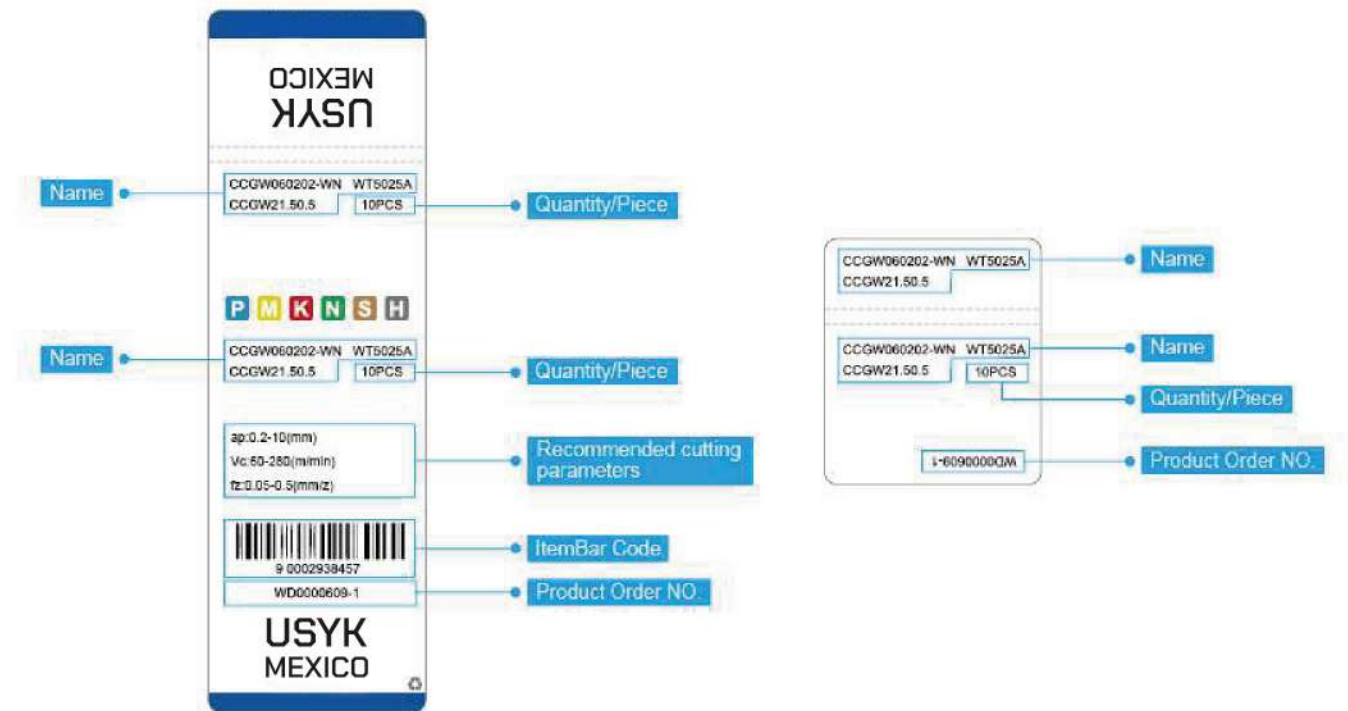


# USYK MEXICO



# USYK MEXICO

## Product Packing Introduction



Face Milling Tools **NEW**

SN..12Series



Product Introduction

- Double sided negative insert with 8 cutting edges
- Two classes tolerance type(M class and G class)
- Three-dimensional chipbreaker (JL/JM/JR) available in various applications
- 45°, 75°and 88°entering angle line


Face Milling Tools **NEW**

HN..09Series



Product Introduction

- Double sided negative insert with 12 cutting edges for economical machining
- Two classes tolerance type(M class and G class)
- Two-dimensional chipbreaker (JM/JR) available in various applications
- JR geometrie and CVD coated enable high speed and rough milling cast iron

Turning Tools 

High temperature alloys, Turnning



**Grade**

WT5015:Recommended for continus cutting of stainless steel  
General machining of heat resitant alloy  
Machining of hardened steels

**Chip Breaker**

FS:Finishing of exotic materials  
MS:Semi-fishing of exotic materials, stainless steel  
ES:Medium machining of stainless steel, heat resitant alloys, mild steel

USYK MEXICO

Parting & Grooving 

CMGDN Series



**Chip Breaker**

J:Recommended for parting and grooving of stainless steel, and low carbon steel  
C:Recommended for parting and grooving of alloy steel, carbon steel, cast iron, stainless steel and other materials

# Drilling Tools



## SP.-UD

Square drilling insert

## WC..-PD

Trigon drilling insert

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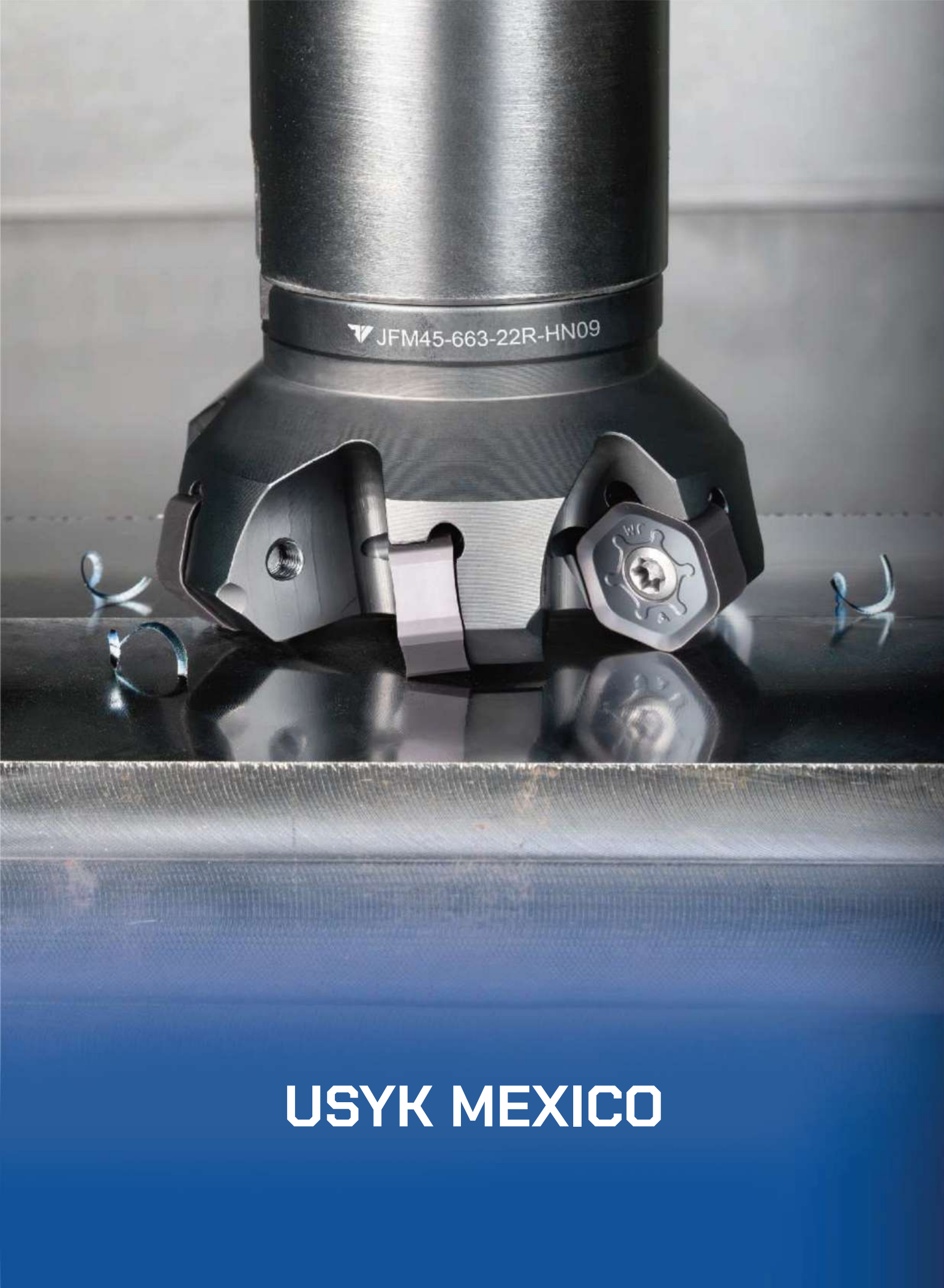
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**USYK MEXICO**

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Milling Insert Designation System

**A** **P** **K** **T**  

1 2 3 4 Space

**1 - Shape**

|          |          |          |          |          |
|----------|----------|----------|----------|----------|
| <b>A</b> | <b>C</b> | <b>H</b> | <b>L</b> | <b>O</b> |
|          |          |          |          |          |
| 85°      | 80°      | 120°     | 90°      | 135°     |
| <b>P</b> | <b>R</b> | <b>S</b> | <b>T</b> | <b>W</b> |
|          |          |          |          |          |
| 108°     | 360°     | 90°      | 60°      | 80°      |
| <b>Z</b> | others   |          |          |          |

**2 - Insert clearance angle**

|          |          |          |          |
|----------|----------|----------|----------|
| <b>A</b> | <b>B</b> | <b>C</b> | <b>D</b> |
|          |          |          |          |
| 3°       | 5°       | 7°       | 15°      |
| <b>E</b> | <b>F</b> | <b>G</b> | <b>N</b> |
|          |          |          |          |
| 20°      | 25°      | 30°      | 0°       |
| <b>P</b> | <b>O</b> | others   |          |
|          |          |          |          |
| 11°      |          |          |          |

**3 - Tolerance**

| Grade | Unit | d       | m       | s       |
|-------|------|---------|---------|---------|
| A     | mm   | ± 0.025 | ± 0.005 | ± 0.025 |
| C     | mm   | ± 0.025 | ± 0.013 | ± 0.025 |
| E     | mm   | ± 0.025 | ± 0.025 | ± 0.025 |
| F     | mm   | ± 0.013 | ± 0.005 | ± 0.025 |
| G     | mm   | ± 0.025 | ± 0.025 | ± 0.130 |
| H     | mm   | ± 0.013 | ± 0.013 | ± 0.025 |
| J     | mm   | *       | ± 0.005 | ± 0.025 |
| K     | mm   | *       | ± 0.013 | ± 0.025 |
| L     | mm   | *       | ± 0.025 | ± 0.025 |
| M     | mm   | *       | *       | ± 0.127 |
| U     | mm   | *       | *       | ± 0.127 |
| N     | mm   | *       | *       | ± 0.025 |

Shape: C, E, H, M, O, P, S, T, R, W

| IC     | d         |        | m      |        |
|--------|-----------|--------|--------|--------|
|        | J,K,L,M,N | U      | M, N   | U      |
| 4.76   | ± 0.05    | ± 0.08 | ± 0.08 | ± 0.13 |
| 5.56   | ± 0.05    | ± 0.08 | ± 0.08 | ± 0.13 |
| 6      | ± 0.05    | ± 0.08 | ± 0.08 | ± 0.13 |
| 6.35   | ± 0.05    | ± 0.08 | ± 0.08 | ± 0.13 |
| 7.94   | ± 0.05    | ± 0.08 | ± 0.08 | ± 0.13 |
| 8      | ± 0.05    | ± 0.08 | ± 0.08 | ± 0.13 |
| 9.525  | ± 0.05    | ± 0.08 | ± 0.08 | ± 0.13 |
| 10     | ± 0.05    | ± 0.08 | ± 0.08 | ± 0.13 |
| 12     | ± 0.08    | ± 0.13 | ± 0.13 | ± 0.20 |
| 12.7   | ± 0.08    | ± 0.13 | ± 0.13 | ± 0.20 |
| 15.875 | ± 0.10    | ± 0.18 | ± 0.15 | ± 0.27 |
| 16     | ± 0.10    | ± 0.18 | ± 0.15 | ± 0.27 |
| 19.05  | ± 0.10    | ± 0.18 | ± 0.15 | ± 0.27 |
| 20     | ± 0.10    | ± 0.18 | ± 0.15 | ± 0.27 |
| 25     | ± 0.13    | ± 0.25 | ± 0.18 | ± 0.38 |
| 25.4   | ± 0.13    | ± 0.25 | ± 0.18 | ± 0.38 |
| 31.75  | ± 0.15    | ± 0.25 | ± 0.20 | ± 0.38 |
| 32     | ± 0.15    | ± 0.25 | ± 0.20 | ± 0.38 |

| M&N grade | D shape |        | V shape |        |
|-----------|---------|--------|---------|--------|
|           | d       | m      | d       | m      |
| 5.56      | ± 0.05  | ± 0.11 |         |        |
| 6.35      | ± 0.05  | ± 0.11 | ± 0.05  | ± 0.16 |
| 7.94      | ± 0.05  | ± 0.11 | ± 0.05  | ± 0.16 |
| 9.525     | ± 0.05  | ± 0.11 | ± 0.05  | ± 0.16 |
| 12.7      | ± 0.08  | ± 0.15 | ± 0.08  | ± 0.20 |
| 15.875    | ± 0.10  | ± 0.18 | ± 0.10  | ± 0.27 |
| 19.05     | ± 0.10  | ± 0.18 | ± 0.10  | ± 0.27 |

**4 - Chipformer and clamp type**

|          |          |          |          |          |
|----------|----------|----------|----------|----------|
| <b>A</b> | <b>G</b> | <b>H</b> | <b>M</b> | <b>N</b> |
|          |          |          |          |          |
| <b>Q</b> | <b>T</b> | <b>U</b> | <b>W</b> | <b>X</b> |
|          |          |          |          |          |
|          | 40°-60°  | 40°-60°  | 40°-60°  | others   |

**16** **04** **PD** **E** **R**

5 6 7 8 9

**5 - Cutting edge length**

| Diameter of internal tangent circle (mm) | Insert shape |   |   |    |   |    |    |
|--|--------------|---|---|----|---|----|----|
|  | A            | C | H | R  | O | S  | T  |
| 3.180                                    |              |   |   |    |   |    | 5  |
| 3.970                                    |              |   |   |    |   |    | 6  |
| 5.000                                    |              |   |   | 5  |   |    |    |
| 5.560                                    |              |   |   |    |   |    | 9  |
| 6.000                                    |              |   |   | 6  |   |    |    |
| 6.350                                    |              | 6 |   |    |   |    | 11 |
| 7.940                                    |              |   |   |    |   |    | 13 |
| 8.000                                    |              |   |   | 8  |   |    |    |
| 9.525                                    |              | 9 |   | 9  |   | 9  | 16 |
| 10.000                                   |              |   |   | 10 |   |    |    |
| 12.000                                   |              |   |   | 12 |   |    |    |
| 12.700                                   | 12           |   | 5 |    | 5 | 12 | 22 |
| 13.400                                   |              |   |   |    |   | 13 |    |
| 15.875                                   | 16           |   |   | 15 |   | 15 | 27 |
| 16.500                                   |              |   | 9 |    |   |    |    |
| 16.000                                   |              |   |   | 16 | 6 |    |    |
| 19.050                                   | 19           |   |   | 19 |   | 19 | 33 |
| 20.000                                   |              |   |   | 20 |   |    |    |
| 20.200                                   |              |   |   |    | 8 |    |    |
| 25.000                                   |              |   |   | 25 |   |    |    |
| 25.400                                   | 25           |   |   | 25 |   | 25 | 44 |
| 31.750                                   |              |   |   | 31 |   |    |    |
| 32.000                                   |              |   |   | 32 |   |    |    |

**7 - Cutting edge corner**

**Corner radius**

MO = round insert (metric)

|            |            |
|------------|------------|
| 00 = Sharp | 24 = 2.4   |
| 01 = 0.1   | 28 = 2.8   |
| 02 = 0.2   | 31 = 3.1   |
| 04 = 0.4   | 40 = 4.0   |
| 08 = 0.8   | 48 = 4.8   |
| 12 = 1.2   | 56 = 5.6   |
| 16 = 1.6   | 64 = 6.4   |
| 20 = 2.0   | X = Others |

**Wiper corner**

| Entering angle(kr) | Relief angle(an) |
|--------------------|------------------|
| A = 45°            | A = 3°           |
| D = 60°            | B = 5°           |
| E = 75°            | C = 7°           |
| F = 85°            | D = 15°          |
| G = 87°            | E = 20°          |
| P = 90°            | F = 25°          |
| Z = Others         | G = 30°          |
|                    | N = 0°           |
|                    | P = 11°          |
|                    | Z = Others       |

**6 - Thickness**

Add 0 or T before rounding down

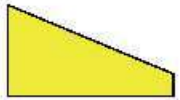
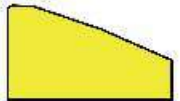


|                          |  |   |
|--------------------------|--|---|
| <b>A, B, C, N, O, W,</b> |  | Example:<br>01 = 1.59<br>T1 = 1.98<br>02 = 2.38<br>T3 = 3.97<br>04 = 4.76<br>05 = 5.56<br>06 = 6.35<br>07 = 7.94<br>09 = 9.52<br>11 = 11.11<br>12 = 12.70<br>14 = 14.29<br>15 = 15.88 |
| <b>H, M, R, T,</b>       |  |   |
| <b>F, G, J, U,</b>       |  |   |

**8 - Cutting edge design**

| Names | Photo | Clarification                                      |
|-------|-------|--|
| F     |       | Sharp cutting edge                                 |
| E     |       | Rounded cutting edges                              |
| T     |       | Negative chamfer cutting edge                      |
| S     |       | Negative chamfering and filleting of cutting edges |

**9 - Hand of tool**

### Chipbreaker Introduction

| Application       | Chip breaker |  | Applications and features   |
|-------------------|--------------|--|---|
| Light machining   | JL           |   | <ul style="list-style-type: none"> <li>• For stainless steel, steel, and exotic materials machining</li> <li>• Sharp cutting edge, low cutting force</li> </ul>           |
| General machining | JM           |   | <ul style="list-style-type: none"> <li>• For stainless steel, steel, cast iron and exotic materials machining</li> <li>• Sharp cutting edge, low cutting force</li> </ul> |
| Stable machining  | JR           |   | <ul style="list-style-type: none"> <li>• For roughing applications</li> <li>• For cast iron and steel machining</li> </ul>  |
| Stable machining  | TM           |  | <ul style="list-style-type: none"> <li>• For roughing or interrupted machining applications</li> <li>• Strong cutting edge credit to large land angle</li> </ul>          |

### Chipbreaker Application

| Materials |   |                                       |               | Chip breaker application |                         |                |                |   |
|-----------|---|---------------------------------------|---------------|--------------------------|-------------------------|----------------|----------------|---|
| ISO       | Material                                | Tensile strength (N/mm <sup>2</sup> ) | Hardness (HB) | JL<br>Low cutting forces | JM<br>General machining | JR<br>Roughing | TM<br>Roughing |   |
| P         | Non-alloy                               | ≤600                                  | ≤180          | ▲                        | ▲                       | ▲              | -              |   |
|           |   | ≤950                                  | ≤280          | ▲                        | ▲                       | ▲              | -              |   |
|           | Alloy steel                             | 700-950                               | 200-280       | ▲                        | ▲                       | ▲              | -              |   |
|           |   | 950-1200                              | 280-355       | ▲                        | ▲                       | ▲              | -              |   |
| M         | Precipitation hardening stainless steel | 1200-1400                             | 355-415       | ▲                        | ▲                       | ▲              | -              |   |
|           |   | 675                                   | 200           | ▲                        | ▲                       | -              | -              |   |
|           |   | 778                                   | 230           | ▲                        | ▲                       | -              | -              |   |
| K         | Gray cast iron                          | 1013                                  | 300           | ▲                        | ▲                       | -              | -              |   |
|           |   | 700                                   | 220           | -                        | ▲                       | ▲              | ▲              |   |
| S         | Nodular cast iron                       | 880                                   | 260           | -                        | ▲                       | ▲              | ▲              |   |
|           |   | 943                                   | 280           | ▲                        | ▲                       | -              | -              |   |
|           |   | 1076                                  | 320           | ▲                        | ▲                       | -              | -              |   |
|           |   | 1177                                  | 350           | ▲                        | ▲                       | -              | -              |   |
| N         | Titanium alloy                          | 1262                                  | 370           | ▲                        | ▲                       | -              | -              |   |
|           |   | 260                                   | 75            | -                        | -                       | -              | -              |   |
| H         | Pure aluminum                           | 447                                   | 130           | -                        | -                       | -              | -              |   |
|           |   | Hardened steel                        | -             | 50-60HRC                 | -                       | ▲              | -              | - |
|           |   | Chilled cast iron                     | -             | 55HRC                    | -                       | ▲              | -              | - |

▲ Indicates first recommendation   ▲ Indicates second recommendation   - Indicates not recommendation



ISO Application Range

| ISO application rang of Milling insert grades |                                |     |            |        |        |        |        |        |        |            |
|---|--------------------------------|-----|------------|--------|--------|--------|--------|--------|--------|------------|
| Material Group                                | Materials                      | ISO | PVD coated |        |        |        |        |        |        | CVD coated |
|   |                                |     | WT5025     | WT5030 | WT5035 | WT7020 | WT3330 | WT3020 | WT3010 | WT4020     |
| P   | Unalloyed steel, alloyed steel | P01 |            |        |        |        |        |        |        |            |
|   |                                | P05 |            |        |        |        |        |        |        |            |
|   |                                | P10 |            |        |        |        |        |        |        |            |
|   |                                | P15 |            |        |        |        |        |        |        |            |
|   |                                | P20 | WT5025     | WT5030 |        |        |        | WT3020 | WT3010 |            |
|   |                                | P25 |            |        |        |        |        |        |        |            |
|   |                                | P30 |            |        |        |        |        |        |        |            |
|   |                                | P35 |            |        | WT5035 |        |        |        |        |            |
|   |                                | P40 |            |        |        |        |        |        |        |            |
|   |                                | P45 |            |        |        |        |        |        |        |            |
| P50   |                                |     |            |        |        |        |        |        |        |            |
| M   | Stainless steel                | M01 |            |        |        |        |        |        |        |            |
|   |                                | M05 |            |        |        |        |        |        |        |            |
|   |                                | M10 |            |        |        |        |        |        |        |            |
|   |                                | M15 |            |        |        |        |        |        |        |            |
|   |                                | M20 | WT5025     | WT5030 |        |        | WT3330 |        |        |            |
|   |                                | M25 |            |        |        |        |        |        |        |            |
|   |                                | M30 |            |        |        |        |        |        |        |            |
|   |                                | M35 |            |        | WT5035 |        |        |        |        |            |
|   |                                | M40 |            |        |        |        |        |        |        |            |
|   |                                | M45 |            |        |        |        |        |        |        |            |
| K   | Cast iron                      | K01 |            |        |        |        |        |        |        |            |
|   |                                | K05 |            |        |        |        |        |        |        |            |
|   |                                | K10 |            |        |        |        |        |        |        |            |
|   |                                | K15 |            |        |        |        |        |        |        |            |
|   |                                | K20 |            |        |        |        |        |        |        |            |
|   |                                | K25 |            |        |        |        |        |        |        |            |
|   |                                | K30 |            |        |        |        |        |        |        |            |
|   |                                | K35 |            |        |        |        |        |        |        |            |
|   |                                | K40 |            |        |        |        |        |        |        |            |
|   |                                | K45 |            |        |        |        |        |        |        |            |
| S   | High temperature alloy         | S01 |            |        |        |        |        |        |        |            |
|   |                                | S05 |            |        |        |        |        |        |        |            |
|   |                                | S10 |            |        |        |        |        |        |        |            |
|   |                                | S15 |            |        |        |        |        |        |        |            |
|   |                                | S20 | WT5025     | WT5030 |        |        |        | WT3330 |        |            |
|   |                                | S25 |            |        |        |        |        |        |        |            |
|   |                                | S30 |            |        |        |        |        |        |        |            |
|   |                                | S35 |            |        |        |        |        |        |        |            |
|   |                                | S40 |            |        |        |        |        |        |        |            |
|   |                                | S45 |            |        |        |        |        |        |        |            |
| N   | Non-ferrous alloy              | N01 |            |        |        |        |        |        |        |            |
|   |                                | N05 |            |        |        |        |        |        |        |            |
|   |                                | N10 |            |        |        |        |        |        |        |            |
|   |                                | N15 |            |        |        |        |        |        |        |            |
|   |                                | N20 |            |        |        |        |        |        |        |            |
|   |                                | N25 |            |        |        |        |        |        |        |            |
|   |                                | N30 |            |        |        |        |        |        |        |            |
| H   | Hardened steel, cold cast iron | H01 |            |        |        |        |        |        |        |            |
|   |                                | H05 |            |        |        |        |        |        |        |            |
|   |                                | H10 |            |        |        |        |        |        |        |            |
|   |                                | H15 |            |        |        |        |        |        |        |            |
|   |                                | H20 |            |        |        |        |        |        |        |            |
|   |                                | H25 |            |        |        |        |        |        |        |            |
|   |                                | H30 |            |        |        |        |        |        |        |            |

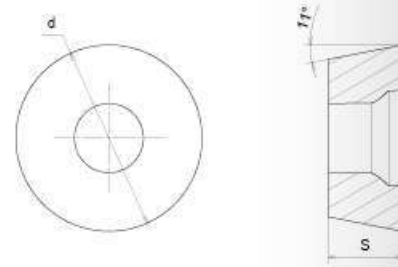
PVD Coated Carbide Grades

| Grade  | Appearance    | ISO range | Characteristics & applications   |
|--------|---------------|-----------|--|
| WT5025 | Black brown   | P15-P35   | • Submicron substrate and good wear resistance   |
|        |               | M15-M35   | • For general machining of steel, stainless steel and heat resistant alloy   |
|        |               | S15-S35   |  |
| WT5030 | Golden yellow | P15-P40   | • Submicron substrate and good wear resistance   |
|        |               | M15-M40   | • For general machining of steel, stainless steel and heat resistant alloy   |
|        |               | S15-S40   | • Suitable for wet cutting condition   |
| WT5035 | Grey black    | M25-M45   | • Tough substrate with good fracture toughness   |
|        |               | P25-P45   | • For interrupted roughing of stainless steel and steel  |
| WT7020 | Black brown   | K10-K30   | • Tough substrate for machining of cast iron<br>• General machining of gray cast iron, nodular cast iron and alloy cast iron |
| WT3330 | Bronze        | M15-M35   | • Submicron substrate and good wear resistance   |
|        |               | S15-S35   | • General machining of stainless steel and heat resistant alloy  |
| WT3020 | Grey black    | H15-H25   | • Submicron substrate and good wear resistance   |
|        |               | P10-P25   | • For general or finish machining of hardened steel and steel  |
| WT3010 | Grey black    | H05-H15   | • Hard substrate with excellent wear resistance  |
|        |               | P05-P15   | • For finishing fo hardened steel and high speed machining of steel  |

CVD Coated Carbide Grades

| Grade  | Appearance   | ISO Range | Characteristics & applications   |
|--------|--------------|-----------|--|
| WT4020 | Two-coloured | K15-K30   | • Tough substrate for machining of cast iron<br>• For high speed machining gray cast iron, nodular cast iron and alloy cast iron<br>• Suitable for dry cutting condition |

RPMW/RPMT Inserts



| Insert | Designation |           | Dimension |      | Cutting parameter |           | Grade  |        |        |        |        |        |        |        |   |   |
|--------|-------------|-----------|-----------|------|-------------------|-----------|--------|--------|--------|--------|--------|--------|--------|--------|---|---|
|        |             |           | d mm      | S mm | fz (mm/rev)       | ap (mm)   | WT5025 | WT5030 | WT5035 | WT3330 | WT7020 | WT9020 | WT3010 | WT3020 |   |   |
|        | RPMW        | 1003M0    | 10.0      | 3.18 | 0.20-0.70         | 0.20-5.00 | ▲      | ▲      |        |        |        |        |        |        | ▲ | ▲ |
|        |             | 10T3M0    | 10.0      | 3.97 | 0.20-0.70         | 0.20-5.00 | ▲      | △      | △      |        |        | △      |        |        | △ | ▲ |
|        |             | 1204M0    | 12.0      | 4.76 | 0.30-0.85         | 0.20-6.00 | ▲      | △      | △      |        |        | △      |        |        | △ | ▲ |
|        | RPMT        | 08T2M0-MM | 8.0       | 2.78 | 0.10-0.60         | 0.20-4.00 | ▲      | △      |        | ▲      |        |        |        |        |   |   |
|        |             | 10T3M0-MM | 10.0      | 3.97 | 0.20-0.70         | 0.20-5.00 | ▲      | △      |        | ▲      |        |        |        | ▲      | △ |   |
|        |             | 1204M0-MM | 12.0      | 4.76 | 0.30-0.85         | 0.20-6.00 | ▲      | △      |        | ▲      |        |        |        | ▲      | △ |   |
|        | RPMT        | 10T3M0-MP | 10.0      | 3.97 | 0.20-0.70         | 0.20-5.00 | ▲      | △      | ▲      | △      | △      |        |        | ▲      | ▲ |   |
|        |             | 1204M0-MP | 12.0      | 4.76 | 0.30-0.85         | 0.20-6.00 | ▲      | △      | ▲      | △      | △      |        |        | ▲      | ▲ |   |

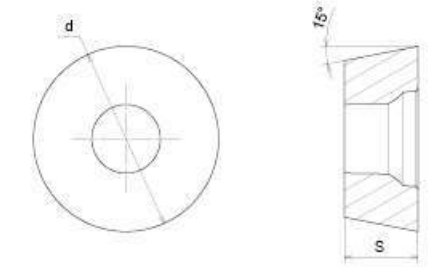
|   |                         |
|---|-------------------------|
| P | Steel                   |
| M | Stainless steel         |
| K | Cast Iron               |
| N | Non-ferrous alloys      |
| S | High temperature alloys |
| H | Hardened steel          |

Processing conditions

- Stable cutting
- General cutting
- ⚡ Unstable cutting

△ General stock ▲ Regular stock

RDMW/RDMT Inserts



| Insert | Designation |           | Dimension |      | Cutting parameter |           | Grade  |        |        |        |        |        |        |        |   |   |
|--------|-------------|-----------|-----------|------|-------------------|-----------|--------|--------|--------|--------|--------|--------|--------|--------|---|---|
|        |             |           | d mm      | S mm | fz (mm/rev)       | ap (mm)   | WT5025 | WT5030 | WT5035 | WT3330 | WT7020 | WT9020 | WT3010 | WT3020 |   |   |
|        | RDMW        | 0501M0    | 5.0       | 1.59 | 0.20-0.50         | 0.15-2.00 | ▲      |        |        |        |        |        |        |        |   |   |
|        |             | 0702M0    | 7.0       | 2.38 | 0.20-0.60         | 0.20-3.00 | ▲      | ▲      |        |        |        |        |        |        |   | ▲ |
|        |             | 10T3M0T   | 10.0      | 3.97 | 0.20-0.70         | 0.20-5.00 | △      |        | △      |        |        | ▲      |        | ▲      | ▲ |   |
|        |             | 1204M0T   | 12.0      | 4.76 | 0.25-0.80         | 0.25-6.00 | △      |        | △      |        |        | ▲      |        | △      | ▲ |   |
|        | RDMT        | 10T3M0-TM | 10.0      | 3.97 | 0.20-0.70         | 0.20-5.00 | ▲      |        |        |        |        |        |        | △      | ▲ |   |
|        |             | 1204M0-TM | 12.0      | 4.76 | 0.25-0.80         | 0.25-6.00 | ▲      |        |        |        |        |        |        | △      | ▲ |   |
|        |             | 1605M0-TM | 16.0      | 5.56 | 0.30-1.10         | 0.30-8.00 | ▲      |        |        |        |        |        |        |        |   |   |

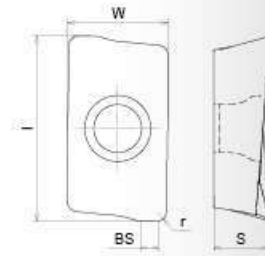
|   |                         |
|---|-------------------------|
| P | Steel                   |
| M | Stainless steel         |
| K | Cast Iron               |
| N | Non-ferrous alloys      |
| S | High temperature alloys |
| H | Hardened steel          |

Processing conditions

- Stable cutting
- General cutting
- ⚡ Unstable cutting

△ General stock ▲ Regular stock

APMT Inserts



| Insert | Designation      | Dimension |      |      |     |     |             | Cutting parameter |        | Grade  |        |        |         |         |        |        |  |
|--------|------------------|-----------|------|------|-----|-----|-------------|-------------------|--------|--------|--------|--------|---------|---------|--------|--------|--|
|        |                  | W mm      | L mm | S mm | r   | BS  | fz (mm/rev) | ap (mm)           | WT5025 | WT5030 | WT5035 | WT3330 | WT17020 | WT14020 | WT3010 | WT3020 |  |
|        | APMT 1135PDER-MP | 6.27      | 11.3 | 3.5  | 0.8 | 1.3 | 0.05-0.50   | 0.20-9.50         | ▲      | △      | △      | ▲      | ▲       | ▲       | ▲      | ▲      |  |
|        | APMT 1604PDER-MP | 9.37      | 16.4 | 4.76 | 0.8 | 1.6 | 0.06-1.00   | 0.20-14.50        | ▲      | △      | ▲      | ▲      | ▲       | △       | ▲      | ▲      |  |
|        | APMT 1135PDER-JM | 6.21      | 11.0 | 3.5  | 0.8 | 1.2 | 0.05-0.50   | 0.20-9.00         | ▲      | △      | △      | △      | ▲       | ▲       | ▲      | ▲      |  |
|        | APMT 1604PDER-JM | 9.27      | 16.5 | 4.76 | 0.8 | 1.4 | 0.06-1.00   | 0.20-14.50        | ▲      | △      | △      | △      | ▲       | ▲       | ▲      | ▲      |  |
|        | APMT 1135PDER-JH | 6.21      | 11.0 | 3.5  | 0.8 | 1.5 | 0.06-0.60   | 0.20-9.00         | ▲      | △      | ▲      | ▲      | ▲       | ▲       | ▲      | ▲      |  |
|        | APMT 1604PDER-JH | 9.27      | 16.5 | 4.76 | 0.8 | 1.7 | 0.08-1.20   | 0.20-14.50        | ▲      | △      | ▲      | ▲      | ▲       | △       | ▲      | ▲      |  |

