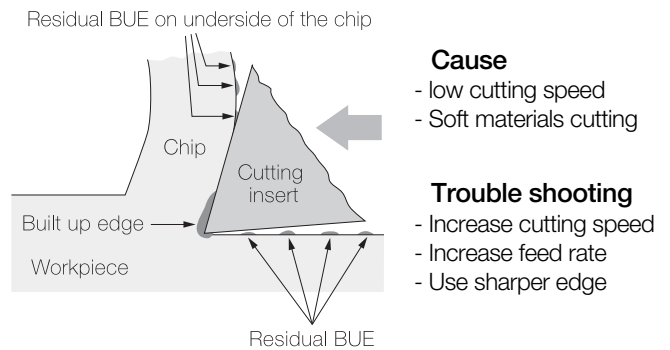
- No oxidation due to vacuum condition
- Less GAP between PCD/PCBN blank and T.C insert → More Rigidity
- Higher brazing strength

Heat generation of machining



- Poor Rigidity
 - Faster wear out
 - Deformation by heating
- → → Poor tool life
Reduce precision

Built-up edge (BUE)



Cause

- low cutting speed
- Soft materials cutting

Trouble shooting

- Increase cutting speed
- Increase feed rate
- Use sharper edge

Effect on cutting process

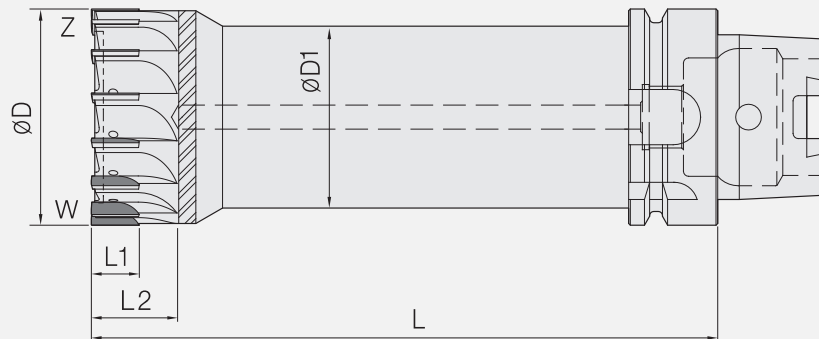
- Good - Protection of the tool head against wear
- Bad - Poor surface finish
- Difficulty of dimension control
- Cause of chipping or flaking on the edge

Endmill order form

Date.

| | | | | | |
|------------|-----------|--|----------|-----------|----------------|
| Customer | | | End_user | | |
| Work Piece | Part Name | | | Hardness | HRc / HRB |
| | Material | | | Roughness | Ra / Rz / Rmax |

Tool information



Tool size

| | | |
|----|------------------------|----|
| D | Diameter, Tolerance | mm |
| D1 | Diameter of shank body | mm |
| L1 | Length of tip | mm |
| L2 | Width of tip | mm |
| W | Length of tool | mm |
| L | No. of teeth | mm |
| Z | No. of flute | ea |
| F | Length of flute | ea |


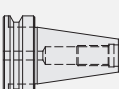
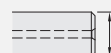
Shank

| | |
|-----------------------|--------------------------|
| Solid carbide | <input type="checkbox"/> |
| Solid carbide + Steel | <input type="checkbox"/> |
| Steel | <input type="checkbox"/> |

Coolant hole

| | |
|-----|--------------------------|
| Yes | <input type="checkbox"/> |
| No | <input type="checkbox"/> |

Holder & Adaptor

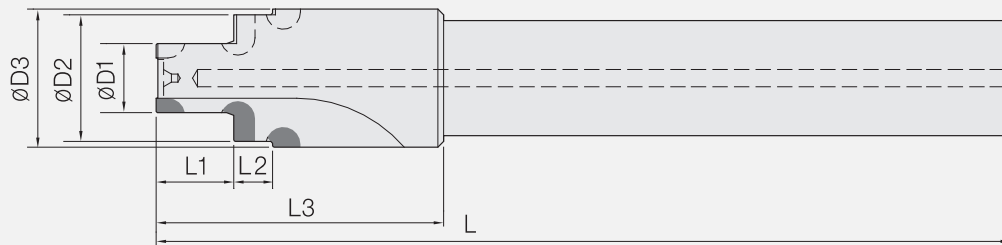
| | | |
|---|------|--------------------------|
|  | HSKA | <input type="checkbox"/> |
| | Size | 32, 40, 50, 63, 80, 100 |
|  | BT | <input type="checkbox"/> |
| | SK | <input type="checkbox"/> |
| | Size | 30, 40, 50 |
|  | Ø | mm |

Reamer order form

Date.

| | | | | | |
|------------|-----------|--|----------|-----------|----------------|
| Customer | | | End_user | | |
| Work Piece | Part Name | | | Hardness | HRc / HRB |
| | Material | | | Roughness | Ra / Rz / Rmax |

Tool information



Tool size

| | | |
|----|---------------------|----|
| D1 | Diameter, Tolerance | mm |
| D2 | Diameter, Tolerance | mm |
| D3 | Diameter, Tolerance | mm |
| L1 | Length of step | mm |
| L2 | Length of step | mm |
| L3 | Length of clearance | mm |
| L | Length of tool | mm |
| F | No. of flute | ea |


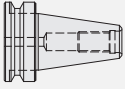


Shank

| | |
|-----------------------|--------------------------|
| Solid carbide | <input type="checkbox"/> |
| Solid carbide + Steel | <input type="checkbox"/> |
| Steel | <input type="checkbox"/> |

Coolant hole

| | |
|---------------|--------------------------|
| Yes (Y-hole) | <input type="checkbox"/> |
| Yes (Through) | <input type="checkbox"/> |
| No | <input type="checkbox"/> |



Holder & Adaptor

| | |
|---|---------------------------------|
|  | HSKA <input type="checkbox"/> |
| | Size 32, 40, 50, 63, 80, 100 |
|  | BT <input type="checkbox"/> |
| | SK <input type="checkbox"/> |
| | Size 30, 40, 50 |
|  | Module <input type="checkbox"/> |
| | Size 60, 70 |
|  | Ø mm |

Hole type

| | |
|--------------|--------------------------|
| Through hole | <input type="checkbox"/> |
| Blind hole | <input type="checkbox"/> |

Guide

| | |
|---|--------------------------|
| Yes  | <input type="checkbox"/> |
| No  | <input type="checkbox"/> |

Interrupted cut

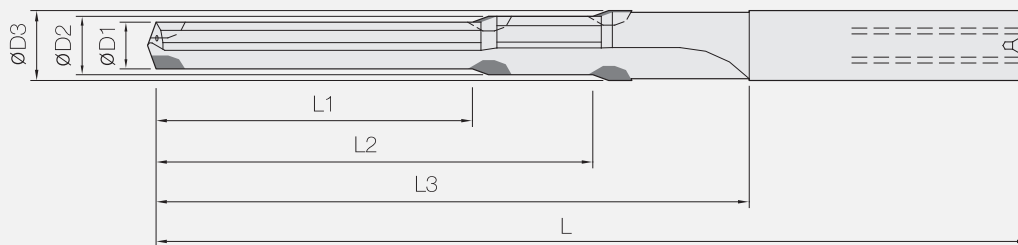
| | |
|-----|--------------------------|
| Yes | <input type="checkbox"/> |
| No | <input type="checkbox"/> |

Drill order form

Date.

| | | | | | |
|------------|-----------|--|----------|-----------|----------------|
| Customer | | | End_user | | |
| Work Piece | Part Name | | | Hardness | HRc / HRB |
| | Material | | | Roughness | Ra / Rz / Rmax |

Tool information



Tool size

| | | |
|----|---------------------|----|
| D1 | Diameter, Tolerance | mm |
| D2 | Diameter, Tolerance | mm |
| D3 | Diameter, Tolerance | mm |
| L1 | Length of step | mm |
| L2 | Length of step | mm |
| L3 | Length of clearance | mm |
| L | Length of tool | mm |
| F | No. of flute | ea |