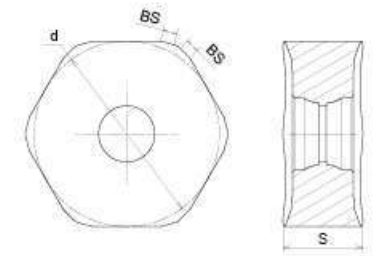
|   |                         |
|---|-------------------------|
| P | Steel                   |
| M | Stainless steel         |
| K | Cast Iron               |
| N | Non-ferrous alloys      |
| S | High temperature alloys |
| H | Hardened steel          |

Processing conditions

- Stable cutting
- ◐ General cutting
- ⊕ Unstable cutting

△ General stock ▲ Regular stock

HNMU/HNGU Inserts



| Insert | Designation      | Dimension |      |     | Cutting parameter |           | Grade  |        |        |        |         |         |        |        |   |
|--------|------------------|-----------|------|-----|-------------------|-----------|--------|--------|--------|--------|---------|---------|--------|--------|---|
|        |                  | d         | S    | BS  | fz (mm/rev)       | ap (mm)   | WT5025 | WT5030 | WT5035 | WT3330 | WT17020 | WT14020 | WT3010 | WT3020 |   |
|        | HNMU 0906ANSN-JM | 16.5      | 6.35 | 1.2 | 0.10-0.30         | 0.20-6.00 | ▲      | △      | ▲      | ▲      | ▲       | ▲       | ▲      | ▲      | ▲ |
|        | HNGU 0906ANSN-JM | 16.5      | 6.35 | 1.2 | 0.10-0.30         | 0.20-6.00 | ▲      | ▲      | △      | ▲      | ▲       | ▲       | ▲      | ▲      | ▲ |
|        | HNMU 0906ANSN-JR | 16.5      | 6.35 | 1.2 | 0.20-0.50         | 0.20-6.00 | ▲      | ▲      | ▲      | ▲      | ▲       | ▲       | ▲      | ▲      | ▲ |
|        | HNGU 0906ANSN-JR | 16.5      | 6.35 | 1.2 | 0.20-0.50         | 0.20-6.00 | ▲      | ▲      | ▲      | ▲      | ▲       | ▲       | ▲      | ▲      | ▲ |

|   |                         |
|---|-------------------------|
| P | Steel                   |
| M | Stainless steel         |
| K | Cast Iron               |
| N | Non-ferrous alloys      |
| S | High temperature alloys |
| H | Hardened steel          |

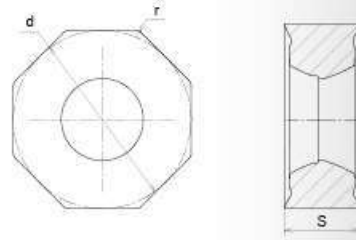
Processing conditions

- Stable cutting
- ◐ General cutting
- ⊕ Unstable cutting

△ General stock ▲ Regular stock



ONMU/ONHU Inserts



| Insert | Designation       | Dimension |     |     |     | Cutting parameter |           | Grade  |        |        |        |        |        |        |        |  |
|--------|-------------------|-----------|-----|-----|-----|-------------------|-----------|--------|--------|--------|--------|--------|--------|--------|--------|--|
|        |                   | d         | S   | BS  | r   | fz (mm/rev)       | ap (mm)   | WT5025 | WT5030 | WT5035 | WT3330 | WT3020 | WT3020 | WT3010 | WT3020 |  |
|        | ONMU 080608ANN-JL | 20.2      | 6.0 | 2.0 | 0.8 | 0.10-0.30         | 0.20-5.00 | ▲      | △      |        |        | △      |        |        |        |  |
|        | ONHU 080608ANN-JL | 20.2      | 6.0 | 2.0 | 0.8 | 0.12-0.30         | 0.20-5.00 | ▲      | △      |        |        | △      |        |        |        |  |
|        | ONMU 080608-JM    | 20.2      | 6.0 |     | 0.8 | 0.12-0.30         | 0.20-5.00 | ▲      |        | △      |        | ▲      |        |        |        |  |
|        | ONHU 080608-JM    | 20.2      | 6.0 |     | 0.8 | 0.12-0.30         | 0.20-5.00 | ▲      |        | △      |        | ▲      |        |        |        |  |
|        | ONMU 080608-JR    | 20.2      | 6.0 |     | 0.8 | 0.20-0.30         | 0.20-5.00 | ▲      |        | ▲      |        | ▲      | ▲      |        |        |  |
|        | ONHU 080608-JR    | 20.2      | 6.0 |     | 0.8 | 0.20-0.30         | 0.20-5.00 | ▲      |        | ▲      |        | ▲      | ▲      |        |        |  |

|   |                         |
|---|-------------------------|
| P | Steel                   |
| M | Stainless steel         |
| K | Cast Iron               |
| N | Non-ferrous alloys      |
| S | High temperature alloys |
| H | Hardened steel          |

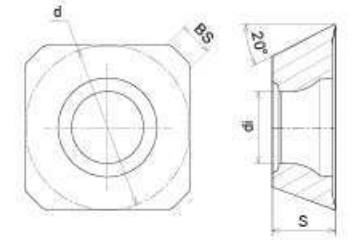
Processing conditions

- Stable cutting
- General cutting
- ⚡ Unstable cutting

|   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|
| ● | ● | ⚡ |   |   | ● | ● |
| ● | ● |   |   |   |   |   |
|   |   | ⚡ | ● | ● |   |   |
| ● | ● |   |   |   |   |   |

△ General stock ▲ Regular stock

SEKT/SEMT Inserts



| Insert | Designation      | Dimension |      |     |     | Cutting parameter |           | Grade  |        |        |        |        |        |        |        |  |
|--------|------------------|-----------|------|-----|-----|-------------------|-----------|--------|--------|--------|--------|--------|--------|--------|--------|--|
|        |                  | d mm      | S mm | di  | BS  | fz (mm/rev)       | ap (mm)   | WT5025 | WT5030 | WT5035 | WT3330 | WT3020 | WT3020 | WT3010 | WT3020 |  |
|        | SEKT 1204AFTN-JM | 12.7      | 4.76 | 5.5 | 1.7 | 0.20-0.70         | 0.50-6.50 | ▲      | △      |        | ▲      | ▲      |        |        |        |  |
|        | SEMT 13T3AGSN-JM | 13.4      | 3.97 | 4.4 | 2.0 | 0.20-0.70         | 0.50-6.50 | ▲      | △      |        | ▲      |        |        |        |        |  |

|   |                         |
|---|-------------------------|
| P | Steel                   |
| M | Stainless steel         |
| K | Cast Iron               |
| N | Non-ferrous alloys      |
| S | High temperature alloys |
| H | Hardened steel          |

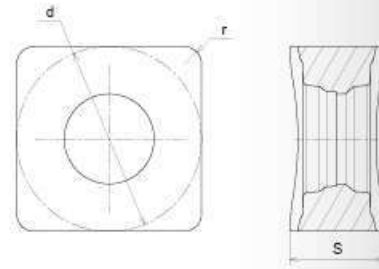
Processing conditions

- Stable cutting
- General cutting
- ⚡ Unstable cutting

|   |   |  |   |   |  |  |
|---|---|--|---|---|--|--|
| ● | ● |  |   |   |  |  |
| ● | ● |  | ● |   |  |  |
|   |   |  |   | ● |  |  |
| ● | ● |  | ● |   |  |  |

△ General stock ▲ Regular stock

SNMX/SNGX Inserts



| Insert | Designation    | Dimension |      |    |     | Cutting parameter |            | Grade  |        |        |        |        |        |        |        |  |
|--------|----------------|-----------|------|----|-----|-------------------|------------|--------|--------|--------|--------|--------|--------|--------|--------|--|
|        |                | d         | S    | BS | r   | fz (mm/rev)       | ap (mm)    | WT5025 | WT5030 | WT5035 | WT3330 | WT4020 | WT4020 | WT3010 | WT3020 |  |
|        | SNMX 120512-JL | 12.7      | 6.35 |    | 1.2 | 0.12-0.35         | 0.20-10.00 | ▲      |        | △      | ▲      | △      |        |        |        |  |
|        | SNMX 120512-JM | 12.7      | 6.35 |    | 1.2 | 0.12-0.38         | 0.20-10.00 | ▲      | △      | △      |        | ▲      | △      |        |        |  |
|        | SNMX 120520-JM | 12.7      | 6.35 |    | 2.0 | 0.12-0.38         | 0.20-10.00 | ▲      |        | ▲      |        | ▲      | ▲      |        |        |  |
|        | SNMX 120512-JR | 12.7      | 6.35 |    | 1.2 | 0.12-0.40         | 0.20-10.00 | ▲      | △      | △      |        | ▲      |        |        |        |  |
|        | SNMX 120520-JR | 12.7      | 6.35 |    | 2.0 | 0.12-0.40         | 0.20-10.00 | ▲      |        | ▲      |        | △      | ▲      |        |        |  |
|        | SNGX 120512-JM | 12.7      | 6.35 |    | 1.2 | 0.12-0.38         | 0.20-10.00 | ▲      | △      | ▲      | ▲      | ▲      | △      |        |        |  |

|   |                         |
|---|-------------------------|
| P | Steel                   |
| M | Stainless steel         |
| K | Cast Iron               |
| N | Non-ferrous alloys      |
| S | High temperature alloys |
| H | Hardened steel          |

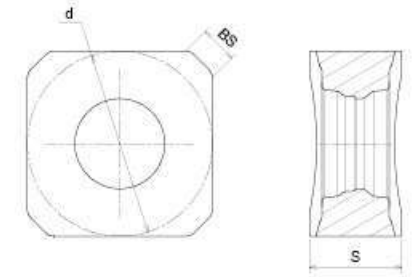
Processing conditions

- Stable cutting
- General cutting
- ⊕ Unstable cutting

|   |   |   |   |  |  |   |   |  |  |  |  |  |  |  |  |  |
|---|---|---|---|--|--|---|---|--|--|--|--|--|--|--|--|--|
| ● | ● | ⊕ |   |  |  |   |   |  |  |  |  |  |  |  |  |  |
| ● | ● | ⊕ | ● |  |  |   |   |  |  |  |  |  |  |  |  |  |
|   |   |   |   |  |  | ● | ● |  |  |  |  |  |  |  |  |  |
| ● | ● |   | ● |  |  |   |   |  |  |  |  |  |  |  |  |  |

△ General stock ▲ Regular stock

SNMX/SNGX-ANN Inserts



| Insert | Designation     | Dimension |      |     |   | Cutting parameter |           | Grade  |        |        |        |        |        |        |        |  |
|--------|-----------------|-----------|------|-----|---|-------------------|-----------|--------|--------|--------|--------|--------|--------|--------|--------|--|
|        |                 | d         | S    | BS  | r | fz (mm/rev)       | ap (mm)   | WT5025 | WT5030 | WT5035 | WT3330 | WT4020 | WT4020 | WT3010 | WT3020 |  |
|        | SNMX 1205ANN-JL | 12.7      | 6.35 | 1.6 |   | 0.15-0.35         | 0.20-6.50 | ▲      | △      |        |        | ▲      |        |        |        |  |
|        | SNGX 1205ANN-JL | 12.7      | 6.35 | 1.6 |   | 0.15-0.35         | 0.20-6.50 | ▲      |        |        |        | ▲      | ▲      |        |        |  |
|        | SNMX 1205ANN-JM | 12.7      | 6.35 | 1.6 |   | 0.15-0.38         | 0.20-6.50 | ▲      | △      | ▲      |        | ▲      | △      |        |        |  |
|        | SNGX 1205ANN-JM | 12.7      | 6.35 | 1.6 |   | 0.15-0.38         | 0.20-6.50 | ▲      | △      |        |        | ▲      | ▲      | ▲      |        |  |
|        | SNMX 1205ANN-JR | 12.7      | 6.35 | 1.6 |   | 0.15-0.40         | 0.20-6.50 | ▲      |        | ▲      |        | △      | ▲      |        |        |  |
|        | SNGX 1205ANN-JR | 12.7      | 6.35 | 1.6 |   | 0.15-0.40         | 0.20-6.50 | ▲      |        | △      |        | △      |        |        |        |  |

|   |                         |
|---|-------------------------|
| P | Steel                   |
| M | Stainless steel         |
| K | Cast Iron               |
| N | Non-ferrous alloys      |
| S | High temperature alloys |
| H | Hardened steel          |

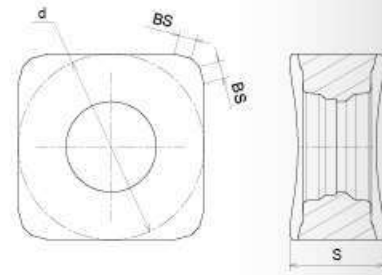
Processing conditions

- Stable cutting
- General cutting
- ⊕ Unstable cutting

|   |   |   |   |  |  |   |   |  |  |  |  |  |  |  |  |  |
|---|---|---|---|--|--|---|---|--|--|--|--|--|--|--|--|--|
| ● | ● | ⊕ |   |  |  |   |   |  |  |  |  |  |  |  |  |  |
| ● | ● | ⊕ | ● |  |  |   |   |  |  |  |  |  |  |  |  |  |
|   |   |   |   |  |  | ● | ● |  |  |  |  |  |  |  |  |  |
| ● | ● |   | ● |  |  |   |   |  |  |  |  |  |  |  |  |  |

△ General stock ▲ Regular stock

SNGX-ENN Inserts



| Insert | Designation     | Dimension |      |     |   | Cutting parameter |           | Grade  |        |        |        |        |        |        |        |  |
|--------|-----------------|-----------|------|-----|---|-------------------|-----------|--------|--------|--------|--------|--------|--------|--------|--------|--|
|        |                 | d         | S    | BS  | r | fz (mm/rev)       | ap (mm)   | WT5025 | WT5030 | WT5035 | WT3330 | WT7020 | WT4020 | WT3010 | WT3020 |  |
|        | SNGX 1205ENN-JL | 12.7      | 6.35 | 1.2 |   | 0.10-0.27         | 0.20-8.00 | ▲      | △      | △      | ▲      | ▲      |        |        |        |  |
|        | SNGX 1205ENN-JM | 12.7      | 6.35 | 1.2 |   | 0.12-0.30         | 0.20-8.00 | ▲      | △      | ▲      | ▲      | ▲      |        |        |        |  |
|        | SNGX 1205ENN-JR | 12.7      | 6.35 | 1.2 |   | 0.12-0.33         | 0.20-8.00 | ▲      | △      | ▲      | ▲      | ▲      |        |        |        |  |

|   |                         |
|---|-------------------------|
| P | Steel                   |
| M | Stainless steel         |
| K | Cast Iron               |
| N | Non-ferrous alloys      |
| S | High temperature alloys |
| H | Hardened steel          |

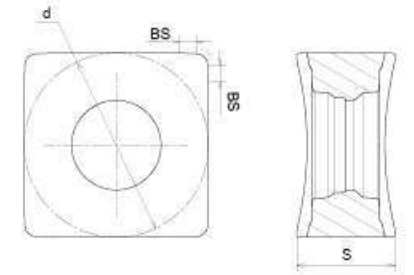
Processing conditions

- Stable cutting
- General cutting
- ✘ Unstable cutting

|   |   |   |   |  |  |  |   |
|---|---|---|---|--|--|--|---|
| ● | ● | ✘ | ● |  |  |  |   |
| ● | ● | ✘ | ● |  |  |  | ● |
| ● | ● | ✘ |   |  |  |  |   |
| ● | ● | ✘ |   |  |  |  |   |

△ General stock ▲ Regular stock

SNMX/SNGX-ZNN Inserts



| Insert | Designation     | Dimension |      |     |   | Cutting parameter |           | Grade  |        |        |        |        |        |        |        |  |
|--------|-----------------|-----------|------|-----|---|-------------------|-----------|--------|--------|--------|--------|--------|--------|--------|--------|--|
|        |                 | d         | S    | BS  | r | fz (mm/rev)       | ap (mm)   | WT5025 | WT5030 | WT5035 | WT3330 | WT7020 | WT4020 | WT3010 | WT3020 |  |
|        | SNMX 1205ZNN-JM | 12.7      | 6.35 | 1.2 |   | 0.12-0.27         | 0.20-10.0 | ▲      |        | ▲      | ▲      |        |        |        |        |  |
|        | SNGX 1205ZNN-JL | 12.7      | 6.35 | 1.2 |   | 0.10-0.24         | 0.20-10.0 | ▲      |        |        |        | ▲      | ▲      |        |        |  |
|        | SNGX 1205ZNN-JM | 12.7      | 6.35 | 1.2 |   | 0.12-0.27         | 0.20-10.0 | ▲      |        | ▲      | ▲      | ▲      | ▲      |        |        |  |
|        | SNGX 1205ZNN-JR | 12.7      | 6.35 | 1.2 |   | 0.12-0.30         | 0.20-10.0 | ▲      |        | ▲      | ▲      | ▲      | ▲      |        |        |  |

|   |                         |
|---|-------------------------|
| P | Steel                   |
| M | Stainless steel         |
| K | Cast Iron               |
| N | Non-ferrous alloys      |
| S | High temperature alloys |
| H | Hardened steel          |

Processing conditions

- Stable cutting
- General cutting
- ✘ Unstable cutting

|   |   |   |  |  |  |  |   |
|---|---|---|--|--|--|--|---|
| ● | ● | ✘ |  |  |  |  |   |
| ● | ● | ✘ |  |  |  |  | ● |
| ● | ● |   |  |  |  |  |   |
| ● | ● |   |  |  |  |  |   |

△ General stock ▲ Regular stock

## Face Milling Cutter Designation System

|          |           |           |   |          |          |           |          |           |          |          |             |          |          |
|----------|-----------|-----------|---|----------|----------|-----------|----------|-----------|----------|----------|-------------|----------|----------|
| <b>J</b> | <b>FM</b> | <b>75</b> |   | <b>-</b> | <b>6</b> | <b>80</b> | <b>-</b> | <b>27</b> | <b>R</b> | <b>-</b> | <b>SE12</b> | <b>-</b> | <b>C</b> |
| 1        | 2         | 3         | 4 | -        | 5        | 6         | -        | 7         | 8        | -        | 9           | -        | 10       |

**1 - Brand**

**2 - Milling type**

FM: Face milling  
 SM: Square shoulder milling  
 DM: Groove side and face machining  
 TM: Thread milling

**3 - Entering angle**

90=90°  
 45=45°  
 60=60°  
 75=75°  
 R: Round shape insert

**4 - Clamping method**

Unmarked: Screw clamp  
 W: Wedge clamp  
 S: Tool holder

**5 - Teeth number**

6=6teeth  
 8=8teeth

**6 - Diameter**

40=40mm  
 160=160mm

**7 - Connection method**

numerical: arbor  
 value: side retaining  
 W  
 C value: cylindrical handle  
 M value: screw connection

**8 - Feed direction**

R: Right  
 L: Left

**9 - Insert information**

SE12: SE12 insert



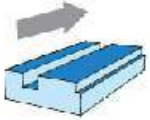


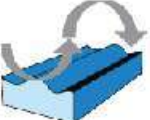
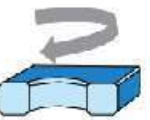

**10 - Remarks**

C: Internal cooling  
 Unmarked: No internal cooling







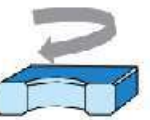





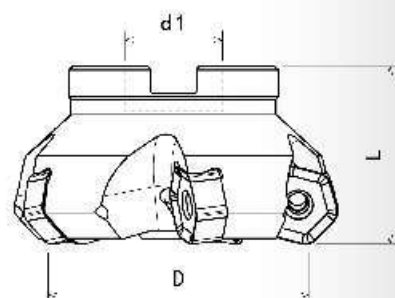
Face Mills Selecton Guide

| Series                    |                    | JFM45-HN09  | JFM42-OD06 | JFM45-ON05 | JFM45-ON08 |   |
|---------------------------|--------------------|---|------------|------------|------------|---|
| Page                      |                    | M24   | M25        | M26        | M27        |   |
| Approach angle            |                    | 45°   | 42°        | 45°        | 45°        |   |
| Maximum cutting depth(mm) |                    | 6   | 4.5        | 3.5        | 5.5        |   |
| Diameter range(mm)        |                    | D63-200   | D50-160    | D50-160    | D63-160    |   |
| Insert                    |                    | HN..09  | OD..0605   | ON..05     | ON..08     |   |
| Application               | Face milling       |    | ●          | ●          | ●          | ● |
|                           | Shoulder milling   |   |            |            |            |   |
|                           | Slot milling       |  |            |            |            |   |
|                           | Straight ramping   |  |            | ●          |            |   |
|                           | Helical in ramping |  |            | ●          |            |   |
|                           | Profile milling    |  |            |            |            |   |
|                           | Chamfer milling    |  |            | ●          |            |   |
|                           | Step down          |  |            | ●          |            |   |



Face Mills Selection Guide

| Series                    |                    | JFM45-SN12  | JFM75-SN12                   | JFM88-SN12                   |   |
|---------------------------|--------------------|---|------------------------------|------------------------------|---|
| Page                      |                    | M28   | M29                          | M30                          |   |
| Approach angle            |                    | 45°   | 75°                          | 88°                          |   |
| Maximum cutting depth(mm) |                    | 6.5   | 8.0                          | 10.0                         |   |
| Diameter range(mm)        |                    | D50-160   | D50-160                      | D50-160                      |   |
| Insert                    |                    | SN_X 1205ANN<br>SN_X 1205...  | SN_X 1205ENN<br>SN_X 1205... | SN_X 1205ZNN<br>SN_X 1205... |   |
| Application               | Face milling       |    | ●                            | ●                            | ● |
|                           | Shoulder milling   |   |                              |                              |   |
|                           | Slot milling       |  |                              |                              |   |
|                           | Straight ramping   |  |                              |                              |   |
|                           | Helical in ramping |  |                              |                              |   |
|                           | Profile milling    |  |                              |                              |   |
|                           | Chamfer milling    |  |                              |                              |   |
|                           | Step down          |  |                              |                              |   |

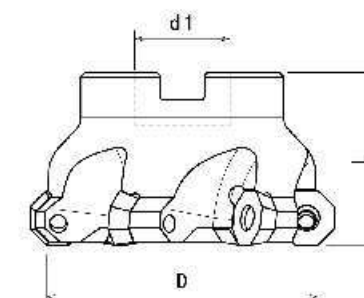
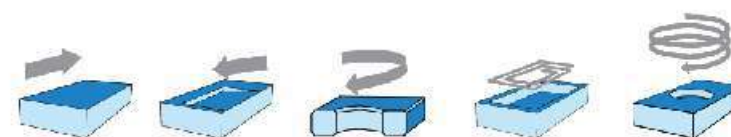
JFM45-HN09





| Designation          | D   | d1 | L  | ap(max) | Z  | Insert  |  |
|----------------------|-----|----|----|---------|----|---------|--|
| JFM45-450-22R-HN09   | 50  | 22 | 40 | 6       | 4  | HN...09 |  |
| JFM45-663-22R-HN09   | 63  | 22 | 40 | 6       | 6  |         |  |
| JFM45-680-27R-HN09   | 80  | 27 | 50 | 6       | 6  |         |  |
| JFM45-880-27R-HN09   | 80  | 27 | 50 | 6       | 8  |         |  |
| JFM45-6100-32R-HN09  | 100 | 32 | 50 | 6       | 6  |         |  |
| JFM45-8100-32R-HN09  | 100 | 32 | 50 | 6       | 8  |         |  |
| JFM45-10100-32R-HN09 | 100 | 32 | 50 | 6       | 10 |         |  |
| JFM45-8125-40R-HN09  | 125 | 40 | 63 | 6       | 8  |         |  |
| JFM45-10125-40R-HN09 | 125 | 40 | 63 | 6       | 10 |         |  |
| JFM45-12125-40R-HN09 | 125 | 40 | 63 | 6       | 12 |         |  |
| JFM45-8160-40R-HN09  | 160 | 40 | 63 | 6       | 8  |         |  |
| JFM45-12160-40R-HN09 | 160 | 40 | 63 | 6       | 12 |         |  |
| JFM45-14160-40R-HN09 | 160 | 40 | 63 | 6       | 14 |         |  |
| JFM45-10200-60R-HN09 | 200 | 60 | 63 | 6       | 10 |         |  |
| JFM45-12200-60R-HN09 | 200 | 60 | 63 | 6       | 12 |         |  |
| JFM45-14200-60R-HN09 | 200 | 60 | 63 | 6       | 14 |         |  |
|                      |     |    |    |         |    |         |  |
|                      |     |    |    |         |    |         |  |
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| Dimension | Components  |  |         |
|-----------|---|--|---------|
| Diameter  | Screw type  | Spanner type   | Torsion |
| D63-200   | <br>JS045120 | <br>T20 | 5.0 Nm  |

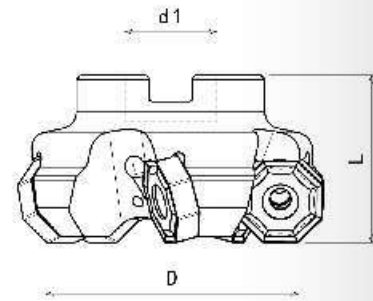
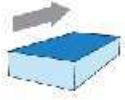
JFM42-OD06



| Designation          | D   | d1 | L  | ap(max) | Z  | Insert   |
|----------------------|-----|----|----|---------|----|----------|
| JFM42-450-22R-OD06   | 50  | 22 | 40 | 4.5     | 4  | OD..0605 |
| JFM42-563-22R-OD06   | 63  | 22 | 40 | 4.5     | 5  |          |
| JFM42-580-27R-OD06   | 80  | 27 | 50 | 4.5     | 5  |          |
| JFM42-680-27R-OD06   | 80  | 27 | 50 | 4.5     | 6  |          |
| JFM42-6100-32R-OD06  | 100 | 32 | 50 | 4.5     | 6  |          |
| JFM42-7100-32R-OD06  | 100 | 32 | 50 | 4.5     | 7  |          |
| JFM42-7125-40R-OD06  | 125 | 40 | 63 | 4.5     | 7  |          |
| JFM42-8125-40R-OD06  | 125 | 40 | 63 | 4.5     | 8  |          |
| JFM42-10160-40R-OD06 | 160 | 40 | 63 | 4.5     | 10 |          |
|                      |     |    |    |         |    |          |
|                      |     |    |    |         |    |          |
|                      |     |    |    |         |    |          |
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|                      |     |    |    |         |    |          |
|                      |     |    |    |         |    |          |

| Dimension | Components  |  |         |
|-----------|---|--|---------|
| Diameter  | Screw type  | Spanner type   | Torsion |
| D50-160   | <br>JS050120 | <br>T20 | 5.0 Nm  |

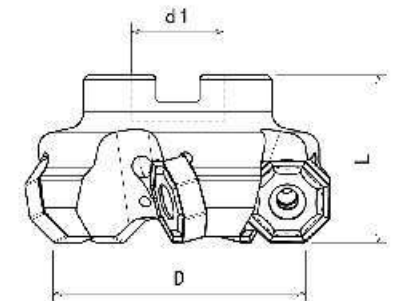
JFM45-ON05



| Designation          | D   | d1 | L  | ap(max) | Z  | Insert |  |
|----------------------|-----|----|----|---------|----|--------|--|
| JFM45-450-22R-ON05   | 50  | 22 | 40 | 3.5     | 4  | ON..05 |  |
| JFM45-650-22R-ON05   | 50  | 22 | 40 | 3.5     | 6  |        |  |
| JFM45-463-22R-ON05   | 63  | 22 | 40 | 3.5     | 4  |        |  |
| JFM45-663-22R-ON05   | 63  | 22 | 40 | 3.5     | 6  |        |  |
| JFM45-863-22R-ON05   | 63  | 22 | 40 | 3.5     | 8  |        |  |
| JFM45-780-27R-ON05   | 80  | 27 | 50 | 3.5     | 7  |        |  |
| JFM45-1080-27R-ON05  | 80  | 27 | 50 | 3.5     | 10 |        |  |
| JFM45-8100-32R-ON05  | 100 | 32 | 50 | 3.5     | 8  |        |  |
| JFM45-12100-32R-ON05 | 100 | 32 | 50 | 3.5     | 12 |        |  |
| JFM45-6125-40R-ON05  | 125 | 40 | 63 | 3.5     | 6  |        |  |
| JFM45-10125-40R-ON05 | 125 | 40 | 63 | 3.5     | 10 |        |  |
| JFM45-16125-40R-ON05 | 125 | 40 | 63 | 3.5     | 16 |        |  |
| JFM45-12160-40R-ON05 | 160 | 40 | 63 | 3.5     | 12 |        |  |
|                      |     |    |    |         |    |        |  |
|                      |     |    |    |         |    |        |  |
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|                      |     |    |    |         |    |        |  |

| Dimension | Components |              |         |
|-----------|------------|--------------|---------|
| Diameter  | Screw type | Spanner type | Torsion |
| D50-160   | JS040090   | T15          | 3.5Nm   |

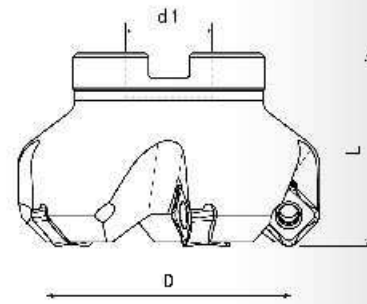
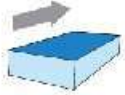
JFM45-ON08





| Designation          | D   | d1 | L  | ap(max) | Z  | Insert |  |
|----------------------|-----|----|----|---------|----|--------|--|
| JFM45-563-27R-ON08   | 63  | 22 | 40 | 5.5     | 5  | ON..08 |  |
| JFM45-680-27R-ON08   | 80  | 27 | 50 | 5.5     | 6  |        |  |
| JFM45-880-27R-ON08   | 80  | 27 | 50 | 5.5     | 8  |        |  |
| JFM45-7100-32R-ON08  | 100 | 32 | 50 | 5.5     | 7  |        |  |
| JFM45-10100-32R-ON08 | 100 | 32 | 50 | 5.5     | 10 |        |  |
| JFM45-8125-40R-ON08  | 125 | 40 | 63 | 5.5     | 8  |        |  |
| JFM45-12125-40R-ON08 | 125 | 40 | 63 | 5.5     | 12 |        |  |
| JFM45-10160-40R-ON08 | 160 | 40 | 63 | 5.5     | 10 |        |  |
| JFM45-15160-40R-ON08 | 160 | 40 | 63 | 5.5     | 15 |        |  |
|                      |     |    |    |         |    |        |  |
|                      |     |    |    |         |    |        |  |
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|                      |     |    |    |         |    |        |  |
|                      |     |    |    |         |    |        |  |
|                      |     |    |    |         |    |        |  |

| Dimension | Components |              |         |
|-----------|------------|--------------|---------|
| Diameter  | Screw type | Spanner type | Torsion |
| D63-160   | JS050120   | T20          | 5.0Nm   |

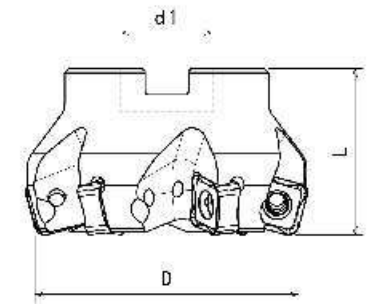
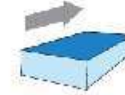
JFM45-SN12





| Designation          | D   | d1 | L  | ap(max) | Z  | Insert                       |  |
|----------------------|-----|----|----|---------|----|------------------------------|--|
| JFM45-450-22R-SN12   | 50  | 22 | 40 | 6.5     | 4  | SN_X 1205ANN<br>SN_X 1205... |  |
| JFM45-463-22R-SN12   | 63  | 22 | 40 | 6.5     | 4  |                              |  |
| JFM45-663-22R-SN12   | 63  | 22 | 40 | 6.5     | 6  |                              |  |
| JFM45-580-27R-SN12   | 80  | 22 | 50 | 6.5     | 5  |                              |  |
| JFM45-780-27R-SN12   | 80  | 27 | 50 | 6.5     | 7  |                              |  |
| JFM45-6100-32R-SN12  | 100 | 27 | 50 | 6.5     | 6  |                              |  |
| JFM45-8100-32R-SN12  | 100 | 32 | 50 | 6.5     | 8  |                              |  |
| JFM45-8125-40R-SN12  | 125 | 32 | 63 | 6.5     | 8  |                              |  |
| JFM45-10125-40R-SN12 | 125 | 40 | 63 | 6.5     | 10 |                              |  |
| JFM45-10160-40R-SN12 | 160 | 40 | 63 | 6.5     | 10 |                              |  |
|                      |     |    |    |         |    |                              |  |
|                      |     |    |    |         |    |                              |  |
|                      |     |    |    |         |    |                              |  |
|                      |     |    |    |         |    |                              |  |
|                      |     |    |    |         |    |                              |  |
|                      |     |    |    |         |    |                              |  |
|                      |     |    |    |         |    |                              |  |

| Dimension | Components  |  |         |
|-----------|---|--|---------|
| Diameter  | Screw type  | Spanner type   | Torsion |
| D50-160   | <br>JS050120 | <br>T20 | 5.0Nm   |

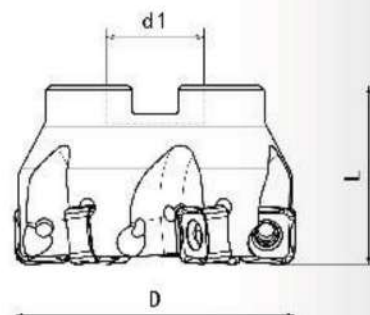
JFM75-SN12





| Designation          | D   | d1 | L  | ap(max) | Z  | Insert                       |  |
|----------------------|-----|----|----|---------|----|------------------------------|--|
| JFM75-450-22R-SN12   | 50  | 22 | 40 | 8.0     | 4  | SN_X 1205ENN<br>SN_X 1205... |  |
| JFM75-563-22R-SN12   | 63  | 22 | 40 | 8.0     | 5  |                              |  |
| JFM75-780-27R-SN12   | 80  | 27 | 50 | 8.0     | 7  |                              |  |
| JFM75-8100-32R-SN12  | 100 | 32 | 50 | 8.0     | 8  |                              |  |
| JFM75-10125-40R-SN12 | 125 | 40 | 63 | 8.0     | 10 |                              |  |
| JFM75-10160-40R-SN12 | 160 | 40 | 63 | 8.0     | 10 |                              |  |
|                      |     |    |    |         |    |                              |  |
|                      |     |    |    |         |    |                              |  |
|                      |     |    |    |         |    |                              |  |
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|                      |     |    |    |         |    |                              |  |
|                      |     |    |    |         |    |                              |  |

| Dimension | Components  |  |         |
|-----------|---|--|---------|
| Diameter  | Screw type  | Spanner type   | Torsion |
| D50-160   | <br>JS050120 | <br>T20 | 5.0Nm   |

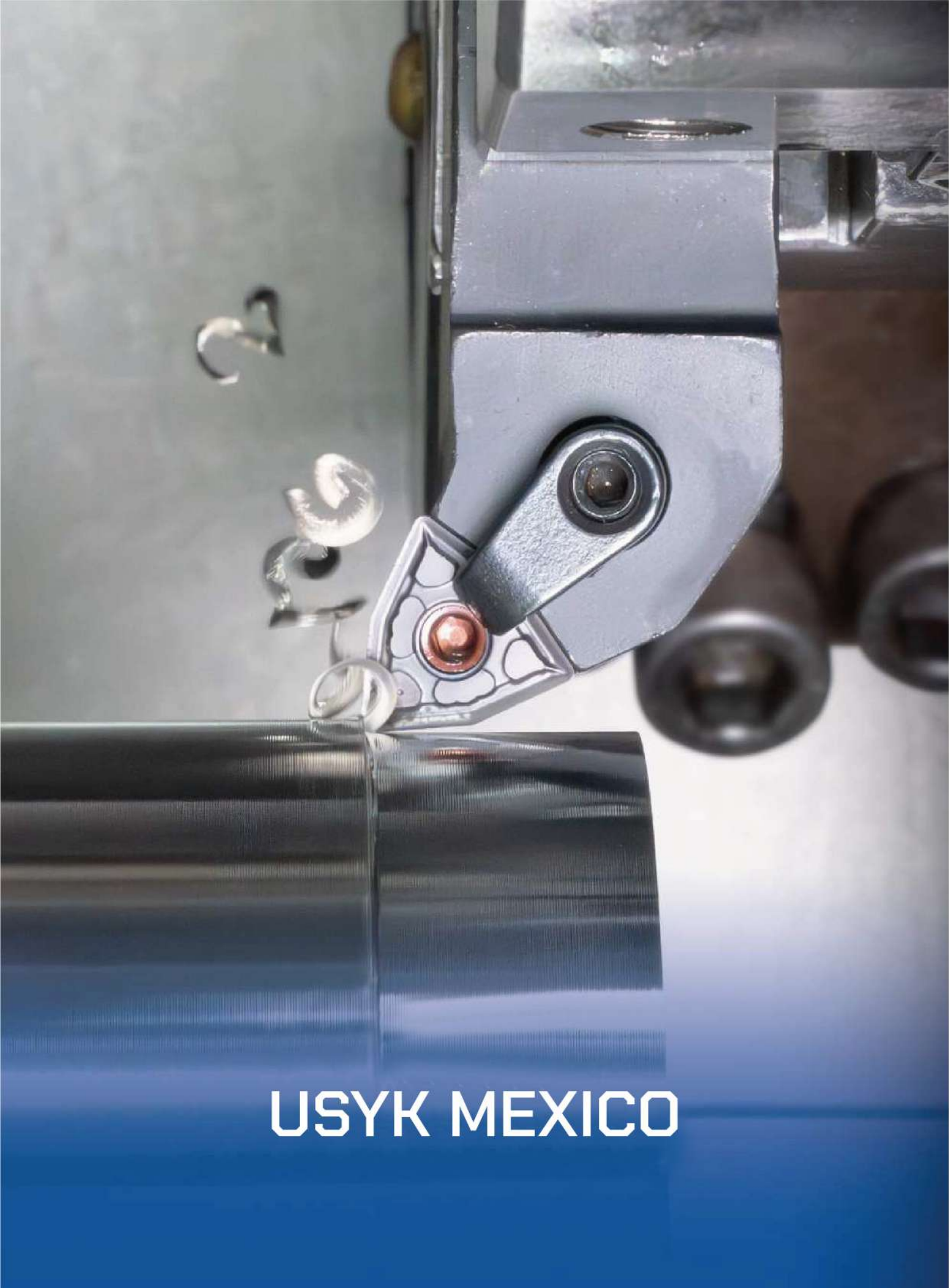
JFM88-SN12



| Designation          | D   | d1 | L  | ap(max) | Z  | Insert                       |  |
|----------------------|-----|----|----|---------|----|------------------------------|--|
| JFM88-450-22R-SN12   | 50  | 22 | 40 | 10.0    | 4  | SN_X 1205ZNN<br>SN_X 1205... |  |
| JFM88-463-22R-SN12   | 63  | 22 | 40 | 10.0    | 4  |                              |  |
| JFM88-663-22R-SN12   | 63  | 22 | 40 | 10.0    | 6  |                              |  |
| JFM88-580-27R-SN12   | 80  | 27 | 50 | 10.0    | 5  |                              |  |
| JFM88-780-27R-SN12   | 80  | 27 | 50 | 10.0    | 7  |                              |  |
| JFM88-8100-32R-SN12  | 100 | 32 | 50 | 10.0    | 8  |                              |  |
| JFM88-10100-32R-SN12 | 100 | 32 | 50 | 10.0    | 10 |                              |  |
| JFM88-10125-40R-SN12 | 125 | 40 | 63 | 10.0    | 10 |                              |  |
| JFM88-13125-40R-SN12 | 125 | 40 | 63 | 10.0    | 13 |                              |  |
| JFM88-12160-40R-SN12 | 160 | 40 | 63 | 10.0    | 12 |                              |  |
|                      |     |    |    |         |    |                              |  |
|                      |     |    |    |         |    |                              |  |
|                      |     |    |    |         |    |                              |  |
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|                      |     |    |    |         |    |                              |  |
|                      |     |    |    |         |    |                              |  |

| Dimension | Components  |  |         |
|-----------|---|--|---------|
| Diameter  | Screw type  | Spanner type   | Torsion |
| D50-160   | <br>JS050120 | <br>T20 | 5.0Nm   |





**USYK MEXICO**

# CONTENTS

## Turning Inserts

|   |     |
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| Positive 35°Rhombic Inserts .....       | T25 |

Turning Insert Designation System

**C** **N** **M** **G** **Space**

1 2 3 4

**1 - Shape**

|                  |                    |                 |                 |                  |
|------------------|--------------------|-----------------|-----------------|------------------|
| <b>A</b><br>85°  | <b>B</b><br>82°    | <b>C</b><br>80° | <b>D</b><br>55° | <b>E</b><br>75°  |
| <b>H</b><br>120° | <b>K</b><br>55°    | <b>L</b><br>90° | <b>M</b><br>86° | <b>O</b><br>135° |
| <b>P</b><br>108° | <b>R</b><br>360°   | <b>S</b><br>90° | <b>T</b><br>60° | <b>V</b><br>35°  |
| <b>W</b><br>80°  | <b>Z</b><br>others |                 |                 |                  |

**2 - Insert clearance angle**

|                 |                    |                 |                 |
|-----------------|--------------------|-----------------|-----------------|
| <b>A</b><br>3°  | <b>B</b><br>5°     | <b>C</b><br>7°  | <b>D</b><br>15° |
| <b>E</b><br>20° | <b>F</b><br>25°    | <b>G</b><br>30° | <b>N</b><br>0°  |
| <b>P</b><br>11° | <b>O</b><br>others |                 |                 |

**3 - Tolerance**

Shape: C, E, H, M, O, P, S, T, R, W

| IC     | d         |        | m      |        |
|--------|-----------|--------|--------|--------|
|        | J,K,L,M,N | U      | M, N   | U      |
| 4.76   | ± 0.05    | ± 0.08 | ± 0.08 | ± 0.13 |
| 5.56   | ± 0.05    | ± 0.08 | ± 0.08 | ± 0.13 |
| 6      | ± 0.05    | ± 0.08 | ± 0.08 | ± 0.13 |
| 6.35   | ± 0.05    | ± 0.08 | ± 0.08 | ± 0.13 |
| 7.94   | ± 0.05    | ± 0.08 | ± 0.08 | ± 0.13 |
| 8      | ± 0.05    | ± 0.08 | ± 0.08 | ± 0.13 |
| 9.525  | ± 0.05    | ± 0.08 | ± 0.08 | ± 0.13 |
| 10     | ± 0.05    | ± 0.08 | ± 0.08 | ± 0.13 |
| 12     | ± 0.08    | ± 0.13 | ± 0.13 | ± 0.20 |
| 12.7   | ± 0.08    | ± 0.13 | ± 0.13 | ± 0.20 |
| 15.875 | ± 0.10    | ± 0.18 | ± 0.15 | ± 0.27 |
| 16     | ± 0.10    | ± 0.18 | ± 0.15 | ± 0.27 |
| 19.05  | ± 0.10    | ± 0.18 | ± 0.15 | ± 0.27 |
| 20     | ± 0.10    | ± 0.18 | ± 0.15 | ± 0.27 |
| 25     | ± 0.13    | ± 0.25 | ± 0.18 | ± 0.38 |
| 25.4   | ± 0.13    | ± 0.25 | ± 0.18 | ± 0.38 |
| 31.75  | ± 0.15    | ± 0.25 | ± 0.20 | ± 0.38 |
| 32     | ± 0.15    | ± 0.25 | ± 0.20 | ± 0.38 |

| Grade | Unit | d       | m       | s       |
|-------|------|---------|---------|---------|
| A     | mm   | ± 0.025 | ± 0.005 | ± 0.025 |
| C     | mm   | ± 0.025 | ± 0.013 | ± 0.025 |
| E     | mm   | ± 0.025 | ± 0.025 | ± 0.025 |
| F     | mm   | ± 0.013 | ± 0.005 | ± 0.025 |
| G     | mm   | ± 0.025 | ± 0.025 | ± 0.130 |
| H     | mm   | ± 0.013 | ± 0.013 | ± 0.025 |
| J     | mm   | *       | ± 0.005 | ± 0.025 |
| K     | mm   | *       | ± 0.013 | ± 0.025 |
| L     | mm   | *       | ± 0.025 | ± 0.025 |
| M     | mm   | *       | *       | ± 0.127 |
| U     | mm   | *       | *       | ± 0.127 |
| N     | mm   | *       | *       | ± 0.025 |

\* See table at right and below

| M&N grade | D shape |        | V shape |        |
|-----------|---------|--------|---------|--------|
|           | IC      | d      | d       | m      |
| 5.56      | ± 0.05  | ± 0.11 |         |        |
| 6.35      | ± 0.05  | ± 0.11 | ± 0.05  | ± 0.16 |
| 7.94      | ± 0.05  | ± 0.11 | ± 0.05  | ± 0.16 |
| 9.525     | ± 0.05  | ± 0.11 | ± 0.05  | ± 0.16 |
| 12.7      | ± 0.08  | ± 0.15 | ± 0.08  | ± 0.20 |
| 15.875    | ± 0.10  | ± 0.18 | ± 0.10  | ± 0.27 |
| 19.05     | ± 0.10  | ± 0.18 | ± 0.10  | ± 0.27 |

**4 - Type**

|          |          |          |          |          |
|----------|----------|----------|----------|----------|
| <b>A</b> | <b>G</b> | <b>H</b> | <b>M</b> | <b>N</b> |
| <b>Q</b> | <b>T</b> | <b>U</b> | <b>W</b> | <b>X</b> |
|          |          |          |          | others   |

40°-60° 40°-60° 40°-60°

**12** **04** **08** **8** **-** **FS**

5 6 7 8 9

**5 - Cutting edge length**

| Diameter of internal tangent circle (mm) | Insert shape |    |    |    |    |    |    |    |
|--|--------------|----|----|----|----|----|----|----|
|  | C            | D  | R  | S  | T  | V  | W  | K  |
| 3.97                                     |              |    |    |    | 06 |    |    |    |
| 5.0                                      |              |    | 05 |    |    |    |    |    |
| 5.56                                     |              |    |    |    | 09 |    |    |    |
| 6.0                                      |              |    | 06 |    |    |    |    |    |
| 6.35                                     | 06           | 07 |    |    | 11 | 11 |    |    |
| 8.0                                      |              |    | 08 |    |    |    |    |    |
| 9.525                                    | 09           | 11 | 09 | 09 | 16 | 16 | 06 | 16 |
| 10.0                                     |              |    | 10 |    |    |    |    |    |
| 12.0                                     |              |    | 12 |    |    |    |    |    |
| 12.7                                     | 12           | 15 |    | 12 | 22 | 22 | 08 |    |
| 15.875                                   | 16           |    | 15 | 15 | 27 |    |    |    |
| 16.0                                     |              |    | 16 |    |    |    |    |    |
| 19.05                                    | 19           |    | 19 | 19 | 33 |    |    |    |
| 20.0                                     |              |    | 20 |    |    |    |    |    |
| 25.0                                     |              |    | 25 |    |    |    |    |    |
| 25.4                                     | 25           |    | 25 | 25 |    |    |    |    |
| 31.75                                    |              |    |    |    |    |    |    |    |
| 32.0                                     |              |    | 32 |    |    |    |    |    |

**7 - Cutting edge corner**

**Corner radius**

MO = round insert (metric)

|            |            |
|------------|------------|
| 00 = Sharp | 24 = 2.4   |
| 01 = 0.1   | 28 = 2.8   |
| 02 = 0.2   | 31 = 3.1   |
| 04 = 0.4   | 40 = 4.0   |
| 08 = 0.8   | 48 = 4.8   |
| 12 = 1.2   | 56 = 5.6   |
| 16 = 1.6   | 64 = 6.4   |
| 20 = 2.0   | X = Others |

**Wiper corner**

Entering angle(kr) Relief angle(an)

|            |            |
|------------|------------|
| A = 45°    | A = 3°     |
| D = 60°    | B = 5°     |
| E = 75°    | C = 7°     |
| F = 85°    | D = 15°    |
| G = 87°    | E = 20°    |
| P = 90°    | F = 25°    |
| Z = Others | G = 30°    |
|            | N = 0°     |
|            | P = 11°    |
|            | Z = Others |

**6 - Thickness**

Add 0 or T before rounding down

Example :

- 01 = 1.59mm
- T1 = 1.98mm
- 02 = 2.38mm
- 03 = 3.18mm
- T3 = 3.97mm
- 04 = 4.76mm
- 05 = 5.56mm
- 06 = 6.35mm
- 07 = 7.94mm
- 09 = 9.52mm
- 11 = 11.11mm
- 12 = 12.70mm
- 14 = 14.29mm
- 15 = 15.88mm



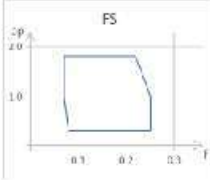

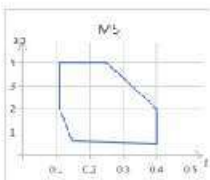

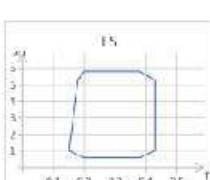

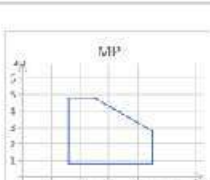
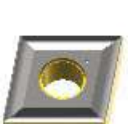
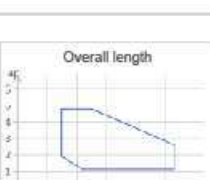

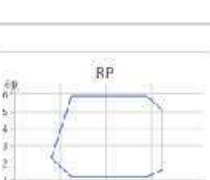


**9 - Information about chip breakers**






































Refer to page T04-T06

**8 - Cutting edge design**

| Names | Photo | Clarification                                      |
|-------|-------|--|
| F     |       | Sharp cutting edge                                 |
| E     |       | Rounded cutting edges                              |
| T     |       | Negative chamfer                                   |
| S     |       | Negative chamfering and filleting of cutting edges |



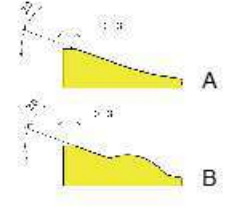
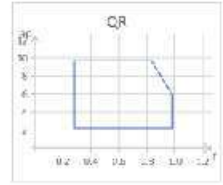

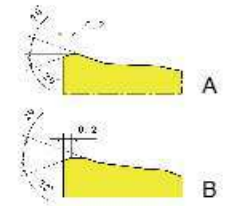


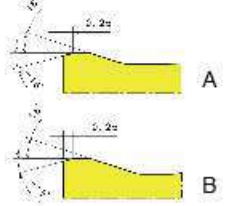
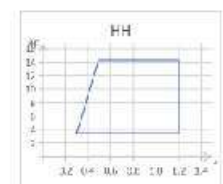
Chipbreaker Of Negative Inserts

| Application       | Chip breaker   | Geometric angle  | Cutting range   | Application and features   |
|-------------------|----------------|---|---|--|
| Finishing         | FS             |                  |    | <ul style="list-style-type: none"> <li>Finishing of exotic materials</li> <li>Positive rake geometry to minimize cutting force</li> <li>Excellent chip control and excellent surface roughness after machining</li> </ul>          |
|                   | MS             |                  |    | <ul style="list-style-type: none"> <li>Semi-finishing of exotic materials, stainless steel</li> <li>Double rake geometry, sharp cutting edge and low cutting force</li> </ul>  |
| Medium processing | ES             |                  |   | <ul style="list-style-type: none"> <li>Medium machining stainless steel, high temperature alloys, mild steel</li> <li>For general machining, low cutting force</li> </ul>  |
|                   | MP             |                |  | <ul style="list-style-type: none"> <li>Medium machining of steel</li> <li>Excellent chip control and evacuation due to the specially designed chip breaker geometry</li> <li>Double rake geometry and low cutting force</li> </ul> |
|                   | Overall length |                |  | <ul style="list-style-type: none"> <li>Medium machining of cast iron, carbon steel and alloy steel</li> <li>Strong cutting edge</li> </ul>   |
| Roughing          | RP             |                |  | <ul style="list-style-type: none"> <li>Roughing of steel</li> <li>Excellent chip control due to the specially designed chipbreaker geometry for small depth machining</li> <li>Strong cutting, stable rough machining</li> </ul>   |
|                   | Flatbed        |                |  | <ul style="list-style-type: none"> <li>Roughing of cast iron</li> <li>For interrupt and unstable machining applications</li> </ul>   |



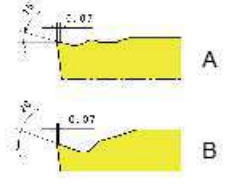
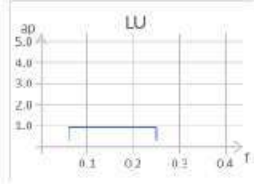
|                      |                      |                      |                      |                      |                      |
|---|---|---|---|---|---|
| CNMG-FS<br><br>T10   | DNMG-FS<br><br>T13   | SNMG-FS<br><br>T15   | TNMG-FS<br><br>T18   | VNMG-FS<br><br>T19   | WNMG-FS<br><br>T20   |
| CNMG-MS<br><br>T10   | DNMG-MS<br><br>T13   | SNMG-MS<br><br>T15   | TNMG-MS<br><br>T18   | VNMG-MS<br><br>T19   | WNMG-MS<br><br>T20   |
| CNMG-ES<br><br>T10   | DNMG-ES<br><br>T13   | SNMG-ES<br><br>T15   | TNMG-ES<br><br>T18   | VNMG-ES<br><br>T19   | WNMG-ES<br><br>T20   |
| CNMG-MP<br><br>T10 | DNMG-MP<br><br>T13 | SNMG-MP<br><br>T15 | TNMG-MP<br><br>T18 | VNMG-MP<br><br>T19 | WNMG-MP<br><br>T20 |
| CNMG-<br><br>T10   | DNMG-<br><br>T14   | SNMG-<br><br>T15   | TNMG-<br><br>T18   | VNMG-<br><br>T19   | WNMG-<br><br>T20   |
| CNMG-RP<br><br>T11 | DNMG-RP<br><br>T14 | SNMG-RP<br><br>T16 |   |   | WNMG-RP<br><br>T20 |
| CNMA<br><br>T11    | DNMA<br><br>T14    | SNMA<br><br>T16    | TNMA<br><br>T18    |   | WNMA<br><br>T20    |


















Chipbreaker Of Negative Inserts

| Application    | Chip breaker  | Geometric angle  | Cutting range  | Application and features   |
|----------------|---|---|--|--|
| Heavy roughing | QR   |                  |   | <ul style="list-style-type: none"> <li>• Heavy roughing of steel, stainless steel and cast iron</li> <li>• Positive rake geometry credit to low cutting force</li> <li>• For low horse power machines and slender workpiece machining</li> </ul> |
|                | HR   |                  |   | <ul style="list-style-type: none"> <li>• Heavy roughing of steel</li> <li>• Wide groove and several dimples for high feed</li> <li>• Low cutting force and excellent chip control due to wave cutting edge</li> </ul>                            |
|                | HH  |                 |  | <ul style="list-style-type: none"> <li>• Heavy roughing of steel</li> <li>• Large land angle and straight cutting edge</li> <li>• For large depth of cut and high feed machining of big dimension ring workpiece</li> </ul>                      |

Chipbreaker Of Positive Inserts

| Application | Chip breaker   | Geometric angle  | Cutting range   | Application features  |
|-------------|--|---|---|---|
| Finishing   | LU  |                  |  | <ul style="list-style-type: none"> <li>• For finishing semi-finishing of high temperature alloys, stainless steel, steel</li> <li>• Low cutting force, good chip control</li> </ul> |

|                     |  |                     |  |  |  |
|--|---|--|---|---|---|
| CNMM-QR<br><br>T11  |   | SNMM-QR<br><br>T16  |   |   |   |
| CNMM-HR<br><br>T12  |   | SNMM-HR<br><br>T16  |   |   |   |
| CNMM-HH<br><br>T12 |   | SNMM-HH<br><br>T17 |   |   |   |

|                    |                    |                    |                    |                    |  |
|---|---|---|---|---|---|
| CCMT-LU<br><br>T21 | DCMT-LU<br><br>T22 | SCMT-LU<br><br>T23 | TCMT-LU<br><br>T24 | VCMT-LU<br><br>T25 |   |

ISO Application Range

| ISO application range of Turning insert grades |                                |     |            |        |        |        |        |            |        |        |        |        |        |  |
|--|--------------------------------|-----|------------|--------|--------|--------|--------|------------|--------|--------|--------|--------|--------|--|
| Material Group                                 | Materials                      | ISO | PVD coated |        |        |        |        | CVD coated |        |        |        |        |        |  |
|  |                                |     | WT5015     | WT5025 | WT5030 | WT5035 | WT3310 | WT3330     | WT8010 | WT8020 | WT8030 | WT4015 | WT4020 |  |
| P  | Unalloyed steel, alloyed steel | P01 |            |        |        |        |        |            |        |        |        |        |        |  |
|  |                                | P05 | WT5015     |        |        |        |        |            | WT8010 |        |        |        |        |  |
|  |                                | P10 |            |        |        |        |        |            |        | WT8020 |        |        |        |  |
|  |                                | P15 |            |        |        |        |        |            |        |        | WT8030 |        |        |  |
|  |                                | P20 |            |        |        |        |        |            |        |        |        |        |        |  |
|  |                                | P25 |            |        |        |        |        |            |        |        |        |        |        |  |
|  |                                | P30 |            |        |        |        |        |            |        |        |        |        |        |  |
|  |                                | P35 |            |        |        | WT5035 |        |            |        |        |        |        |        |  |
|  |                                | P40 |            |        |        |        |        |            |        |        |        |        |        |  |
|  |                                | P45 |            |        |        |        |        |            |        |        |        |        |        |  |
| P50  |                                |     |            |        |        |        |        |            |        |        |        |        |        |  |
| M  | Stainless steel                | M01 |            |        |        |        |        |            |        |        |        |        |        |  |
|  |                                | M05 | WT5015     |        |        |        |        |            |        |        |        |        |        |  |
|  |                                | M10 |            |        |        |        |        |            |        |        |        |        |        |  |
|  |                                | M15 |            |        |        |        |        |            |        |        |        |        |        |  |
|  |                                | M20 |            |        |        |        |        |            |        |        |        |        |        |  |
|  |                                | M25 |            | WT5025 |        |        |        |            |        |        |        |        |        |  |
|  |                                | M30 |            |        | WT5030 |        |        |            |        |        |        |        |        |  |
|  |                                | M35 |            |        |        | WT5035 |        |            |        |        |        |        |        |  |
|  |                                | M40 |            |        |        |        |        |            |        |        |        |        |        |  |
|  |                                | M45 |            |        |        |        |        |            |        |        |        |        |        |  |
| K  | Cast iron                      | K01 |            |        |        |        |        |            |        |        |        |        |        |  |
|  |                                | K05 |            |        |        |        |        |            |        |        |        |        |        |  |
|  |                                | K10 |            |        |        |        |        |            |        |        |        |        |        |  |
|  |                                | K15 |            |        |        |        |        |            |        |        |        |        |        |  |
|  |                                | K20 |            |        |        |        |        |            |        |        |        |        |        |  |
|  |                                | K25 |            |        |        |        |        |            |        |        |        |        |        |  |
|  |                                | K30 |            |        |        |        |        |            |        |        |        |        |        |  |
|  |                                | K35 |            |        |        |        |        |            |        |        |        |        |        |  |
|  |                                | K40 |            |        |        |        |        |            |        |        |        |        |        |  |
|  |                                | K45 |            |        |        |        |        |            |        |        |        |        |        |  |
| S  | High temperature alloy         | S01 |            |        |        |        |        |            |        |        |        |        |        |  |
|  |                                | S05 | WT5015     |        |        |        |        |            |        |        |        |        |        |  |
|  |                                | S10 |            |        |        |        |        |            |        |        |        |        |        |  |
|  |                                | S15 |            |        |        |        |        |            |        |        |        |        |        |  |
|  |                                | S20 |            |        |        |        |        |            |        |        |        |        |        |  |
|  |                                | S25 |            |        |        |        |        |            |        |        |        |        |        |  |
|  |                                | S30 |            | WT5025 |        |        |        |            |        |        |        |        |        |  |
|  |                                | S35 |            |        | WT5030 |        |        |            |        |        |        |        |        |  |
|  |                                | S40 |            |        |        |        |        |            |        |        |        |        |        |  |
|  |                                | S45 |            |        |        |        |        |            |        |        |        |        |        |  |
| N  | Non-ferrous alloy              | N01 |            |        |        |        |        |            |        |        |        |        |        |  |
|  |                                | N05 |            |        |        |        |        |            |        |        |        |        |        |  |
|  |                                | N10 |            |        |        |        |        |            |        |        |        |        |        |  |
|  |                                | N15 |            |        |        |        |        |            |        |        |        |        |        |  |
|  |                                | N20 |            |        |        |        |        |            |        |        |        |        |        |  |
|  |                                | N25 |            |        |        |        |        |            |        |        |        |        |        |  |
|  |                                | N30 |            |        |        |        |        |            |        |        |        |        |        |  |
| H  | Hardened steel, cold cast iron | H01 |            |        |        |        |        |            |        |        |        |        |        |  |
|  |                                | H05 |            |        |        |        |        |            |        |        |        |        |        |  |
|  |                                | H10 |            |        |        |        |        |            |        |        |        |        |        |  |
|  |                                | H15 |            |        |        |        |        |            |        |        |        |        |        |  |
|  |                                | H20 |            |        |        |        |        |            |        |        |        |        |        |  |
|  |                                | H25 |            |        |        |        |        |            |        |        |        |        |        |  |
|  |                                | H30 |            |        |        |        |        |            |        |        |        |        |        |  |

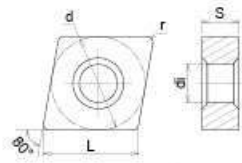
PVD Coated Carbide Grades

| Grade  | Appearance    | Range   | Characteristics & applications   |
|--------|---------------|---------|--|
| WT5015 | Black brown   | M05-M20 | • Submicron substrate  |
|        |               | S05-S20 | • For stable machining of stainless steel                                    |
|        |               | P05-P20 | • For finishing of high temperature alloy and hardened steel                 |
| WT5025 | Black brown   | M15-M35 | • Submicron substrate  |
|        |               | S15-S35 | • For general machining of stainless steel and high temperature alloy        |
| WT5030 | Golden yellow | M15-M40 | • Submicron substrate  |
|        |               | S15-S40 | • For general stable machining of stainless steel and high temperature alloy |
| WT5035 | Grey black    | M25-M45 | • Tough carbide substrate and excellent toughness                            |
|        |               | P25-P45 | • For roughing of stainless steel and steel                                  |
| WT3310 | Bronze        | S05-S20 | • Submicron substrate and excellent wear resistance                          |
|        |               | M05-M20 | • For finishing of high temperature alloy and stainless steel                |
| WT3330 | Bronze        | S15-S35 | • Submicron substrate and good wear resistance                               |
|        |               | M15-M35 | • For general machining of high temperature alloy and stainless steel        |

CVD Coated Carbide Grades

| Grade  | Appearance   | Range   | Characteristics & applications  |
|--------|--------------|---------|---|
| WT8010 | Two-coloured | P05-P15 | • Tough substrate for steel machining<br>• For high speed and continuous cutting application                      |
| WT8020 | Two-coloured | P10-P25 | • Tough substrate for steel machining<br>• For light interrupted cutting application                              |
| WT8030 | Two-coloured | P15-P35 | • Tough substrate for steel machining<br>• For general machining application                                      |
| WT4015 | Two-coloured | K10-K30 | • Tough carbide substrate for cast iron machining<br>• For high speed turning of gray cast iron                   |
| WT4020 | Two-coloured | K15-K35 | • Tough carbide substrate for gray & ductile cast iron and alloy cast iron<br>• For general machining application |