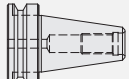

Shank

| | |
|-----------------------|--------------------------|
| Solid carbide | <input type="checkbox"/> |
| Solid carbide + Steel | <input type="checkbox"/> |
| Steel | <input type="checkbox"/> |

Coolant hole

| | |
|---------------|--------------------------|
| Yes (Y-hole) | <input type="checkbox"/> |
| Yes (Through) | <input type="checkbox"/> |
| No | <input type="checkbox"/> |



Holder & Adaptor

| | |
|---|-------------------------------|
|  | HSKA <input type="checkbox"/> |
| | Size 32, 40, 50, 63, 80, 100 |
|  | BT <input type="checkbox"/> |
| | SK <input type="checkbox"/> |
| | Size 30, 40, 50 |
|  | \varnothing mm |

Hole type

| | |
|--------------|--------------------------|
| Through hole | <input type="checkbox"/> |
| Blind hole | <input type="checkbox"/> |

Guide

| | |
|---|--------------------------|
| Yes  | <input type="checkbox"/> |
| No  | <input type="checkbox"/> |

Interrupted cut

| | |
|-----|--------------------------|
| Yes | <input type="checkbox"/> |
| No | <input type="checkbox"/> |

Test information

Date.

| | | | | | |
|---------------------|------------|--------------------------|------------------------|--------------------------|----------------|
| Customer | | | End_user | | |
| Work Piece | Part Name | | | Hardness | HRc / HRB |
| | Material * | | | Roughness | Ra / Rz / Rmax |
| Work figure Drawing | | | | | |
| Machine | M.C.T | <input type="checkbox"/> | C.N.C Turnig / Milling | <input type="checkbox"/> | |
| | Manual | <input type="checkbox"/> | Machine Maker | | |

Cutting data

| | | |
|-----------|-----------|--|
| Speed (V) | (m/min) | |
| RPM (N) | (rev/min) | |
| Feed (F) | (mm/rev) | |
| | (mm/min) | |
| D.O.C * | (pass) | |
| | (mm) | |

Cutting codition

| | | | |
|--------------|------------|----------------------------------|------------------------------------|
| Continuous * | Continuous | <input checked="" type="radio"/> | <input type="checkbox"/> |
| | Light | <input checked="" type="radio"/> | <input type="checkbox"/> |
| Interrupt * | Medium | <input checked="" type="radio"/> | <input type="checkbox"/> |
| | Heavy | <input checked="" type="radio"/> | <input type="checkbox"/> |
| Coolant* | Dry | | <input type="checkbox"/> |
| | Inner | <input type="checkbox"/> | Out (Wet) <input type="checkbox"/> |

Tool information

| | | | | | | |
|-----------------|--------------------------|--------------------------|--------------------------|--------------------------|-------------|--------------------------|
| Tool material * | PCD | <input type="checkbox"/> | SPEC * | | | |
| | PCBN | <input type="checkbox"/> | | Competitor * | | |
| | CVD | <input type="checkbox"/> | | | Tool life | (time) |
| | SCD | natural | | <input type="checkbox"/> | | (EA) |
| | | mono | | <input type="checkbox"/> | Operation * | turning |
| | TC | <input type="checkbox"/> | | milling | | <input type="checkbox"/> |
| | Cermet | <input type="checkbox"/> | | boring | | <input type="checkbox"/> |
| | Ceramic | <input type="checkbox"/> | | grooving / cutting | | <input type="checkbox"/> |
| Others | <input type="checkbox"/> | reaming | <input type="checkbox"/> | | | |
| | | endmill | <input type="checkbox"/> | | | |
| Shank * | T.C | <input type="checkbox"/> | drilling | <input type="checkbox"/> | | |
| | STEEL | <input type="checkbox"/> | Wearless | <input type="checkbox"/> | | |
| | T.C+STEEL | <input type="checkbox"/> | Need to be determined * | <input type="checkbox"/> | | |
| Mono block | <input type="checkbox"/> | | | | | |



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