Negative 80° Rhombic Inserts



| Dimension(mm) |       |      |      |      |
|---------------|-------|------|------|------|
| Type          | d     | L    | S    | di   |
| CN_1204_      | 12.7  | 12.9 | 4.76 | 5.16 |
| CN_1606_      | 15.87 | 16.1 | 6.35 | 6.35 |
| CN_1906_      | 19.05 | 19.3 | 6.35 | 7.94 |

| Insert            | Designation | Cutting parameter |           | Grade     |        |        |        |        |        |        |        |        |        |        |   |
|-------------------|-------------|-------------------|-----------|-----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---|
|                   |             | f (mm/rev)        | ap (mm)   | WT8010    | WT8020 | WT8030 | WT5015 | WT5025 | WT5030 | WT5035 | WT4015 | WT4020 | WT3310 | WT3330 |   |
| Finishing         | CNMG        | 120404-FS         | 0.05-0.15 | 0.50-1.50 |        |        |        | ▲      | △      |        |        |        |        | ▲      | ▲ |
|                   |             | 120408-FS         | 0.10-0.30 | 0.70-1.50 |        |        |        | ▲      | ▲      | △      |        |        |        | ▲      | ▲ |
| Semi-finishing    | CNMG        | 120404-MS         | 0.10-0.25 | 0.80-3.50 |        |        |        | ▲      | ▲      | △      |        |        |        | △      | △ |
|                   |             | 120408-MS         | 0.10-0.30 | 1.00-3.50 |        |        |        | ▲      | ▲      | △      | △      |        |        | △      | △ |
|                   |             | 120412-MS         | 0.15-0.30 | 1.30-3.50 |        |        |        | ▲      | ▲      | △      | △      |        |        | △      | △ |
| Medium processing | CNMG        | 120404-ES         | 0.08-0.20 | 0.40-4.50 |        |        |        | ▲      | ▲      | △      | △      |        |        | ▲      | ▲ |
|                   |             | 120408-ES         | 0.15-0.40 | 0.80-4.50 |        |        |        | ▲      | ▲      | △      | △      |        |        | ▲      | ▲ |
|                   |             | 120412-ES         | 0.20-0.50 | 1.20-4.50 |        |        |        | ▲      | ▲      | △      | △      |        |        | ▲      | ▲ |
|                   |             | 160612-ES         | 0.20-0.50 | 1.20-5.50 |        |        |        |        | ▲      |        | △      |        |        |        |   |
|                   |             | 160616-ES         | 0.30-0.60 | 1.60-5.50 |        |        |        |        | ▲      |        | △      |        |        |        |   |
|                   |             | 190612-ES         | 0.20-0.50 | 1.20-6.50 |        |        |        |        | ▲      |        |        |        |        |        |   |
|                   |             | 190616-ES         | 0.30-0.60 | 1.60-6.50 |        |        |        |        |        |        |        |        |        |        |   |
| Medium processing | CNMG        | 120404-MP         | 0.08-0.20 | 0.40-4.50 | ▲      |        | ▲      |        |        |        |        |        |        |        |   |
|                   |             | 120408-MP         | 0.15-0.40 | 0.80-4.50 | ▲      | ▲      | ▲      |        |        |        |        |        |        |        |   |
|                   |             | 120412-MP         | 0.20-0.50 | 1.20-4.50 | ▲      | ▲      | ▲      |        |        |        |        |        |        |        |   |
|                   |             | 160608-MP         | 0.15-0.40 | 0.80-5.50 | ▲      |        | ▲      |        |        |        |        |        |        |        |   |
|                   |             | 160612-MP         | 0.20-0.50 | 1.20-5.50 | ▲      |        | ▲      |        |        |        |        |        |        |        |   |
|                   |             | 190608-MP         | 0.15-0.40 | 0.80-6.50 | ▲      |        | ▲      |        |        |        |        |        |        |        |   |
| Medium processing | CNMG        | 120404            | 0.08-0.20 | 0.40-4.50 |        |        |        |        |        |        |        |        | ▲      | ▲      |   |
|                   |             | 120408            | 0.15-0.40 | 0.80-4.50 |        |        |        |        |        |        |        |        | ▲      | ▲      |   |
|                   |             | 120412            | 0.20-0.50 | 1.20-4.50 |        |        |        |        |        |        |        |        | ▲      | ▲      |   |
|                   |             | 160612            | 0.20-0.50 | 1.20-5.50 |        |        |        |        |        |        |        |        | ▲      | △      |   |
|                   |             | 160616            | 0.30-0.60 | 1.60-5.50 |        |        |        |        |        |        |        |        | ▲      | △      |   |
|                   |             | 190612            | 0.20-0.50 | 0.80-6.50 |        |        |        |        |        |        |        |        | ▲      | △      |   |

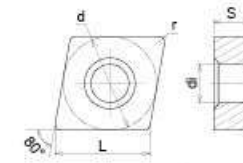
|   |                         |
|---|-------------------------|
| P | Steel                   |
| M | Stainless steel         |
| K | Cast iron               |
| N | Non-ferrous alloys      |
| S | High temperature alloys |
| H | Hardened steel          |

Processing conditions

- Stable cutting
- General cutting
- ✘ Unstable cutting

△ General stock ▲ Regular stock

Negative 80° Rhombic Inserts



| Dimension(mm) |       |      |      |      |
|---------------|-------|------|------|------|
| Type          | d     | L    | S    | di   |
| CN_1204_      | 12.7  | 12.9 | 4.76 | 5.16 |
| CN_1606_      | 15.87 | 16.1 | 6.35 | 6.35 |
| CN_1906_      | 19.05 | 19.3 | 6.35 | 7.94 |
| CN_2507_      | 25.4  | 25.8 | 7.94 | 9.12 |
| CN_2509_      | 25.4  | 25.8 | 9.53 | 9.12 |

| Insert         | Designation | Cutting parameter |           | Grade      |           |           |        |        |        |        |        |        |        |        |   |  |  |
|----------------|-------------|-------------------|-----------|------------|-----------|-----------|--------|--------|--------|--------|--------|--------|--------|--------|---|--|--|
|                |             | f (mm/rev)        | ap (mm)   | WT8010     | WT8020    | WT8030    | WT5015 | WT5025 | WT5030 | WT5035 | WT4015 | WT4020 | WT3310 | WT3330 |   |  |  |
| Finishing      | CNMG        | 120408-RP         | 0.20-0.60 | 1.20-6.00  | ▲         | △         | ▲      |        |        |        |        |        |        |        |   |  |  |
|                |             | 120412-RP         | 0.30-0.70 | 1.80-6.00  | ▲         | △         | ▲      |        |        |        |        |        |        |        |   |  |  |
|                |             | 160612-RP         | 0.30-0.70 | 1.80-7.00  | ▲         |           | ▲      |        |        |        |        |        |        |        |   |  |  |
|                |             | 160616-RP         | 0.40-0.85 | 2.40-7.00  | ▲         |           | ▲      |        |        |        |        |        |        |        |   |  |  |
|                |             | 160624-RP         | 0.60-1.00 | 3.60-7.00  | ▲         |           | ▲      |        |        |        |        |        |        |        |   |  |  |
|                |             | 190612-RP         | 0.30-0.70 | 1.80-9.00  | ▲         | △         | ▲      |        |        |        |        |        |        |        |   |  |  |
| Semi-finishing | CNMG        | 190616-RP         | 0.40-0.85 | 2.40-9.00  | ▲         | △         | ▲      |        |        |        |        |        |        |        |   |  |  |
|                |             |                   |           |            |           |           |        |        |        |        |        |        |        |        |   |  |  |
| Roughing       | CNMA        | 120404            | 0.10-0.30 | 0.60-6.00  |           |           |        |        |        |        |        |        |        | ▲      |   |  |  |
|                |             | 120408            | 0.20-0.60 | 1.20-6.00  |           |           |        |        |        |        |        |        |        | ▲      | △ |  |  |
|                |             | 120412            | 0.30-0.70 | 1.80-6.00  |           |           |        |        |        |        |        |        |        | ▲      | △ |  |  |
|                |             | 120416            | 0.40-0.85 | 2.40-6.00  |           |           |        |        |        |        |        |        |        | ▲      |   |  |  |
|                |             | 160608            | 0.20-0.60 | 1.20-7.00  |           |           |        |        |        |        |        |        |        | ▲      |   |  |  |
|                |             | 160612            | 0.30-0.70 | 1.80-7.00  |           |           |        |        |        |        |        |        |        | ▲      |   |  |  |
|                |             | 160616            | 0.40-0.85 | 2.40-7.00  |           |           |        |        |        |        |        |        |        | ▲      |   |  |  |
|                |             | 160620            | 0.50-0.95 | 3.00-7.00  |           |           |        |        |        |        |        |        |        | ▲      |   |  |  |
|                |             | 190608            | 0.20-0.60 | 1.20-9.00  |           |           |        |        |        |        |        |        |        | ▲      |   |  |  |
|                |             | 190612            | 0.30-0.70 | 1.80-9.00  |           |           |        |        |        |        |        |        |        | ▲      |   |  |  |
|                |             | 190616            | 0.40-0.85 | 2.40-9.00  |           |           |        |        |        |        |        |        |        | ▲      |   |  |  |
|                |             | Heavy roughing    | CNMM      | 190612-QR  | 0.25-0.50 | 2.20-7.70 | ▲      |        | △      |        |        |        |        |        |   |  |  |
|                |             |                   |           | 190616-QR  | 0.30-0.60 | 3.00-7.70 | ▲      | △      | ▲      |        |        |        |        |        |   |  |  |
| 190624-QR      | 0.50-1.00   |                   |           | 4.50-7.70  | △         | △         | ▲      |        |        |        |        |        |        |        |   |  |  |
| 250724-QR      | 0.50-1.00   |                   |           | 5.00-10.50 |           |           | △      |        |        |        |        |        |        |        |   |  |  |
| 250924-QR      | 0.50-1.00   |                   |           | 5.00-10.50 | △         | △         | ▲      |        |        |        |        |        |        |        |   |  |  |

|   |                         |
|---|-------------------------|
| P | Steel                   |
| M | Stainless steel         |
| K | Cast iron               |
| N | Non-ferrous alloys      |
| S | High temperature alloys |
| H | Hardened steel          |

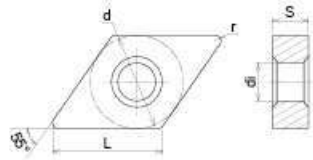
Processing conditions

- Stable cutting
- General cutting
- ✘ Unstable cutting

△ General stock ▲ Regular stock



Negative 55° Rhombic Inserts



| Dimension(mm) |      |      |      |      |
|---------------|------|------|------|------|
| Type          | d    | L    | S    | di   |
| DN_1504_      | 12.7 | 15.5 | 4.76 | 5.16 |
| DN_1506_      | 12.7 | 15.5 | 6.35 | 5.16 |

| Insert            | Designation | Cutting parameter |           | Grade     |        |        |        |        |        |        |        |        |        |        |  |
|-------------------|-------------|-------------------|-----------|-----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--|
|                   |             | f (mm/rev)        | ap (mm)   | WT8010    | WT8020 | WT8030 | WT5015 | WT5025 | WT5030 | WT5035 | WT4015 | WT4020 | WT3310 | WT3330 |  |
| Medium processing | DNMG        | 150404            | 0.08-0.20 | 0.40-4.00 |        |        |        |        |        |        |        | △      | ▲      |        |  |
|                   |             | 150408            | 0.15-0.40 | 0.80-4.00 |        |        |        |        |        |        |        | ▲      | ▲      |        |  |
|                   |             | 150412            | 0.25-0.50 | 1.20-4.00 |        |        |        |        |        |        |        | ▲      | △      |        |  |
|                   |             | 150604            | 0.08-0.20 | 0.40-4.00 |        |        |        |        |        |        |        | △      | ▲      |        |  |
|                   |             | 150608            | 0.15-0.40 | 0.80-4.00 |        |        |        |        |        |        |        | ▲      | ▲      |        |  |
|                   |             | 150612            | 0.25-0.50 | 1.20-4.00 |        |        |        |        |        |        |        | ▲      | △      |        |  |
| Roughing          | DNMG        | 150408-RP         | 0.20-0.60 | 1.20-4.00 | ▲      | △      | ▲      |        |        |        |        |        |        |        |  |
|                   |             | 150412-RP         | 0.30-0.90 | 1.80-4.00 | ▲      | △      | ▲      |        |        |        |        |        |        |        |  |
|                   |             | 150416-RP         | 0.40-1.20 | 2.40-4.00 | △      |        | ▲      |        |        |        |        |        |        |        |  |
|                   |             | 150608-RP         | 0.20-0.60 | 1.20-4.00 | ▲      | △      | ▲      |        |        |        |        |        |        |        |  |
|                   |             | 150612-RP         | 0.30-0.90 | 1.80-4.00 | ▲      | △      | ▲      |        |        |        |        |        |        |        |  |
|                   |             | 150616-RP         | 0.40-1.20 | 2.40-4.50 | △      |        | ▲      |        |        |        |        |        |        |        |  |
| Medium processing | DNMA        | 150404            | 0.10-0.30 | 0.60-5.50 |        |        |        |        |        |        |        | △      |        |        |  |
|                   |             | 150408            | 0.20-0.60 | 1.20-5.50 |        |        |        |        |        |        |        | ▲      | △      |        |  |
|                   |             | 150412            | 0.30-0.90 | 1.80-5.50 |        |        |        |        |        |        |        | ▲      |        |        |  |
|                   |             | 150604            | 0.10-0.30 | 0.60-5.50 |        |        |        |        |        |        |        | △      |        |        |  |
|                   |             | 150608            | 0.20-0.60 | 1.20-5.50 |        |        |        |        |        |        |        | ▲      | △      |        |  |
|                   |             | 150612            | 0.30-0.90 | 1.80-5.50 |        |        |        |        |        |        |        | ▲      |        |        |  |

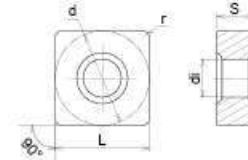
|   |                         |
|---|-------------------------|
| P | Steel                   |
| M | Stainless steel         |
| K | Cast Iron               |
| N | Non-ferrous alloys      |
| S | High temperature alloys |
| H | Hardened steel          |

Processing conditions

- Stable cutting
- General cutting
- ✘ Unstable cutting

△ General stock ▲ Regular stock

Negative Square Inserts



| Dimension(mm) |       |       |      |      |
|---------------|-------|-------|------|------|
| Type          | d     | L     | S    | di   |
| SN_1204_      | 12.7  | 12.7  | 4.76 | 5.16 |
| SN_1506_      | 15.87 | 15.87 | 6.35 | 6.35 |
| SN_1906_      | 19.05 | 19.05 | 6.35 | 7.94 |

| Insert            | Designation | Cutting parameter |           | Grade     |        |        |        |        |        |        |        |        |        |        |   |   |
|-------------------|-------------|-------------------|-----------|-----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---|---|
|                   |             | f (mm/rev)        | ap (mm)   | WT8010    | WT8020 | WT8030 | WT5015 | WT5025 | WT5030 | WT5035 | WT4015 | WT4020 | WT3310 | WT3330 |   |   |
| Finishing         | SNMG        | 120404-FS         | 0.05-0.15 | 0.25-2.50 |        |        |        | ▲      |        |        |        |        |        |        | ▲ |   |
|                   |             | 120408-FS         | 0.10-0.30 | 0.50-2.50 |        |        |        | ▲      | △      |        |        |        |        |        | ▲ | ▲ |
| Semi-finishing    | SNMG        | 120404-MS         | 0.06-0.20 | 0.50-3.50 |        |        |        | ▲      | ▲      |        |        |        |        |        | ▲ | ▲ |
|                   |             | 120408-MS         | 0.10-0.35 | 0.60-3.50 |        |        |        | ▲      | ▲      | △      |        |        |        |        | ▲ | ▲ |
|                   |             | 120412-MS         | 0.12-0.40 | 0.80-3.50 |        |        |        | ▲      | ▲      | △      |        |        |        |        | ▲ | ▲ |
|                   |             | 120416-MS         | 0.15-0.45 | 1.00-3.50 |        |        |        |        |        | △      |        |        |        |        |   |   |
|                   |             | 150612-MS         | 0.12-0.40 | 0.60-4.00 |        |        |        |        |        | △      | ▲      |        |        |        |   | ▲ |
|                   |             | 150616-MS         | 0.15-0.45 | 0.80-4.00 |        |        |        |        |        | △      | ▲      |        |        |        |   | ▲ |
| Medium processing | SNMG        | 120408-ES         | 0.13-0.40 | 0.80-4.50 |        |        |        |        |        |        | ▲      | △      |        |        | ▲ | ▲ |
|                   |             | 120412-ES         | 0.15-0.55 | 1.20-4.50 |        |        |        |        |        |        | ▲      | ▲      | △      |        | ▲ | ▲ |
|                   |             | 150612-ES         | 0.15-0.55 | 1.20-5.50 |        |        |        |        |        |        |        | ▲      | ▲      |        |   |   |
|                   |             | 150616-ES         | 0.20-0.60 | 1.60-5.50 |        |        |        |        |        |        |        |        | ▲      |        |   |   |
|                   |             | 190612-ES         | 0.15-0.55 | 1.20-6.50 |        |        |        |        |        |        |        |        | ▲      | ▲      |   |   |
| Medium processing | SNMG        | 120404-MP         | 0.08-0.25 | 0.40-4.00 | △      |        | ▲      |        |        |        |        |        |        |        |   |   |
|                   |             | 120408-MP         | 0.13-0.40 | 0.80-4.00 | △      | △      | ▲      |        |        |        |        |        |        |        |   |   |
|                   |             | 120412-MP         | 0.15-0.55 | 1.20-4.00 | ▲      | △      | ▲      |        |        |        |        |        |        |        |   |   |
|                   |             | 150608-MP         | 0.13-0.40 | 1.20-5.50 | ▲      |        | ▲      |        |        |        |        |        |        |        |   |   |
| Medium processing | SNMG        | 120404            | 0.08-0.25 | 0.40-4.50 |        |        |        |        |        |        |        |        |        |        | ▲ |   |
|                   |             | 120408            | 0.13-0.40 | 0.80-4.50 |        |        |        |        |        |        |        |        | ▲      | ▲      |   |   |
|                   |             | 120412            | 0.15-0.55 | 1.20-4.50 |        |        |        |        |        |        |        |        | ▲      | ▲      |   |   |

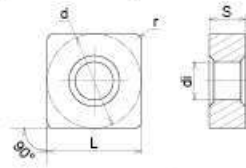
|   |                         |
|---|-------------------------|
| P | Steel                   |
| M | Stainless steel         |
| K | Cast Iron               |
| N | Non-ferrous alloys      |
| S | High temperature alloys |
| H | Hardened steel          |

Processing conditions

- Stable cutting
- General cutting
- ✘ Unstable cutting

△ General stock ▲ Regular stock

Negative Square Inserts



| Dimension(mm) |       |       |      |      |
|---------------|-------|-------|------|------|
| Type          | d     | L     | S    | di   |
| SN_1204_      | 12.7  | 12.7  | 4.76 | 5.16 |
| SN_1506_      | 15.87 | 15.88 | 6.35 | 6.35 |
| SN_1906_      | 19.05 | 19.05 | 6.35 | 7.94 |
| SN_2507_      | 25.4  | 25.4  | 7.94 | 9.12 |
| SN_2509_      | 25.4  | 25.4  | 9.52 | 9.12 |

| Insert         | Designation | Cutting parameter |            | Grade      |        |        |        |        |        |        |        |        |        |        |  |  |  |  |
|----------------|-------------|-------------------|------------|------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--|--|--|--|
|                |             | f (mm/rev)        | ap (mm)    | WT8010     | WT8020 | WT8030 | WT5015 | WT5025 | WT5030 | WT5035 | WT4015 | WT4020 | WT3310 | WT3330 |  |  |  |  |
| Roughing       | SNMG        | 150608-RP         | 0.20-0.60  | 1.20-6.50  | △      |        | ▲      |        |        |        |        |        |        |        |  |  |  |  |
|                |             | 150612-RP         | 0.30-0.70  | 1.80-6.50  | △      |        | ▲      |        |        |        |        |        |        |        |  |  |  |  |
|                |             | 150616-RP         | 0.40-0.80  | 2.40-6.50  | △      |        | ▲      |        |        |        |        |        |        |        |  |  |  |  |
|                |             | 190612-RP         | 0.30-0.70  | 1.80-8.00  | ▲      | △      | ▲      |        |        |        |        |        |        |        |  |  |  |  |
|                |             | 190616-RP         | 0.40-0.80  | 2.40-8.00  | ▲      | △      | ▲      |        |        |        |        |        |        |        |  |  |  |  |
|                | SNMA        | 120408            | 0.20-0.60  | 1.20-6.00  |        |        |        |        |        |        |        | ▲      | △      |        |  |  |  |  |
|                |             | 120412            | 0.30-0.70  | 1.80-6.00  |        |        |        |        |        |        |        | ▲      | △      |        |  |  |  |  |
|                |             | 120416            | 0.40-0.80  | 2.40-6.00  |        |        |        |        |        |        |        | ▲      |        |        |  |  |  |  |
|                |             | 150612            | 0.30-0.70  | 1.80-7.00  |        |        |        |        |        |        |        | △      |        |        |  |  |  |  |
|                |             | 150616            | 0.40-0.80  | 2.40-7.00  |        |        |        |        |        |        |        | △      |        |        |  |  |  |  |
| 190612         |             | 0.40-0.80         | 1.80-8.50  |            |        |        |        |        |        |        | △      |        |        |        |  |  |  |  |
| Heavy roughing | SNMM        | 150612-QR         | 0.25-0.65  | 2.20-6.50  | △      |        | ▲      |        |        |        |        |        |        |        |  |  |  |  |
|                |             | 150616-QR         | 0.35-0.75  | 3.00-6.50  | △      |        | ▲      |        |        |        |        |        |        |        |  |  |  |  |
|                |             | 190612-QR         | 0.25-0.65  | 2.20-8.50  | △      |        | ▲      |        |        |        |        |        |        |        |  |  |  |  |
|                |             | 190616-QR         | 0.35-0.75  | 3.00-8.50  | ▲      | △      | ▲      |        |        |        |        |        |        |        |  |  |  |  |
|                |             | 190624-QR         | 0.50-0.85  | 3.50-8.50  | ▲      | △      | ▲      |        |        |        |        |        |        |        |  |  |  |  |
|                |             | 250724-QR         | 0.50-0.85  | 4.50-10.00 |        |        | ▲      |        |        |        |        |        |        |        |  |  |  |  |
|                | 250924-QR   | 0.50-0.85         | 4.50-10.00 | ▲          | △      | ▲      |        |        |        |        |        |        |        |        |  |  |  |  |
|                | SNMM        | 190612-HR         | 0.26-0.60  | 2.50-8.50  | △      |        | ▲      |        |        |        |        |        |        |        |  |  |  |  |
|                |             | 190616-HR         | 0.35-0.80  | 3.50-8.50  | △      |        | ▲      |        |        |        |        |        |        |        |  |  |  |  |
|                |             | 190624-HR         | 0.50-1.20  | 4.00-8.50  | ▲      | △      | ▲      |        |        |        |        |        |        |        |  |  |  |  |
| 250724-HR      |             | 0.50-1.20         | 4.50-10.50 |            |        | ▲      |        |        |        |        |        |        |        |        |  |  |  |  |
| 250924-HR      |             | 0.50-1.20         | 4.50-10.50 | ▲          | △      | ▲      |        |        |        |        |        |        |        |        |  |  |  |  |

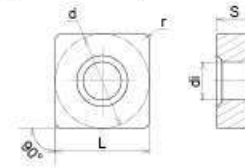
|   |                         |
|---|-------------------------|
| P | Steel                   |
| M | Stainless steel         |
| K | Cast Iron               |
| N | Non-ferrous alloys      |
| S | High temperature alloys |
| H | Hardened steel          |

Processing conditions

- Stable cutting
- General cutting
- ✘ Unstable cutting

△ General stock ▲ Regular stock

Negative Square Inserts



| Dimension(mm) |       |       |      |      |
|---------------|-------|-------|------|------|
| Type          | d     | L     | S    | di   |
| SN_1906_      | 19.05 | 19.05 | 6.35 | 7.94 |
| SN_2507_      | 25.4  | 25.4  | 7.94 | 9.12 |
| SN_2509_      | 25.4  | 25.4  | 9.52 | 9.12 |

| Insert         | Designation | Cutting parameter |           | Grade      |        |        |        |        |        |        |        |        |        |        |  |  |  |  |
|----------------|-------------|-------------------|-----------|------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--|--|--|--|
|                |             | f (mm/rev)        | ap (mm)   | WT8010     | WT8020 | WT8030 | WT5015 | WT5025 | WT5030 | WT5035 | WT4015 | WT4020 | WT3310 | WT3330 |  |  |  |  |
| Heavy roughing | SNMM        | 190616-HH         | 0.35-0.80 | 3.50-9.50  |        |        | ▲      |        |        |        |        |        |        |        |  |  |  |  |
|                |             | 190624-HH         | 0.50-1.20 | 4.00-9.50  | ▲      | △      | ▲      |        |        |        |        |        |        |        |  |  |  |  |
|                |             | 250724-HH         | 0.50-1.20 | 4.50-12.50 |        |        | ▲      |        |        |        |        |        |        |        |  |  |  |  |
|                |             | 250924-HH         | 0.50-1.20 | 4.50-12.50 | ▲      | △      | ▲      |        |        |        |        |        |        |        |  |  |  |  |
|                |             |                   |           |            |        |        |        |        |        |        |        |        |        |        |  |  |  |  |

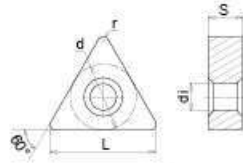
|   |                         |
|---|-------------------------|
| P | Steel                   |
| M | Stainless steel         |
| K | Cast Iron               |
| N | Non-ferrous alloys      |
| S | High temperature alloys |
| H | Hardened steel          |

Processing conditions

- Stable cutting
- General cutting
- ✘ Unstable cutting

△ General stock ▲ Regular stock

Negative Triangular Inserts



| Dimension(mm) |      |      |      |      |
|---------------|------|------|------|------|
| Type          | d    | L    | S    | di   |
| TN_1604_      | 9.52 | 16.5 | 4.76 | 3.81 |
| TN_2204_      | 12.7 | 22.0 | 4.76 | 5.16 |

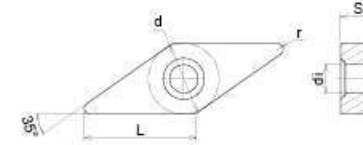
| Insert            | Designation | Cutting parameter |           | Grade     |        |        |        |        |        |        |        |        |        |        |   |
|-------------------|-------------|-------------------|-----------|-----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---|
|                   |             | f (mm/rev)        | ap (mm)   | WT8010    | WT8020 | WT8030 | WT5015 | WT5025 | WT5030 | WT5035 | WT4015 | WT4020 | WT3310 | WT3330 |   |
| Finishing         | TNMG        | 160404-FS         | 0.05-0.15 | 0.25-1.20 |        |        |        | ▲      |        |        |        |        |        | ▲      | ▲ |
|                   |             | 160408-FS         | 0.10-0.30 | 0.50-1.50 |        |        |        | ▲      | ▲      |        |        |        |        | ▲      | ▲ |
| Semi-finishing    | TNMG        | 160404-MS         | 0.06-0.20 | 0.30-3.00 |        |        |        | ▲      | ▲      |        |        |        |        | ▲      | ▲ |
|                   |             | 160408-MS         | 0.12-0.35 | 0.60-3.00 |        |        |        | ▲      | ▲      | △      |        |        |        | ▲      | ▲ |
|                   |             | 160412-MS         | 0.18-0.40 | 0.90-3.00 |        |        |        | ▲      | ▲      | △      |        |        |        | ▲      | ▲ |
|                   |             | 220408-MS         | 0.12-0.35 | 0.60-3.50 |        |        |        | ▲      | ▲      |        |        |        |        | ▲      |   |
|                   |             | 220412-MS         | 0.18-0.40 | 0.90-3.50 |        |        |        | ▲      | ▲      |        |        |        |        | ▲      |   |
| Medium processing | TNMG        | 160404-ES         | 0.08-0.25 | 0.40-3.50 |        |        |        | ▲      |        |        |        |        |        | ▲      |   |
|                   |             | 160408-ES         | 0.15-0.45 | 0.80-3.50 |        |        |        | ▲      | ▲      |        |        |        |        | ▲      | ▲ |
|                   |             | 160412-ES         | 0.20-0.50 | 1.20-3.50 |        |        |        | ▲      |        |        |        |        |        | ▲      |   |
|                   | TNMG        | 160404-MP         | 0.08-0.25 | 0.40-3.50 | ▲      |        | ▲      |        |        |        |        |        |        |        |   |
|                   |             | 160408-MP         | 0.15-0.45 | 0.80-3.50 | ▲      | △      | ▲      |        |        |        |        |        |        |        |   |
|                   |             | 160412-MP         | 0.20-0.50 | 1.20-3.50 | ▲      |        | ▲      |        |        |        |        |        |        |        |   |
|                   | TNMG        | 160404            | 0.08-0.25 | 0.40-3.50 |        |        |        |        |        |        |        | ▲      | ▲      |        |   |
|                   |             | 160408            | 0.15-0.45 | 0.80-3.50 |        |        |        |        |        |        |        | ▲      | ▲      |        |   |
|                   |             | 160412            | 0.20-0.50 | 1.20-3.50 |        |        |        |        |        |        |        | ▲      | ▲      |        |   |
| 220412            |             | 0.20-0.50         | 1.20-4.50 |           |        |        |        |        |        |        | ▲      | ▲      |        |        |   |
| 220416            | 0.25-0.55   | 1.80-4.50         |           |           |        |        |        |        |        |        | ▲      |        |        |        |   |
|                   | TNMA        | 160404            | 0.10-0.30 | 0.60-4.00 |        |        |        |        |        |        | ▲      | △      |        |        |   |
|                   |             | 160408            | 0.15-0.45 | 1.00-4.00 |        |        |        |        |        |        | ▲      | ▲      |        |        |   |
|                   |             | 160412            | 0.20-0.50 | 1.20-4.00 |        |        |        |        |        |        | ▲      |        |        |        |   |
| 160416            |             | 0.25-0.55         | 1.50-4.00 |           |        |        |        |        |        | ▲      |        |        |        |        |   |
| 220408            |             | 0.15-0.45         | 1.20-5.00 |           |        |        |        |        |        | ▲      |        |        |        |        |   |
| 220412            |             | 0.20-0.50         | 1.50-5.00 |           |        |        |        |        |        | ▲      |        |        |        |        |   |
| 220416            | 0.25-0.55   | 1.80-5.00         |           |           |        |        |        |        | ▲      |        |        |        |        |        |   |

|   |                         |
|---|-------------------------|
| P | Steel                   |
| M | Stainless steel         |
| K | Cast Iron               |
| N | Non-ferrous alloys      |
| S | High temperature alloys |
| H | Hardened steel          |

Processing conditions  
 ● Stable cutting  
 ● General cutting  
 ✘ Unstable cutting

△ General stock ▲ Regular stock

Negative 35° Rhombic Inserts



| Dimension(mm) |      |      |      |      |
|---------------|------|------|------|------|
| Type          | d    | L    | S    | di   |
| VN_1604_      | 9.52 | 16.5 | 4.76 | 3.81 |

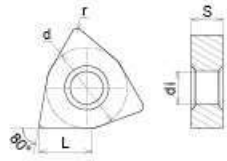
| Insert            | Designation | Cutting parameter |           | Grade     |        |        |        |        |        |        |        |        |        |        |   |
|-------------------|-------------|-------------------|-----------|-----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---|
|                   |             | f (mm/rev)        | ap (mm)   | WT8010    | WT8020 | WT8030 | WT5015 | WT5025 | WT5030 | WT5035 | WT4015 | WT4020 | WT3310 | WT3330 |   |
| Finishing         | VNMG        | 160404-FS         | 0.05-0.15 | 0.20-2.00 |        |        |        | ▲      |        |        |        |        |        | ▲      | ▲ |
|                   |             | 160408-FS         | 0.10-0.30 | 0.30-2.00 |        |        |        | ▲      | △      |        |        |        |        | ▲      | ▲ |
| Semi-finishing    | VNMG        | 160404-MS         | 0.06-0.20 | 0.30-2.50 |        |        |        | ▲      | ▲      |        |        |        |        | ▲      |   |
|                   |             | 160408-MS         | 0.12-0.35 | 0.50-2.50 |        |        |        | ▲      | ▲      | △      |        |        |        | ▲      | ▲ |
| Medium processing | VNMG        | 160404-ES         | 0.08-0.25 | 0.40-3.00 |        |        |        | ▲      | ▲      |        |        |        |        | ▲      |   |
|                   |             | 160408-ES         | 0.15-0.35 | 0.80-3.00 |        |        |        | ▲      | ▲      | △      |        |        |        | ▲      | ▲ |
|                   |             | 160412-ES         | 0.20-0.40 | 1.20-3.00 |        |        |        | ▲      |        |        |        |        |        | ▲      |   |
|                   | VNMG        | 160404-MP         | 0.08-0.25 | 0.40-3.00 | ▲      | △      | ▲      |        |        |        |        |        |        |        |   |
|                   |             | 160408-MP         | 0.15-0.35 | 0.60-3.00 | ▲      | △      | ▲      |        |        |        |        |        |        |        |   |
|                   |             | 160412-MP         | 0.20-0.40 | 1.00-3.00 | △      |        | ▲      |        |        |        |        |        |        |        |   |
| VNMG              | 160404      | 0.08-0.30         | 0.40-3.00 |           |        |        |        |        |        |        |        |        |        | ▲      |   |
|                   | 160408      | 0.15-0.40         | 0.80-3.00 |           |        |        |        |        |        |        | ▲      | ▲      |        |        |   |
|                   | 160412      | 0.20-0.45         | 1.20-3.00 |           |        |        |        |        |        |        | ▲      | ▲      |        |        |   |

|   |                         |
|---|-------------------------|
| P | Steel                   |
| M | Stainless steel         |
| K | Cast Iron               |
| N | Non-ferrous alloys      |
| S | High temperature alloys |
| H | Hardened steel          |

Processing conditions  
 ● Stable cutting  
 ● General cutting  
 ✘ Unstable cutting

△ General stock ▲ Regular stock

Negative 80°Trigon Inserts



| Dimension(mm) |      |      |      |      |
|---------------|------|------|------|------|
| Type          | d    | L    | S    | di   |
| WN_0604_      | 9.52 | 6.52 | 4.76 | 3.81 |
| WN_0804_      | 12.7 | 8.70 | 4.76 | 5.16 |

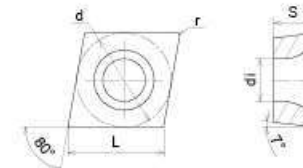
| Insert            | Designation | Cutting parameter |           | Grade     |        |        |        |        |        |        |        |        |        |        |   |   |   |
|-------------------|-------------|-------------------|-----------|-----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---|---|---|
|                   |             | f (mm/rev)        | ap (mm)   | WT8010    | WT8020 | WT8030 | WT5015 | WT5025 | WT5030 | WT5035 | WT4015 | WT4020 | WT3310 | WT3330 |   |   |   |
| Finishing         | WNMG        | 080404-FS         | 0.05-0.15 | 0.20-2.00 |        |        |        | ▲      | ▲      |        |        |        |        |        | ▲ | ▲ |   |
|                   |             | 080408-FS         | 0.10-0.30 | 0.50-2.00 |        |        |        | ▲      | ▲      |        |        |        |        |        | ▲ | ▲ |   |
| Semi-finishing    | WNMG        | 060404-MS         | 0.06-0.25 | 0.40-2.00 |        |        |        | ▲      |        |        |        |        |        |        |   | ▲ |   |
|                   |             | 060408-MS         | 0.10-0.35 | 0.60-2.00 |        |        |        | ▲      |        |        |        |        |        |        |   | ▲ |   |
|                   |             | 080404-MS         | 0.06-0.25 | 0.40-2.50 |        |        |        | ▲      | ▲      |        |        |        |        |        |   | ▲ | ▲ |
|                   |             | 080408-MS         | 0.10-0.35 | 0.60-2.50 |        |        |        | ▲      | ▲      | △      | △      |        |        |        |   | ▲ | ▲ |
|                   |             | 080412-MS         | 0.15-0.40 | 0.80-2.50 |        |        |        | ▲      | ▲      |        | △      |        |        |        |   | ▲ | ▲ |
| Medium processing | WNMG        | 080404-ES         | 0.08-0.30 | 0.40-3.00 |        |        |        | ▲      |        |        |        |        |        |        | ▲ | ▲ |   |
|                   |             | 080408-ES         | 0.15-0.35 | 0.80-3.00 |        |        |        | ▲      | ▲      |        |        |        |        |        | ▲ | ▲ |   |
|                   |             | 080412-ES         | 0.20-0.40 | 1.20-3.00 |        |        |        | ▲      |        |        |        |        |        |        | ▲ | ▲ |   |
|                   | WNMG        | 060408-MP         | 0.15-0.40 | 0.60-2.50 | ▲      |        | ▲      |        |        |        |        |        |        |        |   |   |   |
|                   |             | 080404-MP         | 0.08-0.30 | 0.40-3.00 | ▲      | △      | ▲      |        |        |        |        |        |        |        |   |   |   |
|                   |             | 080408-MP         | 0.15-0.40 | 0.80-3.00 | ▲      | △      | ▲      |        |        |        |        |        |        |        |   |   |   |
|                   |             | 080412-MP         | 0.20-0.45 | 1.20-3.00 | ▲      | △      | ▲      |        |        |        |        |        |        |        |   |   |   |
|                   | WNMG        | 080404            | 0.08-0.30 | 0.40-3.00 |        |        |        |        |        |        |        | ▲      | ▲      |        |   |   |   |
|                   |             | 080408            | 0.15-0.40 | 0.80-3.00 |        |        |        |        |        |        |        | ▲      | ▲      |        |   |   |   |
|                   |             | 080412            | 0.20-0.45 | 1.20-3.00 |        |        |        |        |        |        |        | ▲      | ▲      |        |   |   |   |
| WNMG              | 080408-RP   | 0.15-0.60         | 1.20-3.50 | ▲         | △      | ▲      |        |        |        |        |        |        |        |        |   |   |   |
|                   | 080412-RP   | 0.20-0.65         | 1.80-3.50 | ▲         | △      | ▲      |        |        |        |        |        |        |        |        |   |   |   |
|                   | WNMA        | 080404            | 0.10-0.35 | 0.60-4.00 |        |        |        |        |        |        |        | ▲      |        |        |   |   |   |
|                   |             | 080408            | 0.15-0.60 | 1.20-4.00 |        |        |        |        |        |        |        | ▲      | △      |        |   |   |   |
| 080412            |             | 0.20-0.70         | 1.80-4.00 |           |        |        |        |        |        |        | ▲      | △      |        |        |   |   |   |
| 080416            |             | 0.25-0.75         | 2.00-4.00 |           |        |        |        |        |        |        | ▲      |        |        |        |   |   |   |

|   |                         |
|---|-------------------------|
| P | Steel                   |
| M | Stainless steel         |
| K | Cast iron               |
| N | Non-ferrous alloys      |
| S | High temperature alloys |
| H | Hardened steel          |

- Processing conditions
- Stable cutting
  - General cutting
  - ✘ Unstable cutting

△ General stock ▲ Regular stock

Positive 80°Rhombic Inserts



| Dimension(mm) |      |      |      |      |
|---------------|------|------|------|------|
| Type          | d    | L    | S    | di   |
| CC_0602_      | 6.35 | 6.45 | 2.38 | 2.80 |
| CC_09T3_      | 9.52 | 9.67 | 3.97 | 4.40 |

| Insert    | Designation | Cutting parameter |           | Grade     |        |        |        |        |        |        |        |        |        |        |   |   |   |   |
|-----------|-------------|-------------------|-----------|-----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---|---|---|---|
|           |             | f (mm/rev)        | ap (mm)   | WT8010    | WT8020 | WT8030 | WT5015 | WT5025 | WT5030 | WT5035 | WT4015 | WT4020 | WT3310 | WT3330 |   |   |   |   |
| Finishing | CCMT        | 060202-LU         | 0.02-0.07 | 0.10-1.00 |        | ▲      |        | ▲      | ▲      |        |        |        |        |        | ▲ | ▲ |   |   |
|           |             | 060204-LU         | 0.04-0.10 | 0.15-1.00 | ▲      | ▲      | △      | ▲      | ▲      |        |        |        |        |        | ▲ | ▲ |   |   |
|           |             | 060208-LU         | 0.06-0.15 | 0.20-1.00 |        | ▲      | △      |        | ▲      |        |        |        |        |        |   | ▲ | ▲ |   |
|           |             | 09T302-LU         | 0.02-0.07 | 0.10-1.50 |        | ▲      |        |        | ▲      |        |        |        |        |        |   |   | ▲ | ▲ |
|           |             | 09T304-LU         | 0.04-0.15 | 0.15-1.50 | ▲      | ▲      | △      | ▲      | ▲      |        |        |        |        |        |   | ▲ | ▲ |   |
|           |             | 09T308-LU         | 0.06-0.20 | 0.20-1.50 |        | ▲      | △      |        | ▲      |        |        |        |        |        |   |   | ▲ | ▲ |

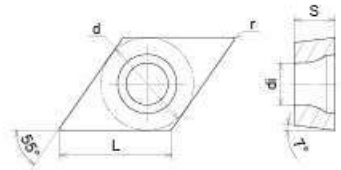
|   |                         |
|---|-------------------------|
| P | Steel                   |
| M | Stainless steel         |
| K | Cast iron               |
| N | Non-ferrous alloys      |
| S | High temperature alloys |
| H | Hardened steel          |

- Processing conditions
- Stable cutting
  - General cutting
  - ✘ Unstable cutting

△ General stock ▲ Regular stock



Positive 55° Rhombic Inserts



| Dimension(mm) |      |       |      |      |
|---------------|------|-------|------|------|
| Type          | d    | L     | S    | di   |
| DC_0702_      | 6.35 | 7.75  | 2.38 | 2.80 |
| DC_11T3_      | 9.52 | 11.62 | 3.97 | 4.40 |

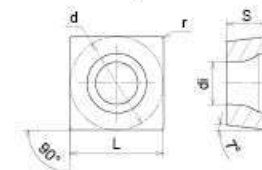
| Insert    | Designation | Cutting parameter |           | Grade     |        |        |        |        |        |        |        |        |        |        |   |
|-----------|-------------|-------------------|-----------|-----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---|
|           |             | f (mm/rev)        | ap (mm)   | WT8010    | WT8020 | WT8030 | WT5015 | WT5025 | WT5030 | WT5035 | WT4015 | WT4020 | WT3310 | WT3330 |   |
| Finishing | DCMT        | 070202-LU         | 0.02-0.10 | 0.10-1.30 | ▲      | ▲      |        | ▲      |        |        |        |        |        | ▲      | ▲ |
|           |             | 070204-LU         | 0.04-0.15 | 0.20-1.30 | ▲      | ▲      | △      | ▲      | ▲      |        |        |        |        | ▲      | ▲ |
|           |             | 11T302-LU         | 0.02-0.10 | 0.10-1.80 |        | ▲      |        | ▲      | ▲      |        |        |        |        | ▲      | ▲ |
|           |             | 11T304-LU         | 0.04-0.15 | 0.20-1.80 | ▲      | ▲      | △      | ▲      | ▲      |        |        |        |        | ▲      | ▲ |
|           |             | 11T308-LU         | 0.06-0.20 | 0.30-1.80 |        | ▲      | △      | ▲      |        |        |        |        |        |        | ▲ |

|   |                         |
|---|-------------------------|
| P | Steel                   |
| M | Stainless steel         |
| K | Cast iron               |
| N | Non-ferrous alloys      |
| S | High temperature alloys |
| H | Hardened steel          |

- Processing conditions
- Stable cutting
  - General cutting
  - ⚡ Unstable cutting

△ General stock ▲ Regular stock

Positive Square Inserts



| Dimension(mm) |      |      |      |      |
|---------------|------|------|------|------|
| Type          | d    | L    | S    | di   |
| SC_09T3_      | 9.52 | 9.52 | 3.97 | 4.40 |
| SC_1204_      | 12.7 | 12.7 | 4.76 | 5.50 |

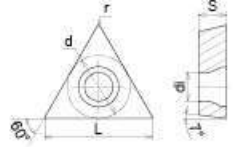
| Insert    | Designation | Cutting parameter |           | Grade     |        |        |        |        |        |        |        |        |        |        |   |
|-----------|-------------|-------------------|-----------|-----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---|
|           |             | f (mm/rev)        | ap (mm)   | WT8010    | WT8020 | WT8030 | WT5015 | WT5025 | WT5030 | WT5035 | WT4015 | WT4020 | WT3310 | WT3330 |   |
| Finishing | SCMT        | 09T304-LU         | 0.04-0.15 | 0.30-1.50 | ▲      | ▲      | △      | ▲      | ▲      |        |        |        |        |        | ▲ |
|           |             | 09T308-LU         | 0.06-0.20 | 0.60-1.50 |        | ▲      |        | ▲      | ▲      |        |        |        |        |        |   |
|           |             | 120404-LU         | 0.04-0.15 | 0.30-2.00 | ▲      | ▲      | △      | ▲      | ▲      |        |        |        |        |        | ▲ |

|   |                         |
|---|-------------------------|
| P | Steel                   |
| M | Stainless steel         |
| K | Cast iron               |
| N | Non-ferrous alloys      |
| S | High temperature alloys |
| H | Hardened steel          |

- Processing conditions
- Stable cutting
  - General cutting
  - ⚡ Unstable cutting

△ General stock ▲ Regular stock

Positive Triangular Inserts

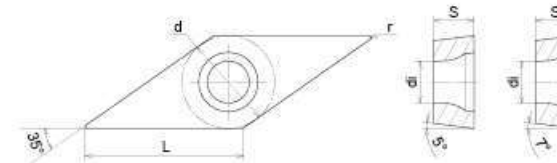


| Dimension(mm) |      |      |      |      |
|---------------|------|------|------|------|
| Type          | d    | L    | S    | di   |
| TC_0902_      | 5.56 | 9.63 | 2.38 | 2.50 |
| TC_1102_      | 6.35 | 11.0 | 2.38 | 2.80 |
| TC_16T3_      | 9.52 | 16.5 | 3.97 | 4.40 |

| Insert               | Designation               | Cutting parameter  |           | Grade     |        |        |        |        |        |        |        |        |        |        |  |   |  |
|----------------------|---------------------------|--------------------|-----------|-----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--|---|--|
|                      |                           | f (mm/rev)         | ap (mm)   | WT8010    | WT8020 | WT8030 | WT5015 | WT5025 | WT5030 | WT5035 | WT4015 | WT4020 | WT3310 | WT3330 |  |   |  |
| Finishing            | TCMT                      | 090204-LU          | 0.04-0.15 | 0.30-1.50 | ▲      | ▲      | ▲      | ▲      | ▲      |        |        |        |        |        |  | △ |  |
|                      |                           | 090208-LU          | 0.06-0.20 | 0.60-1.50 |        | ▲      | ▲      |        | ▲      |        |        |        |        |        |  | △ |  |
|                      |                           | 110204-LU          | 0.05-0.15 | 0.40-1.50 | ▲      | ▲      | ▲      | ▲      | ▲      |        |        |        |        |        |  | △ |  |
|                      |                           | 110208-LU          | 0.06-0.20 | 0.60-1.50 |        | ▲      | ▲      |        | ▲      |        |        |        |        |        |  | △ |  |
|                      |                           | 16T304-LU          | 0.05-0.15 | 0.30-2.00 | ▲      | ▲      | ▲      | ▲      | ▲      |        |        |        |        |        |  | △ |  |
|                      |                           | 16T308-LU          | 0.06-0.20 | 0.60-2.00 | ▲      | ▲      | ▲      | ▲      | ▲      |        |        |        |        |        |  | △ |  |
|                      |                           | 16T312-LU          | 0.09-0.25 | 0.80-2.00 |        | ▲      | △      |        | ▲      |        |        |        |        |        |  |   |  |
|                      |                           |                    |           |           |        |        |        |        |        |        |        |        |        |        |  |   |  |
| Processing materials | P Steel                   |                    |           |           | ●      | ●      | ●      |        |        |        |        |        |        |        |  |   |  |
|                      | M Stainless steel         |                    |           |           |        |        |        | ●      | ●      |        |        |        |        |        |  | ● |  |
|                      | K Cast Iron               |                    |           |           |        |        |        |        |        |        |        |        |        |        |  |   |  |
|                      | N Non-ferrous alloys      |                    |           |           |        |        |        |        |        |        |        |        |        |        |  |   |  |
|                      | S High temperature alloys |                    |           |           |        |        |        |        |        |        |        |        |        |        |  |   |  |
|                      | H Hardened steel          |                    |           |           |        |        |        |        |        |        |        |        |        |        |  |   |  |
|                      | Processing conditions     |                    |           |           |        |        |        |        |        |        |        |        |        |        |  |   |  |
|                      |                           | ● Stable cutting   |           |           |        |        |        |        |        |        |        |        |        |        |  |   |  |
|                      |                           | ● General cutting  |           |           |        |        |        |        |        |        |        |        |        |        |  |   |  |
|                      |                           | ⚡ Unstable cutting |           |           |        |        |        |        |        |        |        |        |        |        |  |   |  |

△ General stock ▲ Regular stock

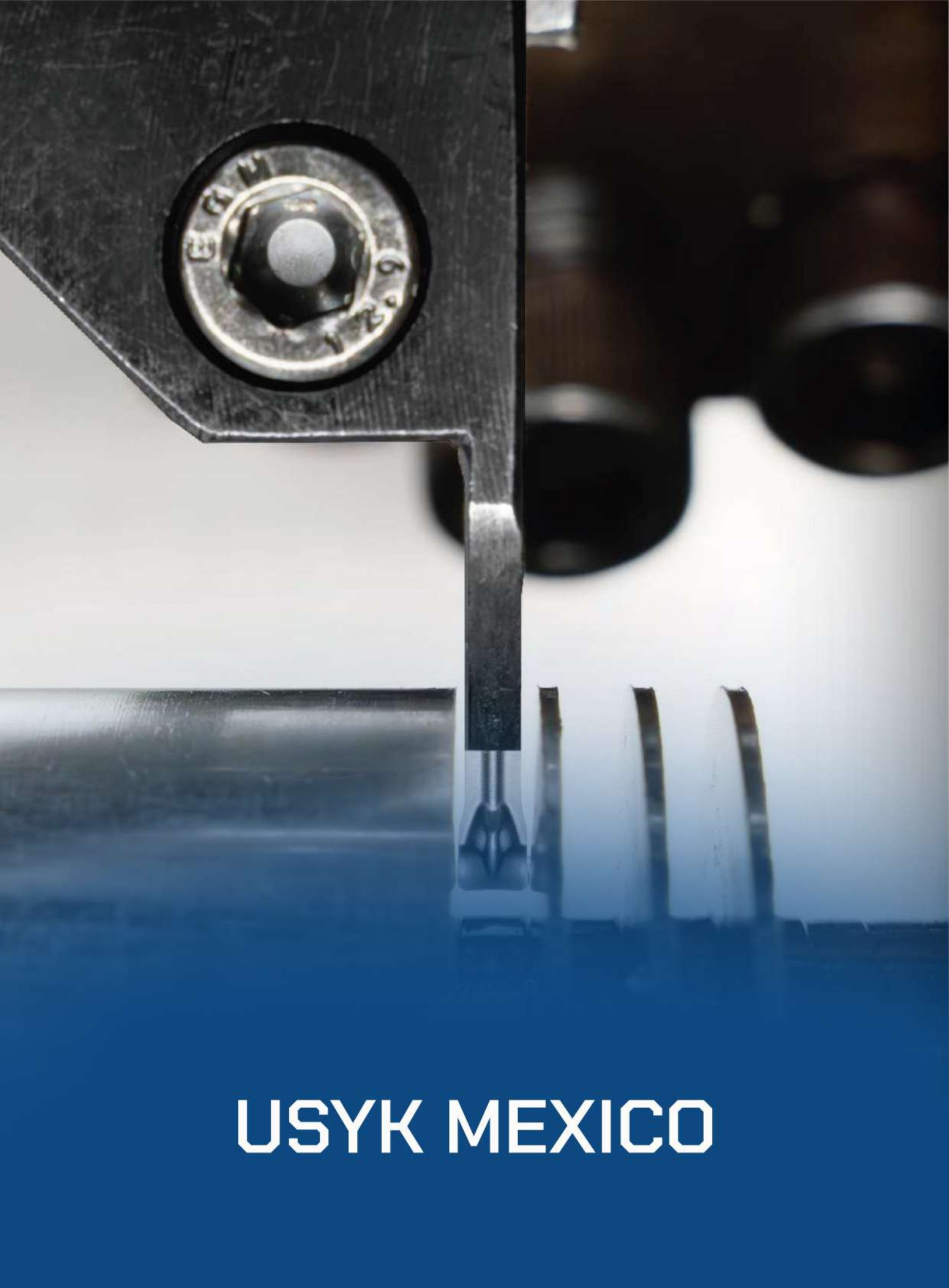
Positive 35° Rhombic Inserts



| Dimension(mm) |      |       |      |      |
|---------------|------|-------|------|------|
| Type          | d    | L     | S    | di   |
| VB_1103_      | 6.35 | 11.07 | 3.18 | 2.80 |
| VB_1604_      | 9.52 | 16.61 | 4.76 | 4.40 |
| VC_1604_      | 9.52 | 16.61 | 4.76 | 4.40 |

| Insert               | Designation               | Cutting parameter  |           | Grade     |        |        |        |        |        |        |        |        |        |        |   |   |  |
|----------------------|---------------------------|--------------------|-----------|-----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---|---|--|
|                      |                           | f (mm/rev)         | ap (mm)   | WT8010    | WT8020 | WT8030 | WT5015 | WT5025 | WT5030 | WT5035 | WT4015 | WT4020 | WT3310 | WT3330 |   |   |  |
| Finishing            | VBMT                      | 110302-LU          | 0.02-0.10 | 0.10-1.00 | ▲      | ▲      |        |        | ▲      |        |        |        |        |        |   | ▲ |  |
|                      |                           | 110304-LU          | 0.04-0.15 | 0.15-1.00 | ▲      | ▲      | △      | ▲      | ▲      |        |        |        |        |        |   | ▲ |  |
|                      |                           | 110308-LU          | 0.06-0.20 | 0.20-1.00 |        | ▲      | ▲      |        | ▲      |        |        |        |        |        |   |   |  |
|                      |                           | 160402-LU          | 0.02-0.10 | 0.10-1.50 | ▲      | ▲      |        |        | ▲      |        |        |        |        |        |   | ▲ |  |
|                      |                           | 160404-LU          | 0.04-0.15 | 0.15-1.50 | ▲      | ▲      | △      | ▲      | ▲      |        |        |        |        |        |   | ▲ |  |
|                      |                           | 160408-LU          | 0.06-0.20 | 0.20-1.50 |        | ▲      | △      |        | ▲      |        |        |        |        |        |   |   |  |
|                      |                           |                    |           |           |        |        |        |        |        |        |        |        |        |        |   |   |  |
|                      |                           |                    |           |           |        |        |        |        |        |        |        |        |        |        |   |   |  |
| Finishing            | VCMT                      | 160404-LU          | 0.04-0.15 | 0.15-1.50 |        | ▲      |        | ▲      | ▲      |        |        |        |        |        | ▲ |   |  |
|                      |                           | 160408-LU          | 0.06-0.20 | 0.20-1.50 |        | ▲      |        | ▲      | ▲      |        |        |        |        |        | ▲ |   |  |
| Processing materials | P Steel                   |                    |           |           | ●      | ●      | ●      |        |        |        |        |        |        |        |   |   |  |
|                      | M Stainless steel         |                    |           |           |        |        |        | ●      | ●      |        |        |        |        |        |   | ● |  |
|                      | K Cast Iron               |                    |           |           |        |        |        |        |        |        |        |        |        |        |   |   |  |
|                      | N Non-ferrous alloys      |                    |           |           |        |        |        |        |        |        |        |        |        |        |   |   |  |
|                      | S High temperature alloys |                    |           |           |        |        |        |        |        |        |        |        |        |        |   |   |  |
|                      | H Hardened steel          |                    |           |           |        |        |        |        |        |        |        |        |        |        |   |   |  |
|                      | Processing conditions     |                    |           |           |        |        |        |        |        |        |        |        |        |        |   |   |  |
|                      |                           | ● Stable cutting   |           |           |        |        |        |        |        |        |        |        |        |        |   |   |  |
|                      |                           | ● General cutting  |           |           |        |        |        |        |        |        |        |        |        |        |   |   |  |
|                      |                           | ⚡ Unstable cutting |           |           |        |        |        |        |        |        |        |        |        |        |   |   |  |

△ General stock ▲ Regular stock



**USYK MEXICO**

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### Parting & Grooving Insert

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### Parting & Grooving Holder

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Insert Designation System

**CM** **G** **D** **N** **200** **020** **-** **J** **-** **6R**



1 2 3 4 Space 5 6 - 7 - 8

|  |  |   |
|--|--|---|
| <p>1 - Company product series</p>  | <p>2 - Cutting type</p> <p>G: Grooving/Parting<br/>T: Grooving/Turning</p>           | <p>3 - Insert type</p> <p>S: Single<br/>D: Double</p>     |
| <p>4 - Hand of Insert</p> <p>N: Neutral<br/>L: Left hand<br/>R: Right hand</p> | <p>5 - Insert width W</p> <p>200=2.0mm<br/>300=3.0mm<br/>400=4.0mm<br/>500=5.0mm</p> | <p>6 - Corner radius r</p> <p>020=0.2mm<br/>030=0.3mm</p> |
| <p>7 - Chipbreaker</p> <p>C<br/>J</p>  | <p>8 - Cutting edge angle K</p> <p>6<br/>15</p>                                      |   |





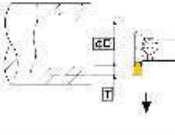


▶▶ Parting & Grooving Insert

Chipbreaker Introduction

| Application     | Chip breaker |   | Application and features   |
|-----------------|--------------|---|--|
| Medium feed     | C            |  | <ul style="list-style-type: none"> <li>• For parting and grooving application</li> <li>• Suitable for grooving and parting of alloy steel, carbon steel, stainless steel, cast iron</li> </ul>                                     |
| Medium low feed | J            |  | <ul style="list-style-type: none"> <li>• For machining of stainless steel, mild steel and thin-wall workpiece</li> <li>• Suitable for grooving and parting of stainless steel, low carbon alloy steel, low carbon steel</li> </ul> |

Insert Selection Guide

|             |          | Insert  | CMGDN   |   |
|-------------|----------|---|---|---|
|             |          |   | C   | J |
| Application |          |  |  |   |
| Page        |          | G08   | G08   |   |
| External    | Grooving |  | ●   | ● |
|             | Parting  |  | ●   | ● |
| Internal    | Grooving |  | ●   | ● |

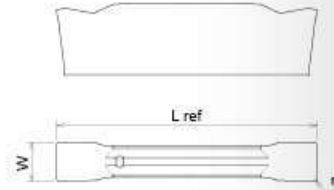
ISO Application Range

|                |                                |     | ISO range of insert grade |        |        |        |        |        |
|----------------|--------------------------------|-----|---------------------------|--------|--------|--------|--------|--------|
| Material Group | Material                       | ISO | PVD Coated                |        |        |        |        |        |
|                |                                |     | WT5015                    | WT5025 | WT5030 | WT5035 | WT7020 | WT3310 |
| P              | Unalloyed steel, alloyed steel | P01 |                           |        |        |        |        |        |
|                |                                | P05 | WT5015                    |        |        |        |        |        |
|                |                                | P10 | WT5015                    | WT5025 |        |        |        |        |
|                |                                | P15 | WT5015                    | WT5025 | WT5030 |        |        |        |
|                |                                | P20 | WT5015                    | WT5025 | WT5030 |        |        |        |
|                |                                | P25 |                           | WT5025 | WT5030 | WT5035 |        |        |
|                |                                | P30 |                           |        | WT5030 | WT5035 |        |        |
|                |                                | P35 |                           |        |        | WT5035 |        |        |
|                |                                | P40 |                           |        | WT5030 | WT5035 |        |        |
|                |                                | P45 |                           |        |        |        | WT5035 |        |
| P50            |                                |     |                           |        |        |        |        |        |
| M              | Stainless steel                | M01 |                           |        |        |        |        |        |
|                |                                | M05 | WT5015                    |        |        |        |        | WT3310 |
|                |                                | M10 | WT5015                    |        |        |        |        |        |
|                |                                | M15 | WT5015                    | WT5025 |        |        |        |        |
|                |                                | M20 | WT5015                    | WT5025 | WT5030 |        |        |        |
|                |                                | M25 |                           | WT5025 | WT5030 | WT5035 |        |        |
|                |                                | M30 |                           |        | WT5030 | WT5035 |        |        |
|                |                                | M35 |                           |        |        | WT5035 |        |        |
|                |                                | M40 |                           |        |        | WT5035 |        |        |
|                |                                | M45 |                           |        |        |        |        |        |
| K              | Cast iron                      | K01 |                           |        |        |        |        |        |
|                |                                | K05 |                           |        |        |        |        |        |
|                |                                | K10 |                           |        |        |        |        |        |
|                |                                | K15 |                           |        |        |        |        |        |
|                |                                | K20 |                           |        |        |        |        |        |
|                |                                | K25 |                           |        |        |        |        |        |
|                |                                | K30 |                           |        |        |        | WT7020 |        |
|                |                                | K35 |                           |        |        |        | WT7020 |        |
|                |                                | K40 |                           |        |        |        | WT7020 |        |
|                |                                | K45 |                           |        |        |        | WT7020 |        |
| S              | High temperature alloy         | S01 |                           |        |        |        |        |        |
|                |                                | S05 | WT5015                    |        |        |        |        | WT3310 |
|                |                                | S10 | WT5015                    |        |        |        |        |        |
|                |                                | S15 | WT5015                    |        |        |        |        |        |
|                |                                | S20 | WT5015                    |        |        |        |        |        |
|                |                                | S25 |                           |        |        |        |        |        |
|                |                                | S30 |                           |        | WT5030 |        |        |        |
|                |                                | S35 |                           |        |        |        |        |        |
|                |                                | S40 |                           |        |        |        |        |        |
|                |                                | S45 |                           |        |        |        |        |        |
| N              | Non-ferrous alloy              | N01 |                           |        |        |        |        |        |
|                |                                | N05 |                           |        |        |        |        |        |
|                |                                | N10 |                           |        |        |        |        |        |
|                |                                | N15 |                           |        |        |        |        |        |
|                |                                | N20 |                           |        |        |        |        |        |
|                |                                | N25 |                           |        |        |        |        |        |
| N30            |                                |     |                           |        |        |        |        |        |
| H              | Hardened steel, cold cast iron | H01 |                           |        |        |        |        |        |
|                |                                | H05 |                           |        |        |        |        |        |
|                |                                | H10 |                           |        |        |        |        |        |
|                |                                | H15 |                           |        |        |        |        |        |
|                |                                | H20 |                           |        |        |        |        |        |
|                |                                | H25 |                           |        |        |        |        |        |
| H30            |                                |     |                           |        |        |        |        |        |

PVD Coated Garbide Grades

| Grade  | Appearance    | ISO     | Characteristics & Applications  |
|--------|---------------|---------|---|
| WT5015 | Black brown   | P05-P20 | • Submircon substrate, excellent wear resistance  |
|        |               | M05-M20 | • For stable machining of steel, stainless steel, high temperature alloy and hardened steel           |
|        |               | S05-S20 |   |
| WT5025 | Black brown   | P10-P30 | • Submircon substrate, good wear resistance   |
|        |               | M10-M30 | • For machining of steel and stainless steel  |
| WT5030 | Golden yellow | P15-P40 | • Submircon substrate, good wear resistance   |
|        |               | M15-M40 | • For machining of steel, stainless steel and high temperature alloy                                  |
|        |               | S15-S40 |   |
| WT5035 | Grey black    | P25-P45 | • Tough carbide substrate, good fracture toughness  |
|        |               | M25-M45 | • For rough machining of steel and stainless steel  |
| WT7020 | Black brown   | K10-K30 | • Tough carbide substrate<br>• For machining of gray cast iron, ductile cast iron nad alloy cast iron |
| WT3310 | Bronze        | S05-S20 | • Submircon substrate, excellent wear resistance  |
|        |               | M05-M20 | • For machining of high temperature alloy and stainless steel   |

CMMN-J/C type  
CMGDN-J/C type



| Insert | Designation |          | Cutting parameter |      | Geometric dimensions |      |      | Grade  |        |        |        |        |        |   |  |
|--------|-------------|----------|-------------------|------|----------------------|------|------|--------|--------|--------|--------|--------|--------|---|--|
|        |             |          | f (mm/rev)        | Tmax | W                    | r    | L    | WT5015 | WT5025 | WT5030 | WT5035 | WT7020 | WT3310 |   |  |
|        | CMMN        | 150015-C | 0.05-0.20         | 15.0 | 1.50                 | 0.15 | 16.0 | ▲      |        |        |        |        |        |   |  |
|        |             | 200020-C | 0.06-0.20         | 15.0 | 2.00                 | 0.2  | 16.0 | ▲      |        | ▲      | △      |        |        |   |  |
|        |             | 250020-C | 0.06-0.20         | 17.0 | 2.50                 | 0.2  | 18.0 | ▲      |        |        |        |        |        |   |  |
|        |             | 300040-C | 0.07-0.22         | 20.0 | 3.00                 | 0.4  | 21.0 | ▲      |        | ▲      | ▲      |        |        |   |  |
|        |             | 400040-C | 0.08-0.25         | 20.0 | 4.00                 | 0.4  | 21.0 | ▲      |        | ▲      | ▲      |        |        |   |  |
|        |             | 500080-C | 0.09-0.30         | 25.0 | 5.00                 | 0.8  | 26.0 | ▲      |        | △      | ▲      |        |        |   |  |
|        | CMMN        | 150015-J | 0.04-0.15         | 15.0 | 1.50                 | 0.15 | 16.0 | ▲      |        |        |        |        |        |   |  |
|        |             | 200020-J | 0.04-0.15         | 15.0 | 2.00                 | 0.2  | 16.0 | ▲      |        |        |        |        | ▲      |   |  |
|        |             | 250020-J | 0.04-0.18         | 17.0 | 2.50                 | 0.2  | 18.0 | ▲      |        |        |        |        |        |   |  |
|        |             | 300040-J | 0.05-0.20         | 20.0 | 3.00                 | 0.4  | 21.0 | ▲      |        |        |        |        |        | ▲ |  |
|        |             | 400040-J | 0.06-0.20         | 20.0 | 4.00                 | 0.4  | 21.0 | ▲      |        |        |        |        |        | ▲ |  |
|        |             | 500080-J | 0.07-0.22         | 25.0 | 5.00                 | 0.8  | 26.0 | ▲      |        |        |        |        |        | ▲ |  |
|        | CMGDN       | 200020-C | 0.05-0.20         | 19.0 | 2.00                 | 0.2  | 20.0 | ▲      |        | ▲      | △      |        |        |   |  |
|        |             | 300020-C | 0.06-0.22         | 19.0 | 3.00                 | 0.2  | 20.0 | ▲      |        | ▲      | ▲      |        |        |   |  |
|        |             | 400030-C | 0.07-0.25         | 18.0 | 4.00                 | 0.3  | 19.0 | ▲      |        | ▲      | ▲      |        |        |   |  |
|        |             | 500030-C | 0.08-0.30         | 18.0 | 5.00                 | 0.3  | 19.0 | ▲      |        | ▲      | ▲      |        |        |   |  |
|        | CMGDN       | 200020-J | 0.04-0.12         | 19.0 | 2.00                 | 0.2  | 20.0 | ▲      |        |        |        |        | ▲      |   |  |
|        |             | 300020-J | 0.04-0.15         | 19.0 | 3.00                 | 0.2  | 20.0 | ▲      |        |        |        |        | ▲      |   |  |
|        |             | 400030-J | 0.05-0.16         | 18.0 | 4.00                 | 0.3  | 19.0 | ▲      |        |        |        |        | ▲      |   |  |
|        |             | 500030-J | 0.05-0.18         | 18.0 | 5.00                 | 0.3  | 19.0 | ▲      |        |        |        |        | △      |   |  |

|   |                         |
|---|-------------------------|
| P | Steel                   |
| M | Stainless steel         |
| K | Cast Iron               |
| N | Non-ferrous alloys      |
| S | High temperature alloys |
| H | Hardened steel          |

Processing conditions

- Stable cutting
- ◐ General cutting
- ✘ Unstable cutting

△ General stock ▲ Regular stock

Holder Designation System



**1 - Brand**

**2 - Application type**

G: Grooving/Parting  
T: Turning/Grooving

**3 - Machining type**

E: External  
I: Internal  
F: Facing

**4 - Shape of holder head**

H: Linear 0°  
V: Vertical 90°  
U: Under cut 45°

**5 - Hand of tool**

L: Left hand  
R: Right hand

**6 - Holder diameter d/height H**

16=16.0mm  
20=20.0mm  
25=25.0mm  
32=32.0mm

**7 - Holder width B**

16=16.0mm  
20=20.0mm  
25=25.0mm  
32=32.0mm

**8 - Insert width W**

2=2.0mm  
3=3.0mm  
4=4.0mm  
5=5.0mm

**9 - Ap max**

T14=Max14mm  
T16=Max16mm  
T20=Max20mm

**10 - Minimum cutting diameter**

40=40.0mm

**11 - Maximum cutting diameter**

60=60.0mm

**12 - Special code**

RN: Outside bulge holders  
D: Reinforced holders  
SW: For swiss machine

**13 - Cooling type**

C: Inner-cooling  
External cooling is not indicated

Holder Selection Guide

| Application |          | Holder | External |            | Internal |
|-------------|----------|--------|----------|------------|----------|
|             |          |        | JGEHR/L  | JGEHR/L-SW | JGIVR/L  |
| Page        |          |        | G11      | G12        | G13      |
| External    | Grooving |        | ●        | ●          |          |
|             | Parting  |        | ●        | ●          |          |
| Internal    | Grooving |        |          |            | ●        |

External Parting Holder

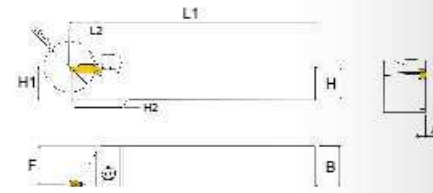
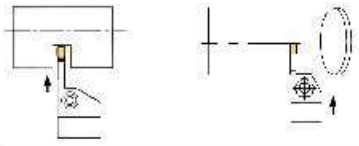


| Designation | Dimension(mm) |    |     |     |       |    |    | Insert |       |
|-------------|---------------|----|-----|-----|-------|----|----|--------|-------|
|             | H             | B  | L   | A   | T-max | W  | F  |        |       |
| JGEHR/L     | 1616-2T14     | 16 | 16  | 125 | 1.8   | 14 | 2  | 16     | CMGDN |
|             | 1616-3T16     | 16 | 16  | 125 | 2.4   | 16 | 3  | 16     |       |
|             | 2020-2T14     | 20 | 20  | 125 | 1.8   | 14 | 2  | 20     |       |
|             | 2020-3T20     | 20 | 20  | 125 | 2.4   | 20 | 3  | 20     |       |
|             | 2020-4T20     | 20 | 20  | 125 | 3.0   | 20 | 4  | 20     |       |
|             | 2525-2T14     | 25 | 25  | 150 | 1.8   | 14 | 2  | 25     |       |
|             | 2525-3T20     | 25 | 25  | 150 | 2.4   | 20 | 3  | 25     |       |
|             | 2525-4T20     | 25 | 25  | 150 | 3.0   | 20 | 4  | 25     |       |
| 2525-5T25   | 25            | 25 | 150 | 3.9 | 25    | 5  | 25 |        |       |

| Screw     | Wrench | Applicable holder  |
|-----------|--------|--------------------|
|           |        |                    |
| JSH050200 | L04    | JGEHR/L 1616-2     |
| JSH060250 | L05    | JGEHR/L 2020-2     |
| JSH060250 | L05    | JGEHR/L 2525-2     |
| JSH050200 | L04    | JGEHR/L 1616-3     |
| JSH060250 | L05    | JGEHR/L 2020-3/4   |
| JSH060250 | L05    | JGEHR/L 2525-3/4/5 |



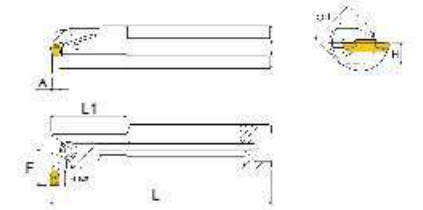
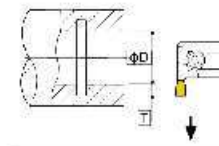
SW External Holder



| Designation             | Dimension(mm) |    |    |    |     |     |    |      |      | Insert |
|-------------------------|---------------|----|----|----|-----|-----|----|------|------|--------|
|                         | H             | B  | H1 | H2 | A   | L1  | L2 | F    | Dmax |        |
| JGEHR/L-SW 1010-2D20-SW | 10            | 10 | 10 | 2  | 1.8 | 125 | 20 | 9.1  | 20   | CMGDN  |
| 1212-2D24-SW            | 12            | 12 | 12 | 2  | 1.8 | 125 | 20 | 11.1 | 24   |        |
| 1414-2D24-SW            | 14            | 14 | 14 | 0  | 1.8 | 125 | 20 | 13.1 | 24   |        |
| 1616-2D32-SW            | 16            | 16 | 16 | 0  | 1.8 | 125 | 25 | 15.1 | 32   |        |
| 1212-3D24-SW            | 12            | 12 | 12 | 2  | 2.4 | 125 | 20 | 10.8 | 24   |        |
| 1616-3D32-SW            | 16            | 16 | 16 | 0  | 2.4 | 125 | 25 | 14.8 | 32   |        |
| 1616-3D38-SW            | 16            | 16 | 16 | 0  | 2.4 | 125 | 27 | 14.8 | 38   |        |
| 2020-3D45-SW            | 20            | 20 | 20 | 0  | 2.4 | 125 | 24 | 18.8 | 45   |        |
|                         |               |    |    |    |     |     |    |      |      |        |

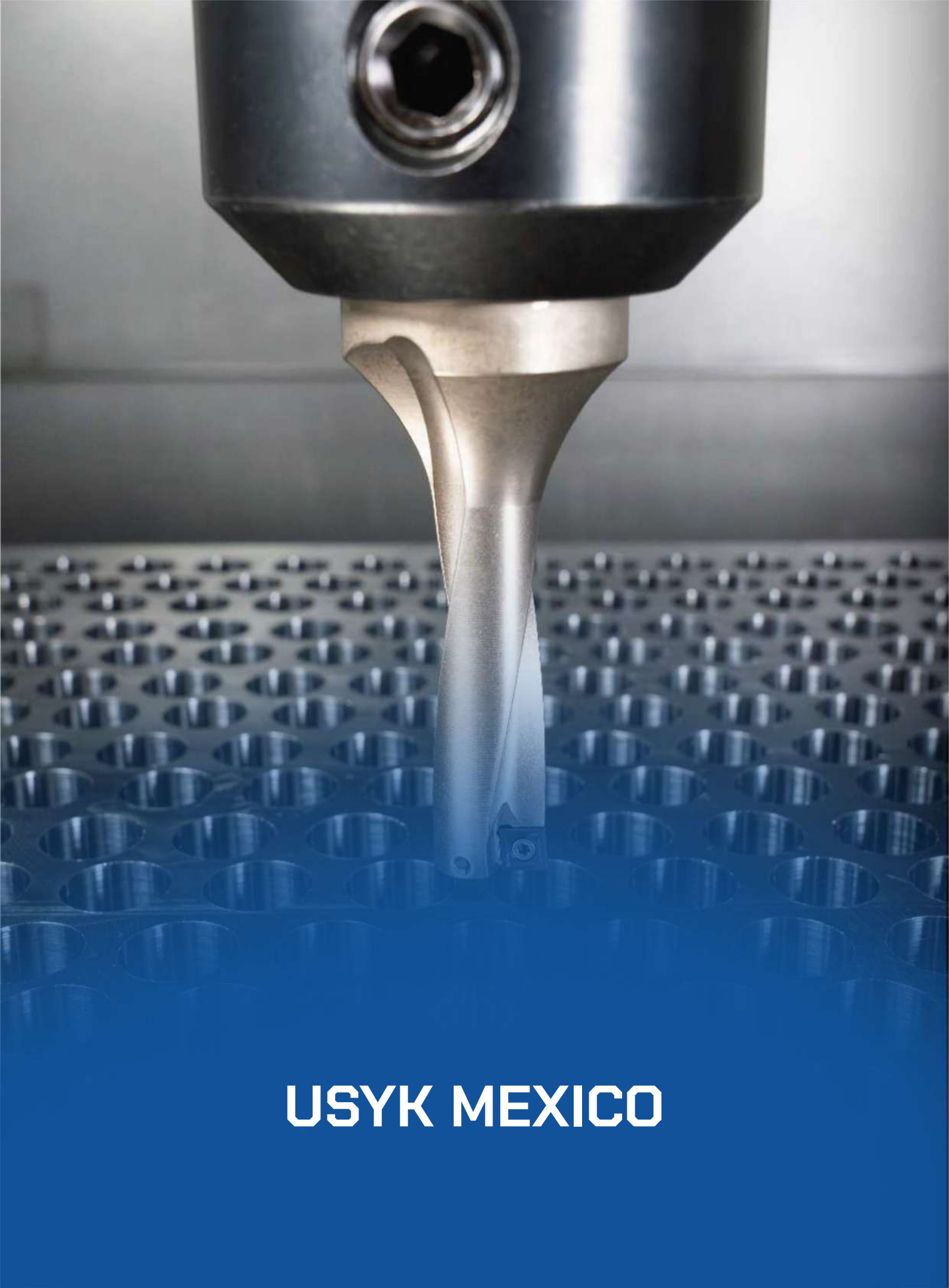
| Screw     | Wrench | Applicable holder   |
|-----------|--------|---------------------|
|           |        |                     |
| JSR040125 | T15    | JGEHR/L-SW 1010-2   |
| JSR040125 | T15    | JGEHR/L-SW 1212-2/3 |
| JSR040125 | T15    | JGEHR/L-SW 1414-2   |
| JSR040125 | T15    | JGEHR/L-SW 1616-2/3 |
| JSR040125 | T15    | JGEHR/L-SW 2020-3   |

Internal Grooving Holder



| Designation        | Dimension(mm) |     |    |      |      |     |       |      | Insert |
|--------------------|---------------|-----|----|------|------|-----|-------|------|--------|
|                    | φd            | L   | L1 | F    | H    | A   | T-max | Dmin |        |
| JGIVR/L 20-2T6.0-C | 20            | 160 | 40 | 15.8 | 9.0  | 1.6 | 6.0   | 25   | CMGDN  |
| 25-2T5.0-C         | 25            | 200 | 40 | 17.5 | 11.5 | 1.6 | 5.0   | 25   |        |
| 20-3T6.0-C         | 20            | 160 | 40 | 15.8 | 9.0  | 2.1 | 6.0   | 25   |        |
| 25-3T5.1-C         | 25            | 200 | 40 | 17.5 | 11.5 | 2.1 | 5.1   | 25   |        |
| 32-3T4.7-C         | 32            | 250 | 60 | 19.8 | 14.0 | 2.1 | 4.7   | 31   |        |
| 20-4T6.0-C         | 20            | 160 | 40 | 15.8 | 9.0  | 2.9 | 6.0   | 25   |        |
| 25-4T5.2-C         | 25            | 200 | 40 | 17.5 | 11.5 | 2.9 | 5.2   | 25   |        |
| 32-4T4.7-C         | 32            | 250 | 60 | 20.8 | 14.0 | 2.9 | 4.7   | 31   |        |
| 25-5T5.2-C         | 25            | 200 | 40 | 17.3 | 11.5 | 3.9 | 5.2   | 31   |        |
| 32-5T4.7-C         | 32            | 250 | 60 | 20.8 | 14.0 | 3.9 | 4.7   | 31   |        |

| Screw     | Wrench | Applicable holder |
|-----------|--------|-------------------|
|           |        |                   |
| JSH050120 | L04    | JGIVR/L 20-2/3/4  |
| JSH050160 | L04    | JGIVR/L 25-2/3/4  |
| JSH050160 | L04    | JGIVR/L 32-3/4    |
| JSH060160 | L05    | JGIVR/L 25-5      |
| JSH060160 | L05    | JGIVR/L 32-5      |



**USYK MEXICO**

# CONTENTS

## Drilling Insert

|                                       |     |
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## Drilling Holder

|                                 |     |
|---------------------------------|-----|
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| WC Series Drilling Holder ..... | D21 |

Insert Designation System

**S** **P** **M** **G**  

1 2 3 4 Space

**1 - Shape**

**2 - Clearance angle**

**3 - Tolerance**

| Class | Unit | d       | m       | s       |
|-------|------|---------|---------|---------|
| A     | mm   | ± 0.025 | ± 0.005 | ± 0.025 |
| C     | mm   | ± 0.025 | ± 0.013 | ± 0.025 |
| E     | mm   | ± 0.025 | ± 0.025 | ± 0.025 |
| F     | mm   | ± 0.013 | ± 0.005 | ± 0.025 |
| G     | mm   | ± 0.025 | ± 0.025 | ± 0.13  |
| H     | mm   | ± 0.013 | ± 0.013 | ± 0.025 |
| J     | mm   | *       | ± 0.005 | ± 0.025 |
| K     | mm   | *       | ± 0.013 | ± 0.025 |
| L     | mm   | *       | ± 0.025 | ± 0.025 |
| M     | mm   | *       | *       | ± 0.127 |
| U     | mm   | *       | *       | ± 0.127 |
| N     | mm   | *       | *       | ± 0.025 |

Shape: C, E, H, M, O, P, S, T, R, W

| IC     | d         |        | m      |        |
|--------|-----------|--------|--------|--------|
|        | J,K,L,M,N | U      | M, N   | U      |
| 4.76   | ± 0.05    | ± 0.08 | ± 0.08 | ± 0.13 |
| 5.56   | ± 0.05    | ± 0.08 | ± 0.08 | ± 0.13 |
| 6      | ± 0.05    | ± 0.08 | ± 0.08 | ± 0.13 |
| 6.35   | ± 0.05    | ± 0.08 | ± 0.08 | ± 0.13 |
| 7.94   | ± 0.05    | ± 0.08 | ± 0.08 | ± 0.13 |
| 8      | ± 0.05    | ± 0.08 | ± 0.08 | ± 0.13 |
| 9.525  | ± 0.05    | ± 0.08 | ± 0.08 | ± 0.13 |
| 10     | ± 0.05    | ± 0.08 | ± 0.08 | ± 0.13 |
| 12     | ± 0.08    | ± 0.13 | ± 0.13 | ± 0.2  |
| 12.7   | ± 0.08    | ± 0.13 | ± 0.13 | ± 0.2  |
| 15.875 | ± 0.1     | ± 0.18 | ± 0.15 | ± 0.27 |
| 16     | ± 0.1     | ± 0.18 | ± 0.15 | ± 0.27 |
| 19.05  | ± 0.1     | ± 0.18 | ± 0.15 | ± 0.27 |
| 20     | ± 0.1     | ± 0.18 | ± 0.15 | ± 0.27 |
| 25     | ± 0.13    | ± 0.25 | ± 0.18 | ± 0.38 |
| 25.4   | ± 0.13    | ± 0.25 | ± 0.18 | ± 0.38 |
| 31.75  | ± 0.15    | ± 0.25 | ± 0.2  | ± 0.38 |
| 32     | ± 0.15    | ± 0.25 | ± 0.2  | ± 0.38 |

\* For details refer to right and below tables

| M&N Class | D shape |        | V shape |        |
|-----------|---------|--------|---------|--------|
|           | d       | m      | d       | m      |
| 5.56      | ± 0.05  | ± 0.11 |         |        |
| 6.35      | ± 0.05  | ± 0.11 | ± 0.05  | ± 0.16 |
| 7.94      | ± 0.05  | ± 0.11 | ± 0.05  | ± 0.16 |
| 9.525     | ± 0.05  | ± 0.11 | ± 0.05  | ± 0.16 |
| 12.7      | ± 0.08  | ± 0.15 | ± 0.08  | ± 0.2  |
| 15.875    | ± 0.10  | ± 0.18 | ± 0.10  | ± 0.27 |
| 19.05     | ± 0.10  | ± 0.18 | ± 0.10  | ± 0.27 |

**4 - Type**

**06** **02** **04** **-** **UD**

5 6 7 8

**5 - Cutting edge length**

| In. Circle Dimension | S    | Edge  | W  | Edge |
|----------------------|------|-------|----|------|
|                      | 5.56 |       |    | 03   |
| 6.35                 | 06   | 6.35  | 04 | 4.3  |
| 7.94                 |      |       | 05 | 5.4  |
| 8.0                  | 08   | 8.0   |    |      |
| 9.525                | 09   | 9.525 | 06 | 6.5  |
| 12.7                 | 12   | 12.7  | 08 | 8.7  |

**7 - Corner radius**

Example

04=0.4

08=0.8

12=1.2

**6 - Thickness**

| Thickness description  | Thickness mark | Example          |
|--|----------------|------------------|
| Insert thickness "S" refers to the distance between cutting edge nose and bottom |                | 00=0.79 05=5.56  |
|  |                | T0=0.99 T5=5.95  |
|  |                | 01=1.59 06=6.35  |
|  |                | T1=1.98 07=7.94  |
|  |                | 02=2.38 09=9.53  |
|  |                | T2=2.58 11=11.11 |
|  |                | 03=3.18 12=12.70 |
|  |                | T3=3.97 14=14.29 |
|  |                | 04=4.76 15=15.88 |
|  |                | T4=4.96          |

**8 - Chip breaker**



ISO Application Range

| ISO range of Drilling insert grade |                                |     |            |        |        |
|------------------------------------|--------------------------------|-----|------------|--------|--------|
| Material Group                     | Material                       | ISO | PVD Coated |        |        |
|                                    |                                |     | WT5025     | WT5035 | WT3330 |
| P                                  | Unalloyed steel, alloyed steel | P01 |            |        |        |
|                                    |                                | P05 |            |        |        |
|                                    |                                | P10 |            |        |        |
|                                    |                                | P15 | WT5025     |        |        |
|                                    |                                | P20 |            |        |        |
|                                    |                                | P25 |            | WT5035 |        |
|                                    |                                | P30 |            |        |        |
|                                    |                                | P35 |            |        | WT3330 |
|                                    |                                | P40 |            |        |        |
|                                    |                                | P45 |            |        |        |
| P50                                |                                |     |            |        |        |
| M                                  | Stainless steel                | M01 |            |        |        |
|                                    |                                | M05 |            |        |        |
|                                    |                                | M10 |            |        |        |
|                                    |                                | M15 | WT5025     |        |        |
|                                    |                                | M20 |            |        |        |
|                                    |                                | M25 |            | WT5035 |        |
|                                    |                                | M30 |            |        |        |
|                                    |                                | M35 |            |        | WT3330 |
|                                    |                                | M40 |            |        |        |
|                                    |                                | M45 |            |        |        |
| K                                  | Cast Iron                      | K01 |            |        |        |
|                                    |                                | K05 |            |        |        |
|                                    |                                | K10 |            |        |        |
|                                    |                                | K15 |            |        |        |
|                                    |                                | K20 |            |        |        |
|                                    |                                | K25 |            |        |        |
|                                    |                                | K30 |            |        |        |
|                                    |                                | K35 |            |        |        |
|                                    |                                | K40 |            |        |        |
|                                    |                                | K45 |            |        |        |
| S                                  | High temperature alloy         | S01 |            |        |        |
|                                    |                                | S05 |            |        |        |
|                                    |                                | S10 |            |        |        |
|                                    |                                | S15 | WT5025     |        |        |
|                                    |                                | S20 |            |        |        |
|                                    |                                | S25 |            | WT5035 |        |
|                                    |                                | S30 |            |        |        |
|                                    |                                | S35 |            |        | WT3330 |
|                                    |                                | S40 |            |        |        |
|                                    |                                | S45 |            |        |        |
| N                                  | Non-ferrous alloy              | N01 |            |        |        |
|                                    |                                | N05 |            |        |        |
|                                    |                                | N10 |            |        |        |
|                                    |                                | N15 |            |        |        |
|                                    |                                | N20 |            |        |        |
|                                    |                                | N30 |            |        |        |
| H                                  | Hardened steel, cold cast iron | H01 |            |        |        |
|                                    |                                | H05 |            |        |        |
|                                    |                                | H10 |            |        |        |
|                                    |                                | H15 |            |        |        |
|                                    |                                | H20 |            |        |        |
|                                    |                                | H30 |            |        |        |

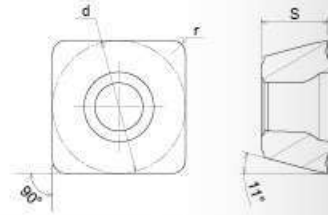
PVD Coated Carbide Grade


| Grade  | Appearance  | Range   | Characteristics & Applications   |
|--------|-------------|---------|--|
| WT5025 | Black brown | P15-P35 | • Submicron substrate, good wear resistance  |
|        |             | M15-M35 | • For drilling of steel, stainless steel, heat-resistant alloy and cast iron           |
|        |             | S15-S35 |  |
| WT5035 | Grey black  | P25-P45 | • Tough carbide substrate, good fracture toughness                                     |
|        |             | M25-M45 | • For unstable machining of steel, stainless steel, heat-resistant alloy and cast iron |
|        |             | S25-S45 |  |
| WT3330 | Bronze      | M15-M35 | • Submicron substrate, excellent BUE-resistant and stable machinability                |
|        |             | S15-S35 | • For machining of stainless steel, heat-resistant alloy and mild steel                |
|        |             | P15-P35 |  |

Introduction Of Chipbreaker

| Chip breaker   | Application and features  |
|--|---|
| UD  | <ul style="list-style-type: none"> <li>• Four cutting edges</li> <li>• Good surface roughness after machining</li> </ul>  |
| PD  | <ul style="list-style-type: none"> <li>• Three cutting edges</li> <li>• Higher efficiency machining</li> <li>• Suitable for through hole and lathe machining</li> </ul> |

SPMG Insert



| Insert  | Designation |           | Cutting parameter | Geometric dimensions |      |     | Grade  |        |        |
|---|-------------|-----------|-------------------|----------------------|------|-----|--------|--------|--------|
|   |             |           | fz (mm/rev)       | d                    | S    | r   | WT5025 | WT5035 | WT3330 |
|  | SPMG        | 050204-UD | 0.05-0.11         | 5.0                  | 2.38 | 0.4 | ▲      | ▲      |        |
|   |             | 060204-UD | 0.06-0.14         | 6.0                  | 2.38 | 0.4 | ▲      | ▲      |        |
|   |             | 07T308-UD | 0.06-0.18         | 7.94                 | 3.97 | 0.8 | ▲      | ▲      |        |
|   |             | 090408-UD | 0.07-0.20         | 9.8                  | 4.3  | 0.8 | ▲      | ▲      |        |
|   |             | 110408-UD | 0.08-0.22         | 11.5                 | 4.8  | 0.8 | ▲      | ▲      |        |
|   |             | 140512-UD | 0.08-0.24         | 14.3                 | 5.2  | 1.2 | ▲      | ▲      |        |
|   |             |           |                   |                      |      |     |        |        |        |

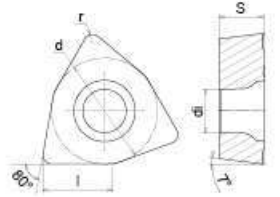
|   |                         |
|---|-------------------------|
| P | Steel                   |
| M | Stainless steel         |
| K | Cast iron               |
| N | Non-ferrous alloys      |
| S | High temperature alloys |
| H | Hardened steel          |


- Processing conditions
- Stable cutting
  - General cutting
  - ✘ Unstable cutting

|   |   |  |
|---|---|--|
| ● | ✘ |  |
| ● | ✘ |  |
| ● |   |  |
| ● |   |  |
| ● | ✘ |  |

△ General stock ▲ Regular stock

WCMT Insert



| Insert  | Designation |           | Cutting parameter | Geometric dimensions |      |     | Grade  |        |        |  |
|---|-------------|-----------|-------------------|----------------------|------|-----|--------|--------|--------|--|
|   |             |           | fz (mm/rev)       | d                    | S    | r   | WT5025 | WT5035 | WT3330 |  |
|  | WCMT        | 030208-PD | 0.04-0.10         | 5.56                 | 2.38 | 0.8 | ▲      | △      | ▲      |  |
|   |             | 040208-PD | 0.05-0.12         | 6.35                 | 2.38 | 0.8 | ▲      | △      | ▲      |  |
|   |             | 050308-PD | 0.07-0.15         | 7.94                 | 3.18 | 0.8 | ▲      | △      | ▲      |  |
|   |             | 06T308-PD | 0.08-0.18         | 9.525                | 3.97 | 0.8 | ▲      | △      | ▲      |  |
|   |             | 080412-PD | 0.09-0.20         | 12.7                 | 4.76 | 1.2 | ▲      | △      | ▲      |  |
|   |             |           |                   |                      |      |     |        |        |        |  |
|   |             |           |                   |                      |      |     |        |        |        |  |

|   |                         |
|---|-------------------------|
| P | Steel                   |
| M | Stainless steel         |
| K | Cast iron               |
| N | Non-ferrous alloys      |
| S | High temperature alloys |
| H | Hardened steel          |

- Processing conditions
- Stable cutting
  - General cutting
  - ✘ Unstable cutting

|   |   |   |
|---|---|---|
| ● | ✘ | ● |
| ● | ✘ | ● |
| ● |   |   |
| ● |   |   |
| ● | ✘ | ● |

△ General stock ▲ Regular stock

Recommended Drilling Conditions

| Materials |                            | SPMG insert                           |               |                      |     |        |     |        |     |                                   |             |           |           |           |           |           |           |           |           |
|-----------|----------------------------|---------------------------------------|---------------|----------------------|-----|--------|-----|--------|-----|-----------------------------------|-------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| ISO       | Material classification    | Tensile strength (N/mm <sup>2</sup> ) | Hardness (HB) | Cutting speed(m/min) |     |        |     |        |     | Drilling Holder Diameter Grouping |             |           |           |           |           |           |           |           |           |
|           |                            |                                       |               | WT5025               |     | WT5035 |     | WT3330 |     | Φ13-Φ15                           | Φ15.5-Φ21.5 | Φ22-Φ27.5 | Φ28-Φ33.5 | Φ34-Φ41   | Φ42-Φ50   | Φ51-Φ60   |           |           |           |
|           |                            |                                       |               | min                  | max | min    | max | min    | max | min                               | max         | min       | max       | min       | max       | min       | max       |           |           |
| P         | Unalloyed steel            | ≤600                                  | ≤180          | 80                   | 160 | 220    | 70  | 140    | 200 | -                                 | -           | -         | 0.05-0.08 | 0.06-0.10 | 0.06-0.12 | 0.07-0.13 | 0.08-0.15 | 0.08-0.16 | 0.07-0.13 |
|           |                            | ≤950                                  | ≤280          | 70                   | 150 | 220    | 65  | 130    | 180 | -                                 | -           | -         | 0.06-0.12 | 0.08-0.15 | 0.10-0.18 | 0.12-0.20 | 0.12-0.22 | 0.13-0.24 | 0.12-0.20 |
| M         | Alloyed steel              | 700-950                               | 200-280       | 70                   | 140 | 200    | 60  | 120    | 160 | -                                 | -           | -         | 0.06-0.10 | 0.08-0.14 | 0.10-0.18 | 0.12-0.20 | 0.12-0.22 | 0.13-0.24 | 0.12-0.20 |
|           |                            | 950-1200                              | 280-355       | 65                   | 120 | 180    | 55  | 100    | 160 | -                                 | -           | -         | 0.06-0.12 | 0.08-0.15 | 0.10-0.18 | 0.12-0.20 | 0.12-0.22 | 0.13-0.24 | 0.12-0.20 |
| K         | Austenitic stainless steel | 1200-1400                             | 355-415       | 60                   | 100 | 160    | 50  | 80     | 150 | -                                 | -           | -         | 0.06-0.10 | 0.08-0.14 | 0.10-0.18 | 0.12-0.20 | 0.12-0.22 | 0.13-0.24 | 0.12-0.20 |
|           |                            | 675                                   | 200           | 60                   | 110 | 160    | 45  | 90     | 150 | -                                 | -           | -         | 0.05-0.10 | 0.06-0.12 | 0.08-0.15 | 0.09-0.16 | 0.10-0.17 | 0.11-0.18 | 0.09-0.16 |
| S         | Duplex stainless steel     | 778                                   | 230           | 50                   | 90  | 140    | 40  | 70     | 130 | -                                 | -           | -         | 0.05-0.10 | 0.06-0.12 | 0.08-0.15 | 0.09-0.16 | 0.10-0.17 | 0.11-0.18 | 0.09-0.16 |
|           |                            | 1013                                  | 300           | -                    | -   | -      | 40  | 60     | 110 | -                                 | -           | -         | 0.05-0.09 | 0.06-0.10 | 0.07-0.13 | 0.08-0.14 | 0.09-0.15 | 0.10-0.16 | 0.08-0.14 |
| N         | Grey cast iron             | 700                                   | 220           | -                    | -   | -      | -   | -      | -   | -                                 | -           | -         | -         | -         | -         | -         | -         | -         | -         |
|           |                            | 880                                   | 260           | -                    | -   | -      | -   | -      | -   | -                                 | -           | -         | -         | -         | -         | -         | -         | -         | -         |
| H         | Modular cast iron          | 943                                   | 280           | -                    | -   | -      | 20  | 40     | 60  | -                                 | -           | -         | 0.05-0.10 | 0.06-0.14 | 0.08-0.16 | 0.10-0.20 | 0.12-0.22 | 0.14-0.24 | -         |
|           |                            | 1076                                  | 320           | -                    | -   | -      | 15  | 25     | 35  | -                                 | -           | -         | 0.05-0.10 | 0.06-0.12 | 0.07-0.13 | 0.9-0.15  | 0.10-0.18 | 0.11-0.20 | -         |
| H         | Ni-based alloy             | 1177                                  | 350           | -                    | -   | -      | 15  | 25     | 35  | -                                 | -           | -         | 0.05-0.10 | 0.06-0.12 | 0.07-0.13 | 0.9-0.15  | 0.10-0.18 | 0.11-0.20 | -         |
|           |                            | 1262                                  | 370           | -                    | -   | -      | 20  | 30     | 40  | -                                 | -           | -         | 0.05-0.10 | 0.06-0.12 | 0.07-0.13 | 0.9-0.15  | 0.10-0.18 | 0.11-0.20 | -         |
| N         | Aluminum                   | 260                                   | 75            | -                    | -   | -      | -   | -      | -   | -                                 | -           | -         | -         | -         | -         | -         | -         | -         | -         |
|           |                            | 447                                   | 130           | -                    | -   | -      | -   | -      | -   | -                                 | -           | -         | -         | -         | -         | -         | -         | -         | -         |
| H         | Hardened steel             | -                                     | 52-62HRC      | -                    | -   | -      | -   | -      | -   | -                                 | -           | -         | -         | -         | -         | -         | -         | -         | -         |
|           |                            | -                                     | ≥55HRC        | -                    | -   | -      | -   | -      | -   | -                                 | -           | -         | -         | -         | -         | -         | -         | -         | -         |

\*The above only refers to the general recommendation reference, the actual need to consider the machine tool, fixture, tool body rigidity, material changes and cutting fluid adjustment.

Recommended Drilling Conditions

| Materials |                            | SPMG insert                           |               |                      |     |        |     |        |     |                                   |           |           |           |           |           |           |           |   |
|-----------|----------------------------|---------------------------------------|---------------|----------------------|-----|--------|-----|--------|-----|-----------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|---|
| ISO       | Material classification    | Tensile strength (N/mm <sup>2</sup> ) | Hardness (HB) | Cutting speed(m/min) |     |        |     |        |     | Drilling Holder Diameter Grouping |           |           |           |           |           |           |           |   |
|           |                            |                                       |               | WT5025               |     | WT5035 |     | WT3330 |     | Φ16-Φ20.5                         | Φ21-Φ24.5 | Φ25-Φ30.5 | Φ31-Φ41   | Φ42-Φ60   |           |           |           |   |
|           |                            |                                       |               | min                  | max | min    | max | min    | max | min                               | max       | min       | max       | min       | max       |           |           |   |
| P         | Unalloyed steel            | ≤600                                  | ≤180          | 80                   | 160 | 220    | 70  | 140    | 200 | 80                                | 160       | 220       | 0.04-0.06 | 0.07-0.09 | 0.07-0.10 | 0.08-0.11 | 0.09-0.13 |   |
|           |                            | ≤950                                  | ≤280          | 70                   | 150 | 220    | 65  | 130    | 180 | -                                 | -         | -         | 0.05-0.07 | 0.07-0.09 | 0.07-0.10 | 0.08-0.11 | 0.09-0.13 |   |
| M         | Alloyed steel              | 700-950                               | 200-280       | 70                   | 140 | 200    | 60  | 120    | 160 | 70                                | 140       | 200       | 0.05-0.09 | 0.07-0.12 | 0.08-0.14 | 0.10-0.16 | 0.10-0.18 |   |
|           |                            | 950-1200                              | 280-355       | 65                   | 120 | 180    | 55  | 100    | 160 | -                                 | -         | -         | 0.04-0.09 | 0.07-0.11 | 0.07-0.12 | 0.09-0.14 | 0.10-0.16 |   |
| K         | Austenitic stainless steel | 1200-1400                             | 355-415       | 60                   | 100 | 160    | 50  | 80     | 150 | -                                 | -         | -         | 0.04-0.07 | 0.05-0.09 | 0.07-0.10 | 0.08-0.12 | 0.09-0.13 |   |
|           |                            | 675                                   | 200           | 60                   | 110 | 160    | 45  | 90     | 150 | 60                                | 120       | 180       | 0.04-0.08 | 0.06-0.11 | 0.08-0.13 | 0.08-0.14 | 0.08-0.15 |   |
| S         | Duplex stainless steel     | 778                                   | 230           | 50                   | 90  | 140    | 40  | 70     | 130 | 50                                | 100       | 160       | 0.04-0.07 | 0.06-0.10 | 0.07-0.11 | 0.08-0.12 | 0.09-0.13 |   |
|           |                            | 1013                                  | 300           | -                    | -   | -      | 40  | 60     | 110 | 45                                | 80        | 140       | 0.04-0.07 | 0.05-0.09 | 0.07-0.10 | 0.08-0.12 | 0.09-0.13 |   |
| N         | Grey cast iron             | 700                                   | 220           | -                    | -   | -      | -   | -      | -   | -                                 | -         | -         | -         | -         | -         | -         | -         | - |
|           |                            | 880                                   | 260           | -                    | -   | -      | -   | -      | -   | -                                 | -         | -         | -         | -         | -         | -         | -         | - |
| S         | Modular cast iron          | 943                                   | 280           | -                    | -   | -      | 20  | 40     | 60  | 30                                | 55        | 80        | 0.05-0.09 | 0.07-0.12 | 0.08-0.14 | 0.10-0.16 | 0.10-0.18 |   |
|           |                            | 1076                                  | 320           | -                    | -   | -      | 15  | 25     | 35  | 20                                | 30        | 40        | 0.04-0.07 | 0.05-0.09 | 0.07-0.10 | 0.08-0.12 | 0.09-0.13 |   |
| H         | Ni-based alloy             | 1177                                  | 350           | -                    | -   | -      | 15  | 25     | 35  | 20                                | 30        | 40        | 0.04-0.07 | 0.05-0.09 | 0.07-0.10 | 0.08-0.12 | 0.09-0.13 |   |
|           |                            | 1262                                  | 370           | -                    | -   | -      | 20  | 30     | 40  | 25                                | 40        | 60        | 0.04-0.07 | 0.05-0.09 | 0.07-0.10 | 0.08-0.12 | 0.09-0.13 |   |
| N         | Aluminum                   | 260                                   | 75            | -                    | -   | -      | -   | -      | -   | -                                 | -         | -         | -         | -         | -         | -         | -         | - |
|           |                            | 447                                   | 130           | -                    | -   | -      | -   | -      | -   | -                                 | -         | -         | -         | -         | -         | -         | -         | - |
| H         | Hardened steel             | -                                     | 52-62HRC      | -                    | -   | -      | -   | -      | -   | -                                 | -         | -         | -         | -         | -         | -         | -         | - |
|           |                            | -                                     | ≥55HRC        | -                    | -   | -      | -   | -      | -   | -                                 | -         | -         | -         | -         | -         | -         | -         | - |

\*The above only refers to the general recommendation reference, the actual need to consider the machine tool, fixture, tool body rigidity, material changes and cutting fluid adjustment.

Holder Designation System

|               |                |               |                 |               |                 |               |                  |
|---------------|----------------|---------------|-----------------|---------------|-----------------|---------------|------------------|
| <b>J</b><br>1 | <b>3D</b><br>2 | <b>-</b><br>- | <b>260</b><br>3 | <b>-</b><br>- | <b>W32</b><br>4 | <b>-</b><br>- | <b>SP07</b><br>5 |
|---------------|----------------|---------------|-----------------|---------------|-----------------|---------------|------------------|

|           |                                      |
|-----------|--------------------------------------|
| 1 - Brand | 2 - Drilling depth<br>2D; 3D; 4D; 5D |
|-----------|--------------------------------------|

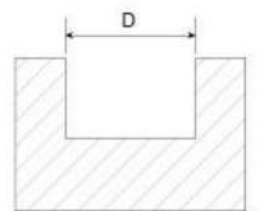
|  |  |
|--|--|
| 3 - Drill diameter<br>260=26.0mm<br>265=26.5mm | 4 - Shank diameter<br>W20=20mm<br>W25=25mm |
|--|--|

|  |
|--|
| 5 - Insert specification<br>SP07=SPMG 07T3..<br>WC06=WCMT 06T3.. |
|--|



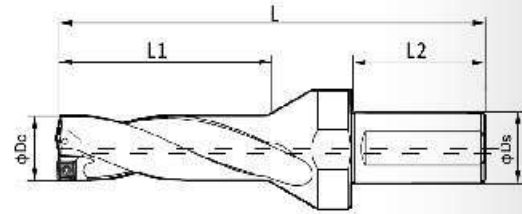
▶▶ Drilling Holder

Drilling Bore Diameter Tolerance



| Bore diameter | 2D          | 3D          | 4D          | 5D          |
|---------------|-------------|-------------|-------------|-------------|
| D13-D21.5     | -0.10~+0.15 | -0.10~+0.18 | -0.10~+0.20 | -0.10~+0.25 |
| D22-D50       | -0.10~+0.15 | -0.12~+0.20 | -0.15~+0.25 | -0.15~+0.30 |
| D51-60        | -0.15~+0.20 | -0.15~+0.25 | -0.15~+0.30 | -0.15~+0.33 |

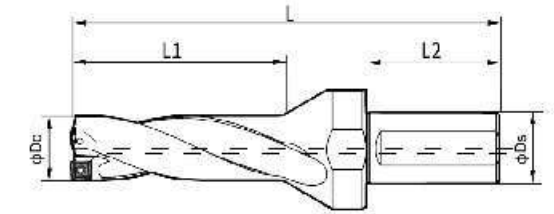
SP Series Drilling Holder  
Drilling Depth: 2D



| Designation      | Dimension(mm) |    |     |    |    | Inserts     |             |
|------------------|---------------|----|-----|----|----|-------------|-------------|
|                  | Dc            | L1 | L   | Ds | L2 |             |             |
| J2D-130-W20-SP05 | 13.0          | 29 | 88  | 20 | 44 | SPMG 050204 |             |
| J2D-135-W20-SP05 | 13.5          | 30 | 89  | 20 | 44 |             |             |
| J2D-140-W20-SP05 | 14.0          | 31 | 90  | 20 | 44 |             |             |
| J2D-145-W20-SP05 | 14.5          | 32 | 91  | 20 | 44 |             |             |
| J2D-150-W20-SP05 | 15.0          | 33 | 92  | 20 | 44 |             |             |
| J2D-155-W20-SP06 | 15.5          | 34 | 93  | 20 | 44 |             | SPMG 060204 |
| J2D-160-W20-SP06 | 16.0          | 35 | 94  | 20 | 44 |             |             |
| J2D-165-W20-SP06 | 16.5          | 36 | 95  | 20 | 44 |             |             |
| J2D-170-W20-SP06 | 17.0          | 37 | 96  | 20 | 44 |             |             |
| J2D-175-W25-SP06 | 17.5          | 38 | 109 | 25 | 56 |             |             |
| J2D-180-W25-SP06 | 18.0          | 39 | 110 | 25 | 56 |             |             |
| J2D-185-W25-SP06 | 18.5          | 40 | 111 | 25 | 56 |             |             |
| J2D-190-W25-SP06 | 19.0          | 41 | 112 | 25 | 56 |             |             |
| J2D-195-W25-SP06 | 19.5          | 42 | 113 | 25 | 56 |             |             |
| J2D-200-W25-SP06 | 20.0          | 43 | 114 | 25 | 56 |             |             |
| J2D-205-W25-SP06 | 20.5          | 44 | 115 | 25 | 56 | SPMG 07T308 |             |
| J2D-210-W25-SP06 | 21.0          | 45 | 116 | 25 | 56 |             |             |
| J2D-215-W25-SP06 | 21.5          | 46 | 117 | 25 | 56 |             |             |
| J2D-220-W25-SP07 | 22.0          | 47 | 118 | 25 | 56 |             |             |
| J2D-225-W25-SP07 | 22.5          | 48 | 119 | 25 | 56 |             |             |
| J2D-230-W25-SP07 | 23.0          | 49 | 123 | 25 | 56 |             |             |
| J2D-235-W25-SP07 | 23.5          | 50 | 124 | 25 | 56 |             |             |
| J2D-240-W25-SP07 | 24.0          | 51 | 125 | 25 | 56 |             |             |
| J2D-245-W25-SP07 | 24.5          | 52 | 126 | 25 | 56 |             |             |
| J2D-250-W25-SP07 | 25.0          | 53 | 127 | 25 | 56 |             |             |
| J2D-255-W32-SP07 | 25.5          | 54 | 134 | 32 | 60 |             |             |
| J2D-260-W32-SP07 | 26.0          | 55 | 135 | 32 | 60 |             |             |
| J2D-265-W32-SP07 | 26.5          | 56 | 136 | 32 | 60 |             |             |

| Screw     | Wrench | Applicable holder                 |
|-----------|--------|-----------------------------------|
|           |        |                                   |
| JST020040 | T06    | J2D-130-W20-SP05~J2D-150-W20-SP05 |
| JST022050 | T07    | J2D-155-W20-SP06~J2D-170-W20-SP06 |
| JST022050 | T07    | J2D-175-W25-SP06~J2D-215-W25-SP06 |
| JST025060 | T08    | J2D-220-W25-SP07~J2D-275-W32-SP07 |

SP Series Drilling Holder  
Drilling Depth: 2D

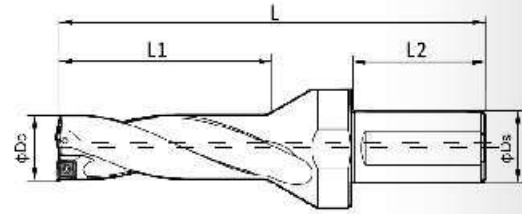


| Designation      | Dimension(mm) |    |     |    |    | Inserts     |
|------------------|---------------|----|-----|----|----|-------------|
|                  | Dc            | L1 | L   | Ds | L2 |             |
| J2D-270-W32-SP07 | 27.0          | 57 | 137 | 32 | 60 | SPMG 07T308 |
| J2D-275-W32-SP07 | 27.5          | 58 | 138 | 32 | 60 |             |
| J2D-280-W32-SP09 | 28.0          | 59 | 139 | 32 | 60 | SPMG 090408 |
| J2D-285-W32-SP09 | 28.5          | 60 | 140 | 32 | 60 |             |
| J2D-290-W32-SP09 | 29.0          | 62 | 143 | 32 | 60 |             |
| J2D-295-W32-SP09 | 29.5          | 63 | 144 | 32 | 60 |             |
| J2D-300-W32-SP09 | 30.0          | 64 | 148 | 32 | 60 |             |
| J2D-305-W32-SP09 | 30.5          | 65 | 149 | 32 | 60 |             |
| J2D-310-W32-SP09 | 31.0          | 66 | 150 | 32 | 60 |             |
| J2D-315-W32-SP09 | 31.5          | 67 | 151 | 32 | 60 |             |
| J2D-320-W32-SP09 | 32.0          | 68 | 152 | 32 | 60 |             |
| J2D-325-W32-SP09 | 32.5          | 69 | 153 | 32 | 60 |             |
| J2D-330-W32-SP09 | 33.0          | 70 | 154 | 32 | 60 |             |
| J2D-335-W32-SP09 | 33.5          | 71 | 155 | 32 | 60 |             |
| J2D-340-W40-SP11 | 34.0          | 72 | 156 | 40 | 60 |             |
| J2D-345-W40-SP11 | 34.5          | 73 | 157 | 40 | 60 |             |
| J2D-350-W40-SP11 | 35.0          | 74 | 158 | 40 | 60 |             |
| J2D-355-W40-SP11 | 35.5          | 75 | 159 | 40 | 60 |             |
| J2D-360-W40-SP11 | 36.0          | 76 | 160 | 40 | 60 |             |
| J2D-365-W40-SP11 | 36.5          | 77 | 161 | 40 | 60 |             |
| J2D-370-W40-SP11 | 37.0          | 79 | 169 | 40 | 60 |             |
| J2D-375-W40-SP11 | 37.5          | 80 | 170 | 40 | 60 |             |
| J2D-380-W40-SP11 | 38.0          | 81 | 171 | 40 | 60 |             |
| J2D-385-W40-SP11 | 38.5          | 82 | 172 | 40 | 60 |             |
| J2D-390-W40-SP11 | 39.0          | 83 | 173 | 40 | 60 |             |
| J2D-395-W40-SP11 | 39.5          | 84 | 174 | 40 | 60 |             |
| J2D-400-W40-SP11 | 40.0          | 85 | 185 | 40 | 70 |             |
| J2D-410-W40-SP11 | 41.0          | 87 | 187 | 40 | 70 |             |



| Screw     | Wrench | Applicable holder                 |
|-----------|--------|-----------------------------------|
|           |        |                                   |
| JST025060 | T08    | J2D-220-W25-SP07~J2D-275-W32-SP07 |
| JST035080 | T15    | J2D-280-W32-SP09~J2D-335-W32-SP09 |
| JST040100 | T15    | J2D-340-W40-SP11~J2D-410-W40-SP11 |



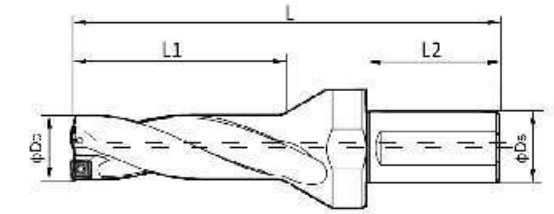
SP Series Drilling Holder  
Drilling Depth: 2D





| Designation      | Dimension(mm) |     |     |    |    | Inserts     |
|------------------|---------------|-----|-----|----|----|-------------|
|                  | Dc            | L1  | L   | Ds | L2 |             |
| J2D-420-W40-SP14 | 42.0          | 89  | 189 | 40 | 70 | SPMG 140512 |
| J2D-430-W40-SP14 | 43.0          | 91  | 191 | 40 | 70 |             |
| J2D-440-W40-SP14 | 44.0          | 93  | 193 | 40 | 70 |             |
| J2D-450-W40-SP14 | 45.0          | 95  | 195 | 40 | 70 |             |
| J2D-460-W40-SP14 | 46.0          | 97  | 197 | 40 | 70 |             |
| J2D-470-W40-SP14 | 47.0          | 99  | 199 | 40 | 70 |             |
| J2D-480-W40-SP14 | 48.0          | 101 | 201 | 40 | 70 |             |
| J2D-490-W40-SP14 | 49.0          | 103 | 203 | 40 | 70 |             |
| J2D-500-W40-SP14 | 50.0          | 105 | 205 | 40 | 70 |             |
| J2D-510-W40-SP09 | 51.0          | 107 | 207 | 40 | 70 |             |
| J2D-520-W40-SP09 | 52.0          | 109 | 209 | 40 | 70 |             |
| J2D-530-W40-SP09 | 53.0          | 111 | 211 | 40 | 70 |             |
| J2D-540-W40-SP09 | 54.0          | 113 | 213 | 40 | 70 |             |
| J2D-550-W40-SP09 | 55.0          | 115 | 215 | 40 | 70 |             |
| J2D-560-W40-SP09 | 56.0          | 120 | 222 | 40 | 70 |             |
| J2D-570-W40-SP09 | 57.0          | 122 | 224 | 40 | 70 |             |
| J2D-580-W40-SP09 | 58.0          | 124 | 226 | 40 | 70 |             |
| J2D-590-W40-SP09 | 59.0          | 126 | 228 | 40 | 70 |             |
| J2D-600-W40-SP09 | 60.0          | 128 | 230 | 40 | 70 |             |

| Screw   | Wrench  | Applicable holder                 |
|---|---|-----------------------------------|
|  |  |                                   |
| JST050110   | T20   | J2D-420-W40-SP14~J2D-500-W40-SP14 |
| JST035080   | T15   | J2D-510-W40-SP09~J2D-600-W40-SP09 |

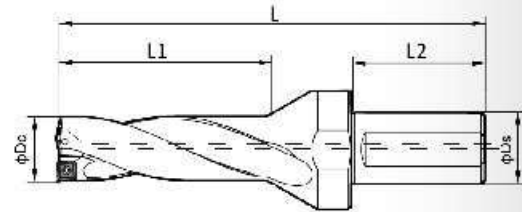
SP Series Drilling Holder  
Drilling Depth: 3D



| Designation      | Dimension(mm) |    |     |    |    | Inserts     |             |
|------------------|---------------|----|-----|----|----|-------------|-------------|
|                  | Dc            | L1 | L   | Ds | L2 |             |             |
| J3D-130-W20-SP05 | 13.0          | 42 | 101 | 20 | 44 | SPMG 050204 |             |
| J3D-135-W20-SP05 | 13.5          | 44 | 103 | 20 | 44 |             |             |
| J3D-140-W20-SP05 | 14.0          | 45 | 104 | 20 | 44 |             |             |
| J3D-145-W20-SP05 | 14.5          | 47 | 106 | 20 | 44 |             |             |
| J3D-150-W20-SP05 | 15.0          | 48 | 107 | 20 | 44 |             |             |
| J3D-155-W20-SP06 | 15.5          | 50 | 109 | 20 | 44 |             | SPMG 060204 |
| J3D-160-W20-SP06 | 16.0          | 51 | 110 | 20 | 44 |             |             |
| J3D-165-W20-SP06 | 16.5          | 53 | 112 | 20 | 44 |             |             |
| J3D-170-W20-SP06 | 17.0          | 54 | 113 | 20 | 44 |             |             |
| J3D-175-W25-SP06 | 17.5          | 56 | 127 | 25 | 56 |             |             |
| J3D-180-W25-SP06 | 18.0          | 57 | 128 | 25 | 56 |             |             |
| J3D-185-W25-SP06 | 18.5          | 59 | 130 | 25 | 56 |             |             |
| J3D-190-W25-SP06 | 19.0          | 60 | 131 | 25 | 56 |             |             |
| J3D-195-W25-SP06 | 19.5          | 62 | 133 | 25 | 56 |             |             |
| J3D-200-W25-SP06 | 20.0          | 63 | 134 | 25 | 56 | SPMG 07T308 |             |
| J3D-205-W25-SP06 | 20.5          | 65 | 136 | 25 | 56 |             |             |
| J3D-210-W25-SP06 | 21.0          | 66 | 137 | 25 | 56 |             |             |
| J3D-215-W25-SP06 | 21.5          | 68 | 139 | 25 | 56 |             |             |
| J3D-220-W25-SP07 | 22.0          | 69 | 140 | 25 | 56 |             |             |
| J3D-225-W25-SP07 | 22.5          | 71 | 142 | 25 | 56 |             |             |
| J3D-230-W25-SP07 | 23.0          | 72 | 146 | 25 | 56 |             |             |
| J3D-235-W25-SP07 | 23.5          | 74 | 148 | 25 | 56 |             |             |
| J3D-240-W25-SP07 | 24.0          | 75 | 149 | 25 | 56 |             |             |
| J3D-245-W25-SP07 | 24.5          | 77 | 151 | 25 | 56 |             |             |
| J3D-250-W25-SP07 | 25.0          | 78 | 152 | 25 | 56 |             |             |
| J3D-255-W32-SP07 | 25.5          | 80 | 160 | 32 | 60 |             |             |
| J3D-260-W32-SP07 | 26.0          | 81 | 161 | 32 | 60 |             |             |
| J3D-265-W32-SP07 | 26.5          | 83 | 163 | 32 | 60 |             |             |

| Screw   | Wrench  | Applicable holder                 |
|---|---|-----------------------------------|
|  |  |                                   |
| JST020040   | T06   | J3D-130-W20-SP05~J3D-150-W20-SP05 |
| JST022050   | T07   | J3D-155-W20-SP06~J3D-170-W20-SP06 |
| JST022050   | T07   | J3D-175-W25-SP06~J3D-215-W25-SP06 |
| JST025060   | T08   | J3D-220-W25-SP07~J3D-275-W32-SP07 |

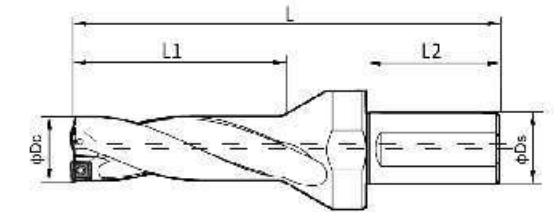
SP Series Drilling Holder  
Drilling Depth: 3D



| Designation      | Dimension(mm) |     |     |    |    | Inserts     |
|------------------|---------------|-----|-----|----|----|-------------|
|                  | Dc            | L1  | L   | Ds | L2 |             |
| J3D-270-W32-SP07 | 27.0          | 84  | 164 | 32 | 60 | SPMG 07T308 |
| J3D-275-W32-SP07 | 27.5          | 86  | 166 | 32 | 60 |             |
| J3D-280-W32-SP09 | 28.0          | 87  | 167 | 32 | 60 |             |
| J3D-285-W32-SP09 | 28.5          | 89  | 169 | 32 | 60 | SPMG 090408 |
| J3D-290-W32-SP09 | 29.0          | 91  | 172 | 32 | 60 |             |
| J3D-295-W32-SP09 | 29.5          | 93  | 174 | 32 | 60 |             |
| J3D-300-W32-SP09 | 30.0          | 94  | 178 | 32 | 60 |             |
| J3D-305-W32-SP09 | 30.5          | 96  | 180 | 32 | 60 |             |
| J3D-310-W32-SP09 | 31.0          | 97  | 181 | 32 | 60 |             |
| J3D-315-W32-SP09 | 31.5          | 99  | 183 | 32 | 60 |             |
| J3D-320-W32-SP09 | 32.0          | 100 | 184 | 32 | 60 |             |
| J3D-325-W32-SP09 | 32.5          | 102 | 186 | 32 | 60 |             |
| J3D-330-W32-SP09 | 33.0          | 103 | 187 | 32 | 60 |             |
| J3D-335-W32-SP09 | 33.5          | 105 | 189 | 32 | 60 | SPMG 110408 |
| J3D-340-W40-SP11 | 34.0          | 106 | 190 | 40 | 60 |             |
| J3D-345-W40-SP11 | 34.5          | 108 | 192 | 40 | 60 |             |
| J3D-350-W40-SP11 | 35.0          | 109 | 193 | 40 | 60 |             |
| J3D-355-W40-SP11 | 35.5          | 111 | 195 | 40 | 60 |             |
| J3D-360-W40-SP11 | 36.0          | 112 | 196 | 40 | 60 |             |
| J3D-365-W40-SP11 | 36.5          | 114 | 198 | 40 | 60 |             |
| J3D-370-W40-SP11 | 37.0          | 116 | 206 | 40 | 60 |             |
| J3D-375-W40-SP11 | 37.5          | 118 | 208 | 40 | 60 |             |
| J3D-380-W40-SP11 | 38.0          | 119 | 207 | 40 | 60 |             |
| J3D-385-W40-SP11 | 38.5          | 121 | 211 | 40 | 60 |             |
| J3D-390-W40-SP11 | 39.0          | 122 | 212 | 40 | 60 |             |
| J3D-395-W40-SP11 | 39.5          | 124 | 214 | 40 | 60 |             |
| J3D-400-W40-SP11 | 40.0          | 125 | 225 | 40 | 70 |             |
| J3D-410-W40-SP11 | 41.0          | 128 | 228 | 40 | 70 |             |

| Screw     | Wrench | Applicable holder                 |
|-----------|--------|-----------------------------------|
|           |        |                                   |
| JST025060 | T08    | J3D-220-W25-SP07~J3D-275-W32-SP07 |
| JST035080 | T15    | J3D-280-W32-SP09~J3D-335-W32-SP09 |
| JST040100 | T15    | J3D-340-W40-SP11~J3D-410-W40-SP11 |

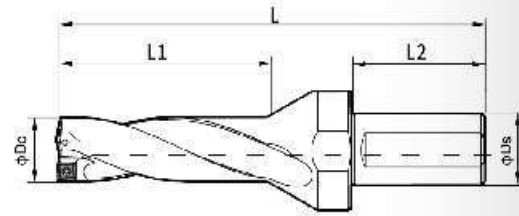
SP Series Drilling Holder  
Drilling Depth: 3D



| Designation      | Dimension(mm) |     |     |    |    | Inserts     |
|------------------|---------------|-----|-----|----|----|-------------|
|                  | Dc            | L1  | L   | Ds | L2 |             |
| J3D-420-W40-SP14 | 42.0          | 131 | 231 | 40 | 70 | SPMG 140512 |
| J3D-430-W40-SP14 | 43.0          | 134 | 234 | 40 | 70 |             |
| J3D-440-W40-SP14 | 44.0          | 137 | 237 | 40 | 70 |             |
| J3D-450-W40-SP14 | 45.0          | 140 | 240 | 40 | 70 |             |
| J3D-460-W40-SP14 | 46.0          | 143 | 243 | 40 | 70 |             |
| J3D-470-W40-SP14 | 47.0          | 146 | 246 | 40 | 70 |             |
| J3D-480-W40-SP14 | 48.0          | 149 | 249 | 40 | 70 |             |
| J3D-490-W40-SP14 | 49.0          | 152 | 252 | 40 | 70 |             |
| J3D-500-W40-SP14 | 50.0          | 155 | 255 | 40 | 70 |             |
| J3D-510-W40-SP09 | 51.0          | 158 | 258 | 40 | 70 |             |
| J3D-520-W40-SP09 | 52.0          | 161 | 261 | 40 | 70 |             |
| J3D-530-W40-SP09 | 53.0          | 164 | 264 | 40 | 70 |             |
| J3D-540-W40-SP09 | 54.0          | 167 | 267 | 40 | 70 |             |
| J3D-550-W40-SP09 | 55.0          | 170 | 270 | 40 | 70 |             |
| J3D-560-W40-SP09 | 56.0          | 176 | 278 | 40 | 70 |             |
| J3D-570-W40-SP09 | 57.0          | 179 | 281 | 40 | 70 |             |
| J3D-580-W40-SP09 | 58.0          | 182 | 284 | 40 | 70 |             |
| J3D-590-W40-SP09 | 59.0          | 185 | 287 | 40 | 70 |             |
| J3D-600-W40-SP09 | 60.0          | 188 | 290 | 40 | 70 |             |

| Screw     | Wrench | Applicable holder                 |
|-----------|--------|-----------------------------------|
|           |        |                                   |
| JST050110 | T20    | J3D-420-W40-SP14~J3D-500-W40-SP14 |
| JST035080 | T15    | J3D-510-W40-SPO9~J3D-600-W40-SP09 |

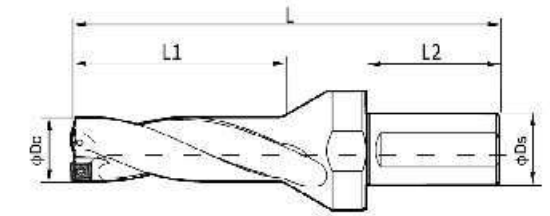
SP Series Drilling Holder  
Drilling Depth: 4D



| Designation      | Dimension(mm) |     |     |    |    | Inserts     |             |
|------------------|---------------|-----|-----|----|----|-------------|-------------|
|                  | Dc            | L1  | L   | Ds | L2 |             |             |
| J4D-130-W20-SP05 | 13.0          | 55  | 114 | 20 | 44 | SPMG 050204 |             |
| J4D-135-W20-SP05 | 13.5          | 57  | 116 | 20 | 44 |             |             |
| J4D-140-W20-SP05 | 14.0          | 59  | 118 | 20 | 44 |             |             |
| J4D-145-W20-SP05 | 14.5          | 61  | 120 | 20 | 44 |             |             |
| J4D-150-W20-SP05 | 15.0          | 63  | 122 | 20 | 44 |             |             |
| J4D-155-W20-SP06 | 15.5          | 65  | 124 | 20 | 44 |             | SPMG 060204 |
| J4D-160-W20-SP06 | 16.0          | 67  | 126 | 20 | 44 |             |             |
| J4D-165-W20-SP06 | 16.5          | 69  | 128 | 20 | 44 |             |             |
| J4D-170-W20-SP06 | 17.0          | 71  | 130 | 20 | 44 |             |             |
| J4D-175-W25-SP06 | 17.5          | 73  | 144 | 25 | 56 |             |             |
| J4D-180-W25-SP06 | 18.0          | 75  | 146 | 25 | 56 |             |             |
| J4D-185-W25-SP06 | 18.5          | 77  | 148 | 25 | 56 |             |             |
| J4D-190-W25-SP06 | 19.0          | 79  | 150 | 25 | 56 |             |             |
| J4D-195-W25-SP06 | 19.5          | 81  | 152 | 25 | 56 |             |             |
| J4D-200-W25-SP06 | 20.0          | 83  | 154 | 25 | 56 |             |             |
| J4D-205-W25-SP06 | 20.5          | 85  | 156 | 25 | 56 | SPMG 07T308 |             |
| J4D-210-W25-SP06 | 21.0          | 87  | 158 | 25 | 56 |             |             |
| J4D-215-W25-SP06 | 21.5          | 89  | 160 | 25 | 56 |             |             |
| J4D-220-W25-SP07 | 22.0          | 91  | 162 | 25 | 56 |             |             |
| J4D-225-W25-SP07 | 22.5          | 93  | 164 | 25 | 56 |             |             |
| J4D-230-W25-SP07 | 23.0          | 95  | 169 | 25 | 56 |             |             |
| J4D-235-W25-SP07 | 23.5          | 97  | 171 | 25 | 56 |             |             |
| J4D-240-W25-SP07 | 24.0          | 99  | 173 | 25 | 56 |             |             |
| J4D-245-W25-SP07 | 24.5          | 101 | 175 | 25 | 56 |             |             |
| J4D-250-W25-SP07 | 25.0          | 103 | 177 | 25 | 56 |             |             |
| J4D-255-W32-SP07 | 25.5          | 105 | 185 | 32 | 60 |             |             |
| J4D-260-W32-SP07 | 26.0          | 107 | 187 | 32 | 60 |             |             |
| J4D-265-W32-SP07 | 26.5          | 109 | 189 | 32 | 60 |             |             |

| Screw     | Wrench | Applicable holder                 |
|-----------|--------|-----------------------------------|
|           |        |                                   |
| JST020040 | T06    | J4D-130-W20-SP05~J4D-150-W20-SP05 |
| JST022050 | T06    | J4D-155-W20-SP06~J4D-170-W20-SP06 |
| JST022050 | T06    | J4D-175-W25-SP06~J4D-215-W25-SP06 |
| JST025060 | T08    | J4D-220-W25-SP07~J4D-275-W32-SP07 |

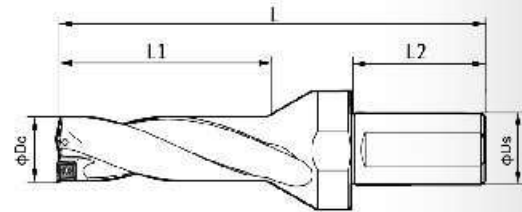
SP Series Drilling Holder  
Drilling Depth: 4D





| Designation      | Dimension(mm) |     |     |    |    | Inserts     |
|------------------|---------------|-----|-----|----|----|-------------|
|                  | Dc            | L1  | L   | Ds | L2 |             |
| J4D-270-W32-SP07 | 27.0          | 111 | 191 | 32 | 60 | SPMG 07T308 |
| J4D-275-W32-SP07 | 27.5          | 113 | 193 | 32 | 60 |             |
| J4D-280-W32-SP09 | 28.0          | 115 | 195 | 32 | 60 | SPMG 090408 |
| J4D-285-W32-SP09 | 28.5          | 117 | 197 | 32 | 60 |             |
| J4D-290-W32-SP09 | 29.0          | 120 | 201 | 32 | 60 |             |
| J4D-295-W32-SP09 | 29.5          | 122 | 203 | 32 | 60 |             |
| J4D-300-W32-SP09 | 30.0          | 124 | 208 | 32 | 60 |             |
| J4D-305-W32-SP09 | 30.5          | 126 | 210 | 32 | 60 |             |
| J4D-310-W32-SP09 | 31.0          | 128 | 212 | 32 | 60 |             |
| J4D-315-W32-SP09 | 31.5          | 130 | 214 | 32 | 60 |             |
| J4D-320-W32-SP09 | 32.0          | 132 | 216 | 32 | 60 |             |
| J4D-325-W32-SP09 | 32.5          | 134 | 218 | 32 | 60 |             |
| J4D-330-W32-SP09 | 33.0          | 136 | 220 | 32 | 60 |             |
| J4D-335-W32-SP09 | 33.5          | 138 | 222 | 32 | 60 |             |
| J4D-340-W40-SP11 | 34.0          | 140 | 224 | 40 | 60 |             |
| J4D-345-W40-SP11 | 34.5          | 142 | 226 | 40 | 60 |             |
| J4D-350-W40-SP11 | 35.0          | 144 | 228 | 40 | 60 |             |
| J4D-355-W40-SP11 | 35.5          | 146 | 230 | 40 | 60 |             |
| J4D-360-W40-SP11 | 36.0          | 148 | 232 | 40 | 60 |             |
| J4D-365-W40-SP11 | 36.5          | 150 | 234 | 40 | 60 |             |
| J4D-370-W40-SP11 | 37.0          | 153 | 243 | 40 | 60 |             |
| J4D-375-W40-SP11 | 37.5          | 155 | 245 | 40 | 60 |             |
| J4D-380-W40-SP11 | 38.0          | 157 | 247 | 40 | 60 |             |
| J4D-385-W40-SP11 | 38.5          | 159 | 249 | 40 | 60 |             |
| J4D-390-W40-SP11 | 39.0          | 161 | 251 | 40 | 60 |             |
| J4D-395-W40-SP11 | 39.5          | 163 | 253 | 40 | 60 |             |
| J4D-400-W40-SP11 | 40.0          | 165 | 265 | 40 | 70 |             |
| J4D-410-W40-SP11 | 41.0          | 169 | 269 | 40 | 70 |             |

| Screw     | Wrench | Applicable holder                 |
|-----------|--------|-----------------------------------|
|           |        |                                   |
| JST025060 | T08    | J4D-220-W25-SP07~J4D-275-W32-SP07 |
| JST035080 | T15    | J4D-280-W32-SP09~J4D-335-W32-SP09 |
| JST040100 | T15    | J4D-340-W40-SP11~J4D-410-W40-SP11 |

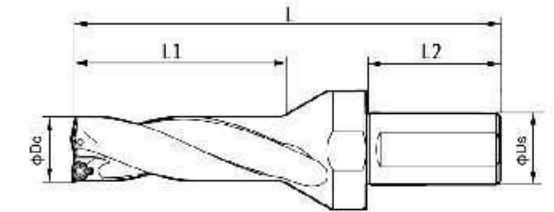
SP Series Drilling Holder  
Drilling Depth: 4D





| Designation      | Dimension(mm) |     |     |    |    | Inserts     |
|------------------|---------------|-----|-----|----|----|-------------|
|                  | Dc            | L1  | L   | Ds | L2 |             |
| J4D-420-W40-SP14 | 42.0          | 173 | 273 | 40 | 70 | SPMG 140512 |
| J4D-430-W40-SP14 | 43.0          | 177 | 277 | 40 | 70 |             |
| J4D-440-W40-SP14 | 44.0          | 181 | 281 | 40 | 70 |             |
| J4D-450-W40-SP14 | 45.0          | 185 | 285 | 40 | 70 |             |
| J4D-460-W40-SP14 | 46.0          | 189 | 289 | 40 | 70 |             |
| J4D-470-W40-SP14 | 47.0          | 193 | 293 | 40 | 70 |             |
| J4D-480-W40-SP14 | 48.0          | 197 | 297 | 40 | 70 |             |
| J4D-490-W40-SP14 | 49.0          | 201 | 301 | 40 | 70 |             |
| J4D-500-W40-SP14 | 50.0          | 205 | 305 | 40 | 70 |             |
| J4D-510-W40-SP09 | 51.0          | 209 | 309 | 40 | 70 |             |
| J4D-520-W40-SP09 | 52.0          | 213 | 313 | 40 | 70 |             |
| J4D-530-W40-SP09 | 53.0          | 217 | 317 | 40 | 70 |             |
| J4D-540-W40-SP09 | 54.0          | 221 | 321 | 40 | 70 |             |
| J4D-550-W40-SP09 | 55.0          | 225 | 325 | 40 | 70 |             |
| J4D-560-W40-SP09 | 56.0          | 232 | 334 | 40 | 70 |             |
| J4D-570-W40-SP09 | 57.0          | 236 | 338 | 40 | 70 |             |
| J4D-580-W40-SP09 | 58.0          | 240 | 342 | 40 | 70 |             |
| J4D-590-W40-SP09 | 59.0          | 244 | 346 | 40 | 70 |             |
| J4D-600-W40-SP09 | 60.0          | 248 | 350 | 40 | 70 |             |

| Screw   | Wrench  | Applicable holder                 |
|---|---|-----------------------------------|
|  |  |                                   |
| JST050110   | T20   | J4D-420-W40-SP14~J4D-500-W40-SP14 |
| JST035080   | T15   | J4D-510-W40-SP09~J4D-600-W40-SP09 |

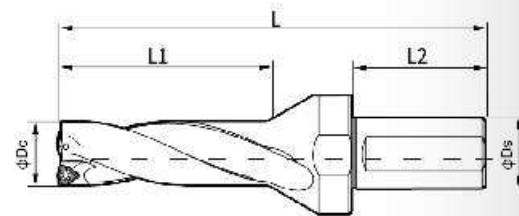
WC Series Drilling Holder  
Drilling Depth: 2D



| Designation      | Dimension(mm) |    |     |    |    | Inserts     |
|------------------|---------------|----|-----|----|----|-------------|
|                  | Dc            | L1 | L   | Ds | L2 |             |
| J2D-150-W20-WC03 | 15.0          | 33 | 92  | 20 | 44 | WCMT 030208 |
| J2D-155-W20-WC03 | 15.5          | 34 | 93  | 20 | 44 |             |
| J2D-160-W20-WC03 | 16.0          | 35 | 94  | 20 | 44 |             |
| J2D-165-W20-WC03 | 16.5          | 36 | 95  | 20 | 44 |             |
| J2D-170-W20-WC03 | 17.0          | 37 | 96  | 20 | 44 |             |
| J2D-175-W25-WC03 | 17.5          | 38 | 109 | 25 | 56 |             |
| J2D-180-W25-WC03 | 18.0          | 39 | 110 | 25 | 56 |             |
| J2D-185-W25-WC03 | 18.5          | 40 | 111 | 25 | 56 |             |
| J2D-190-W25-WC03 | 19.0          | 41 | 112 | 25 | 56 |             |
| J2D-195-W25-WC03 | 19.5          | 42 | 113 | 25 | 56 |             |
| J2D-200-W25-WC03 | 20.0          | 43 | 114 | 25 | 56 | WCMT 040208 |
| J2D-205-W25-WC03 | 20.5          | 44 | 115 | 25 | 56 |             |
| J2D-210-W25-WC04 | 21.0          | 45 | 116 | 25 | 56 |             |
| J2D-215-W25-WC04 | 21.5          | 46 | 117 | 25 | 56 |             |
| J2D-220-W25-WC04 | 22.0          | 47 | 118 | 25 | 56 |             |
| J2D-225-W25-WC04 | 22.5          | 48 | 119 | 25 | 56 |             |
| J2D-230-W25-WC04 | 23.0          | 49 | 123 | 25 | 56 |             |
| J2D-235-W25-WC04 | 23.5          | 50 | 124 | 25 | 56 |             |
| J2D-240-W25-WC04 | 24.0          | 51 | 125 | 25 | 56 |             |
| J2D-245-W25-WC04 | 24.5          | 52 | 126 | 25 | 56 |             |
| J2D-250-W25-WC05 | 25.0          | 53 | 127 | 25 | 56 | WCMT 050308 |
| J2D-255-W32-WC05 | 25.5          | 54 | 134 | 32 | 60 |             |
| J2D-260-W32-WC05 | 26.0          | 55 | 135 | 32 | 60 |             |
| J2D-265-W32-WC05 | 26.5          | 56 | 136 | 32 | 60 |             |
| J2D-270-W32-WC05 | 27.0          | 57 | 137 | 32 | 60 |             |
| J2D-275-W32-WC05 | 27.5          | 58 | 138 | 32 | 60 |             |
| J2D-280-W32-WC05 | 28.0          | 59 | 139 | 32 | 60 |             |
| J2D-285-W32-WC05 | 28.5          | 60 | 140 | 32 | 60 |             |
| J2D-290-W32-WC05 | 29.0          | 62 | 143 | 32 | 60 |             |
| J2D-295-W32-WC05 | 29.5          | 63 | 144 | 32 | 60 |             |

| Screw   | Wrench  | Applicable holder                 |
|---|---|-----------------------------------|
|  |  |                                   |
| JST025060   | T08   | J2D-150-W20-WC03~J2D-205-W25-WC03 |
| JST025060   | T08   | J2D-210-W25-WC04~J2D-245-W25-WC04 |
| JST030080   | T08   | J2D-250-W25-WC05~J2D-305-W32-WC05 |

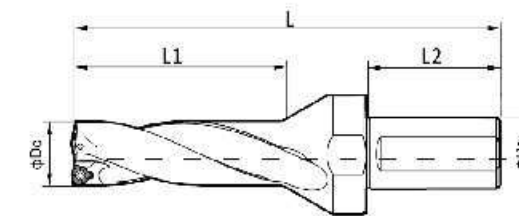
WC Series Drilling Holder  
Drilling Depth: 2D



| Designation      | Dimension(mm) |     |     |    |    | Inserts     |             |
|------------------|---------------|-----|-----|----|----|-------------|-------------|
|                  | Dc            | L1  | L   | Ds | L2 |             |             |
| J2D-300-W32-WC05 | 30.0          | 64  | 148 | 32 | 60 | WCMT 050308 |             |
| J2D-305-W32-WC05 | 30.5          | 65  | 149 | 32 | 60 |             |             |
| J2D-310-W32-WC06 | 31.0          | 66  | 150 | 32 | 60 |             |             |
| J2D-315-W32-WC06 | 31.5          | 67  | 151 | 32 | 60 | WCMT 06T308 |             |
| J2D-320-W32-WC06 | 32.0          | 68  | 152 | 32 | 60 |             |             |
| J2D-325-W32-WC06 | 32.5          | 69  | 153 | 32 | 60 |             |             |
| J2D-330-W32-WC06 | 33.0          | 70  | 154 | 32 | 60 |             |             |
| J2D-335-W32-WC06 | 33.5          | 71  | 155 | 32 | 60 |             |             |
| J2D-340-W32-WC06 | 34.0          | 72  | 156 | 32 | 60 |             |             |
| J2D-345-W32-WC06 | 34.5          | 73  | 157 | 32 | 60 |             |             |
| J2D-350-W32-WC06 | 35.0          | 74  | 158 | 32 | 60 | WCMT 06T308 |             |
| J2D-355-W32-WC06 | 35.5          | 75  | 159 | 32 | 60 |             |             |
| J2D-360-W32-WC06 | 36.0          | 76  | 160 | 32 | 60 |             |             |
| J2D-365-W32-WC06 | 36.5          | 77  | 161 | 32 | 60 |             |             |
| J2D-370-W32-WC06 | 37.0          | 79  | 169 | 32 | 60 |             |             |
| J2D-375-W32-WC06 | 37.5          | 80  | 170 | 32 | 60 |             |             |
| J2D-380-W32-WC06 | 38.0          | 81  | 171 | 32 | 60 |             |             |
| J2D-385-W32-WC06 | 38.5          | 82  | 172 | 32 | 60 |             |             |
| J2D-390-W32-WC06 | 39.0          | 83  | 173 | 32 | 60 |             |             |
| J2D-395-W32-WC06 | 39.5          | 84  | 174 | 32 | 60 |             |             |
| J2D-400-W40-WC06 | 40.0          | 85  | 185 | 40 | 70 |             |             |
| J2D-410-W40-WC06 | 41.0          | 87  | 187 | 40 | 70 |             |             |
| J2D-420-W40-WC08 | 42.0          | 89  | 189 | 40 | 70 |             | WCMT 080412 |
| J2D-430-W40-WC08 | 43.0          | 91  | 191 | 40 | 70 |             |             |
| J2D-440-W40-WC08 | 44.0          | 93  | 193 | 40 | 70 |             |             |
| J2D-450-W40-WC08 | 45.0          | 95  | 195 | 40 | 70 |             |             |
| J2D-460-W40-WC08 | 46.0          | 97  | 197 | 40 | 70 |             |             |
| J2D-470-W40-WC08 | 47.0          | 99  | 199 | 40 | 70 |             |             |
| J2D-480-W40-WC08 | 48.0          | 101 | 201 | 40 | 70 |             |             |
| J2D-490-W40-WC08 | 49.0          | 103 | 203 | 40 | 70 |             |             |

| Screw     | Wrench | Applicable holder                 |
|-----------|--------|-----------------------------------|
|           |        |                                   |
| JST030080 | T08    | J2D-250-W25-WC05~J2D-305-W32-WC05 |
| JST035080 | T15    | J2D-310-W32-WC06~J2D-410-W40-WC06 |
| JST040100 | T15    | J2D-420-W40-WC08~J2D-600-W40-WC08 |

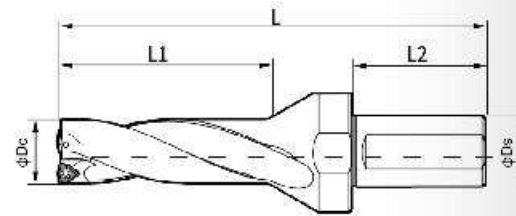
WC Series Drilling Holder  
Drilling Depth: 2D



| Designation      | Dimension(mm) |     |     |    |    | Inserts     |
|------------------|---------------|-----|-----|----|----|-------------|
|                  | Dc            | L1  | L   | Ds | L2 |             |
| J2D-500-W40-WC08 | 50.0          | 105 | 205 | 40 | 70 | WCMT 080412 |
| J2D-510-W40-WC08 | 51.0          | 107 | 207 | 40 | 70 |             |
| J2D-520-W40-WC08 | 52.0          | 109 | 209 | 40 | 70 |             |
| J2D-530-W40-WC08 | 53.0          | 111 | 211 | 40 | 70 |             |
| J2D-540-W40-WC08 | 54.0          | 113 | 213 | 40 | 70 |             |
| J2D-550-W40-WC08 | 55.0          | 115 | 215 | 40 | 70 |             |
| J2D-560-W40-WC08 | 56.0          | 120 | 222 | 40 | 70 |             |
| J2D-570-W40-WC08 | 57.0          | 122 | 224 | 40 | 70 |             |
| J2D-580-W40-WC08 | 58.0          | 124 | 226 | 40 | 70 |             |
| J2D-590-W40-WC08 | 59.0          | 126 | 228 | 40 | 70 |             |
| J2D-600-W40-WC08 | 60.0          | 128 | 230 | 40 | 70 |             |
|                  |               |     |     |    |    |             |
|                  |               |     |     |    |    |             |
|                  |               |     |     |    |    |             |
|                  |               |     |     |    |    |             |
|                  |               |     |     |    |    |             |
|                  |               |     |     |    |    |             |
|                  |               |     |     |    |    |             |
|                  |               |     |     |    |    |             |
|                  |               |     |     |    |    |             |
|                  |               |     |     |    |    |             |
|                  |               |     |     |    |    |             |
|                  |               |     |     |    |    |             |

| Screw     | Wrench | Applicable holder                 |
|-----------|--------|-----------------------------------|
|           |        |                                   |
| JST040100 | T15    | J2D-420-W40-WC08~J2D-600-W40-WC08 |

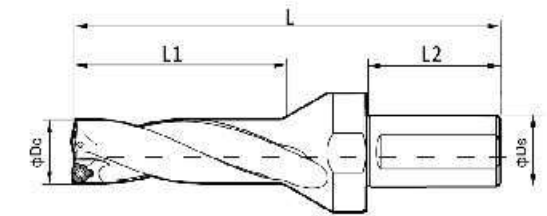
WC Series Drilling Holder  
Drilling Depth: 3D



| Designation      | Dimension(mm) |    |     |    |    | Inserts     |             |
|------------------|---------------|----|-----|----|----|-------------|-------------|
|                  | Dc            | L1 | L   | Ds | L2 |             |             |
| J3D-150-W20-WC03 | 15.0          | 48 | 107 | 20 | 44 | WCMT 030208 |             |
| J3D-155-W20-WC03 | 15.5          | 50 | 109 | 20 | 44 |             |             |
| J3D-160-W20-WC03 | 16.0          | 51 | 110 | 20 | 44 |             |             |
| J3D-165-W20-WC03 | 16.5          | 53 | 112 | 20 | 44 |             |             |
| J3D-170-W20-WC03 | 17.0          | 54 | 113 | 20 | 44 |             |             |
| J3D-175-W25-WC03 | 17.5          | 56 | 127 | 25 | 56 |             |             |
| J3D-180-W25-WC03 | 18.0          | 57 | 128 | 25 | 56 |             |             |
| J3D-185-W25-WC03 | 18.5          | 59 | 130 | 25 | 56 |             |             |
| J3D-190-W25-WC03 | 19.0          | 60 | 131 | 25 | 56 |             |             |
| J3D-195-W25-WC03 | 19.5          | 62 | 133 | 25 | 56 |             |             |
| J3D-200-W25-WC03 | 20.0          | 63 | 134 | 25 | 56 |             |             |
| J3D-205-W25-WC03 | 20.5          | 65 | 136 | 25 | 56 |             |             |
| J3D-210-W25-WC04 | 21.0          | 66 | 137 | 25 | 56 |             | WCMT 040208 |
| J3D-215-W25-WC04 | 21.5          | 68 | 139 | 25 | 56 |             |             |
| J3D-220-W25-WC04 | 22.0          | 69 | 140 | 25 | 56 |             |             |
| J3D-225-W25-WC04 | 22.5          | 71 | 142 | 25 | 56 |             |             |
| J3D-230-W25-WC04 | 23.0          | 72 | 146 | 25 | 56 |             |             |
| J3D-235-W25-WC04 | 23.5          | 74 | 148 | 25 | 56 |             |             |
| J3D-240-W25-WC04 | 24.0          | 75 | 149 | 25 | 56 |             |             |
| J3D-245-W25-WC04 | 24.5          | 77 | 151 | 25 | 56 |             |             |
| J3D-250-W25-WC05 | 25.0          | 78 | 152 | 25 | 56 | WCMT 050308 |             |
| J3D-255-W32-WC05 | 25.5          | 80 | 160 | 32 | 60 |             |             |
| J3D-260-W32-WC05 | 26.0          | 81 | 161 | 32 | 60 |             |             |
| J3D-265-W32-WC05 | 26.5          | 83 | 163 | 32 | 60 |             |             |
| J3D-270-W32-WC05 | 27.0          | 84 | 164 | 32 | 60 |             |             |
| J3D-275-W32-WC05 | 27.5          | 86 | 166 | 32 | 60 |             |             |
| J3D-280-W32-WC05 | 28.0          | 87 | 167 | 32 | 60 |             |             |
| J3D-285-W32-WC05 | 28.5          | 89 | 169 | 32 | 60 |             |             |
| J3D-290-W32-WC05 | 29.0          | 91 | 172 | 32 | 60 |             |             |
| J3D-295-W32-WC05 | 29.5          | 93 | 174 | 32 | 60 |             |             |

| Screw     | Wrench | Applicable holder                 |
|-----------|--------|-----------------------------------|
|           |        |                                   |
| JST025060 | T08    | J3D-150-W20-WC03~J3D-205-W25-WC03 |
| JST025060 | T08    | J3D-210-W25-WC04~J3D-245-W25-WC04 |
| JST030080 | T08    | J3D-250-W25-WC05~J3D-305-W32-WC05 |

WC Series Drilling Holder  
Drilling Depth: 3D



| Designation      | Dimension(mm) |     |     |    |    | Inserts     |             |
|------------------|---------------|-----|-----|----|----|-------------|-------------|
|                  | Dc            | L1  | L   | Ds | L2 |             |             |
| J3D-300-W32-WC05 | 30.0          | 94  | 178 | 32 | 60 | WCMT 050308 |             |
| J3D-305-W32-WC05 | 30.5          | 96  | 180 | 32 | 60 |             |             |
| J3D-310-W32-WC06 | 31.0          | 97  | 181 | 32 | 60 | WCMT 06T308 |             |
| J3D-315-W32-WC06 | 31.5          | 99  | 183 | 32 | 60 |             |             |
| J3D-320-W32-WC06 | 32.0          | 100 | 184 | 32 | 60 |             |             |
| J3D-325-W32-WC06 | 32.5          | 102 | 186 | 32 | 60 |             |             |
| J3D-330-W32-WC06 | 33.0          | 103 | 187 | 32 | 60 |             |             |
| J3D-335-W32-WC06 | 33.5          | 105 | 189 | 32 | 60 |             |             |
| J3D-340-W32-WC06 | 34.0          | 106 | 190 | 32 | 60 |             |             |
| J3D-345-W32-WC06 | 34.5          | 108 | 192 | 32 | 60 |             |             |
| J3D-350-W32-WC06 | 35.0          | 109 | 193 | 32 | 60 |             |             |
| J3D-355-W32-WC06 | 35.5          | 111 | 195 | 32 | 60 |             |             |
| J3D-360-W32-WC06 | 36.0          | 112 | 196 | 32 | 60 | WCMT 06T308 |             |
| J3D-365-W32-WC06 | 36.5          | 114 | 198 | 32 | 60 |             |             |
| J3D-370-W32-WC06 | 37.0          | 116 | 206 | 32 | 60 |             |             |
| J3D-375-W32-WC06 | 37.5          | 118 | 208 | 32 | 60 |             |             |
| J3D-380-W32-WC06 | 38.0          | 119 | 209 | 32 | 60 |             |             |
| J3D-385-W32-WC06 | 38.5          | 121 | 211 | 32 | 60 |             |             |
| J3D-390-W32-WC06 | 39.0          | 122 | 212 | 32 | 60 |             |             |
| J3D-395-W32-WC06 | 39.5          | 124 | 214 | 32 | 60 |             |             |
| J3D-400-W40-WC06 | 40.0          | 125 | 225 | 40 | 70 |             | WCMT 080412 |
| J3D-410-W40-WC06 | 41.0          | 128 | 228 | 40 | 70 |             |             |
| J3D-420-W40-WC08 | 42.0          | 131 | 231 | 40 | 70 |             |             |
| J3D-430-W40-WC08 | 43.0          | 134 | 234 | 40 | 70 |             |             |
| J3D-440-W40-WC08 | 44.0          | 137 | 237 | 40 | 70 |             |             |
| J3D-450-W40-WC08 | 45.0          | 140 | 240 | 40 | 70 |             |             |
| J3D-460-W40-WC08 | 46.0          | 143 | 243 | 40 | 70 |             |             |
| J3D-470-W40-WC08 | 47.0          | 146 | 246 | 40 | 70 |             |             |
| J3D-480-W40-WC08 | 48.0          | 149 | 249 | 40 | 70 |             |             |
| J3D-490-W40-WC08 | 49.0          | 152 | 252 | 40 | 70 |             |             |

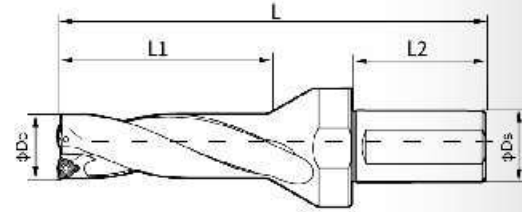
| Screw     | Wrench | Applicable holder                 |
|-----------|--------|-----------------------------------|
|           |        |                                   |
| JST030080 | T08    | J3D-250-W25-WC05~J3D-305-W32-WC05 |
| JST035080 | T15    | J3D-310-W32-WC06~J3D-410-W40-WC06 |
| JST040100 | T15    | J3D-420-W40-WC08~J3D-600-W40-WC08 |







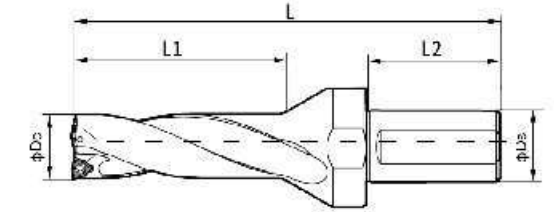
WC Series Drilling Holder  
Drilling Depth: 5D



| Designation      | Dimension(mm) |     |     |    |    | Inserts     |             |
|------------------|---------------|-----|-----|----|----|-------------|-------------|
|                  | Dc            | L1  | L   | Ds | L2 |             |             |
| J5D-160-W20-WC03 | 16.0          | 83  | 142 | 20 | 44 | WCMT 030208 |             |
| J5D-165-W20-WC03 | 16.5          | 86  | 145 | 20 | 44 |             |             |
| J5D-170-W20-WC03 | 17.0          | 88  | 147 | 20 | 44 |             |             |
| J5D-175-W25-WC03 | 17.5          | 91  | 150 | 25 | 56 |             |             |
| J5D-180-W25-WC03 | 18.0          | 93  | 152 | 25 | 56 |             |             |
| J5D-185-W25-WC03 | 18.5          | 96  | 155 | 25 | 56 |             |             |
| J5D-190-W25-WC03 | 19.0          | 98  | 157 | 25 | 56 |             |             |
| J5D-195-W25-WC03 | 19.5          | 101 | 160 | 25 | 56 |             |             |
| J5D-200-W25-WC03 | 20.0          | 103 | 162 | 25 | 56 |             |             |
| J5D-205-W25-WC03 | 20.5          | 106 | 165 | 25 | 56 |             |             |
| J5D-210-W25-WC04 | 21.0          | 108 | 167 | 25 | 56 | WCMT 040208 |             |
| J5D-215-W25-WC04 | 21.5          | 111 | 170 | 25 | 56 |             |             |
| J5D-220-W25-WC04 | 22.0          | 113 | 172 | 25 | 56 |             |             |
| J5D-225-W25-WC04 | 22.5          | 116 | 175 | 25 | 56 |             |             |
| J5D-230-W25-WC04 | 23.0          | 118 | 180 | 25 | 56 |             |             |
| J5D-235-W25-WC04 | 23.5          | 121 | 183 | 25 | 56 |             |             |
| J5D-240-W25-WC04 | 24.0          | 123 | 185 | 25 | 56 |             |             |
| J5D-245-W25-WC04 | 24.5          | 126 | 188 | 25 | 56 |             |             |
| J5D-250-W25-WC05 | 25.0          | 128 | 190 | 25 | 56 |             | WCMT 050308 |
| J5D-255-W32-WC05 | 25.5          | 131 | 213 | 32 | 60 |             |             |
| J5D-260-W32-WC05 | 26.0          | 133 | 216 | 32 | 60 |             |             |
| J5D-265-W32-WC05 | 26.5          | 136 | 217 | 32 | 60 |             |             |
| J5D-270-W32-WC05 | 27.0          | 138 | 218 | 32 | 60 |             |             |
| J5D-275-W32-WC05 | 27.5          | 141 | 221 | 32 | 60 |             |             |
| J5D-280-W32-WC05 | 28.0          | 143 | 223 | 32 | 60 |             |             |
| J5D-285-W32-WC05 | 28.5          | 146 | 226 | 32 | 60 |             |             |
| J5D-290-W32-WC05 | 29.0          | 149 | 230 | 32 | 60 |             |             |
| J5D-295-W32-WC05 | 29.5          | 151 | 233 | 32 | 60 |             |             |
| J5D-300-W32-WC05 | 30.0          | 154 | 238 | 32 | 60 | WCMT 080412 |             |
| J5D-305-W32-WC05 | 30.5          | 157 | 241 | 32 | 60 |             |             |

| Screw     | Wrench | Applicable holder                 |
|-----------|--------|-----------------------------------|
|           |        |                                   |
| JST025060 | T08    | J5D-160-W20-WC03~J5D-205-W25-WC03 |
| JST025060 | T08    | J5D-210-W25-WC04~J5D-245-W25-WC04 |
| JST030080 | T08    | J5D-250-W25-WC05~J5D-305-W32-WC05 |

WC Series Drilling Holder  
Drilling Depth: 5D



| Designation      | Dimension(mm) |     |     |    |    | Inserts     |             |
|------------------|---------------|-----|-----|----|----|-------------|-------------|
|                  | Dc            | L1  | L   | Ds | L2 |             |             |
| J5D-310-W32-WC06 | 31.0          | 159 | 243 | 32 | 60 | WCMT 06T308 |             |
| J5D-315-W32-WC06 | 31.5          | 162 | 245 | 32 | 60 |             |             |
| J5D-320-W32-WC06 | 32.0          | 164 | 248 | 32 | 60 |             |             |
| J5D-325-W32-WC06 | 32.5          | 167 | 251 | 32 | 60 |             |             |
| J5D-330-W32-WC06 | 33.0          | 169 | 253 | 32 | 60 |             |             |
| J5D-335-W32-WC06 | 33.5          | 172 | 255 | 32 | 60 |             |             |
| J5D-340-W32-WC06 | 34.0          | 174 | 258 | 32 | 60 |             | WCMT 06T308 |
| J5D-345-W32-WC06 | 34.5          | 177 | 261 | 32 | 60 |             |             |
| J5D-350-W32-WC06 | 35.0          | 179 | 263 | 32 | 60 |             |             |
| J5D-355-W32-WC06 | 35.5          | 182 | 265 | 32 | 60 |             |             |
| J5D-360-W32-WC06 | 36.0          | 184 | 268 | 32 | 60 |             |             |
| J5D-365-W32-WC06 | 36.5          | 187 | 271 | 32 | 60 |             |             |
| J5D-370-W32-WC06 | 37.0          | 190 | 280 | 32 | 60 |             |             |
| J5D-375-W32-WC06 | 37.5          | 193 | 283 | 32 | 60 |             |             |
| J5D-380-W32-WC06 | 38.0          | 195 | 285 | 32 | 60 | WCMT 080412 |             |
| J5D-385-W32-WC06 | 38.5          | 198 | 288 | 32 | 60 |             |             |
| J5D-390-W32-WC06 | 39.0          | 200 | 290 | 32 | 60 |             |             |
| J5D-395-W32-WC06 | 39.5          | 203 | 293 | 32 | 60 |             |             |
| J5D-400-W40-WC06 | 40.0          | 205 | 305 | 40 | 70 |             |             |
| J5D-410-W40-WC06 | 41.0          | 210 | 310 | 40 | 70 |             |             |
| J5D-420-W40-WC08 | 42.0          | 215 | 315 | 40 | 70 |             |             |
| J5D-430-W40-WC08 | 43.0          | 220 | 320 | 40 | 70 |             |             |
| J5D-440-W40-WC08 | 44.0          | 225 | 325 | 40 | 70 |             |             |
| J5D-450-W40-WC08 | 45.0          | 230 | 330 | 40 | 70 |             |             |
| J5D-460-W40-WC08 | 46.0          | 235 | 335 | 40 | 70 |             |             |
| J5D-470-W40-WC08 | 47.0          | 240 | 340 | 40 | 70 |             |             |
| J5D-480-W40-WC08 | 48.0          | 245 | 345 | 40 | 70 |             |             |
| J5D-490-W40-WC08 | 49.0          | 250 | 350 | 40 | 70 |             |             |

| Screw     | Wrench | Applicable holder                 |
|-----------|--------|-----------------------------------|
|           |        |                                   |
| JST035080 | T15    | J5D-310-W32-WC06~J5D-410-W40-WC06 |
| JST040100 | T15    | J5D-420-W40-WC08~J5D-600-W40-WC08 |



Precautions For Safe Use Of Cutting Tools

| Project                        | Risk  | Safeguard Procedures  |
|--------------------------------|---|---|
| Common cutting tool            | Direct contact with the sharp edge of the cutting tool may cause injury to the human body.  | When you install or remove cutting tools on the machine, use protective labor protection such as gloves.  |
|                                | Improper use of the tool can lead to its breakage, splashes, causing damage.  | Read samples and safety standards before use. Please use protective glasses and clothing.   |
|                                | Excessive wear and severe impact increase the cutting resistance, which may cause the tool to break and splash, causing injury to the operator.     | Replace excessively worn tools in time. Please use protective glasses and clothing.   |
|                                | The chips in the cutting process may cause burns and scratches to people.   | Use tools such as pliers to remove chips. Please use protective glasses, clothing and gloves.   |
|                                | The sparks and hot chips generated during the cutting process pose a risk of fire and explosion.  | Remove flammable and explosive materials from the cutting area. Please prepare fire extinguishing equipment.  |
|                                | The machine tool running at high speed will cause severe vibration due to the poor balance of the fixture and so on, resulting in tool damage.      | Before cutting, check the equipment for loose or abnormal sounds. Please use protective glasses and clothing.   |
|                                | Burrs and other defects on the workpiece are very sharp and can easily scratch the human body.  | Please do not touch the burrs on the workpiece. Use protective gloves and clothing.   |
|                                | Direct machining without clamping the workpiece will cause tool damage and spatter of the workpiece.  | The workpiece must be firmly clamped. Please use protective glasses and clothing.   |
| Indexable Cutting Tool         | Cutting when the insert or insert attachment is not properly secured, there is a risk that the tool will fall off and fly out causing injury.       | Before processing, ensure that the inserts and other accessories are properly fastened with the appropriate tools.  |
|                                | There is a risk that the insert or knife will break and splash when over-tightened with auxiliary tools such as bolts or platens.                   | Do not use auxiliary tools such as bushings to tighten them excessively.  |
|                                | Inserts or accessories may fall off and fly out due to inertial centrifugal force when cutting at high speed.                                       | Use knives within recommended limits. Please use protective glasses and clothing.   |
| Milling and other rotary tools | Because of the sharp edge of the milling tool, there is a risk of scratches if you touch it directly with your hand.                                | For your safety, wear protective gloves if you have to touch the insert.  |
|                                | In rotary cutting, clothes, gloves, etc., are easy to be twisted onto high-speed equipment, causing casualties.                                     | When you are performing rotary cutting, please do not wear gloves processing. Always be careful not to let clothes, etc. touch the running machine parts. |
|                                | Eccentric rotating or poorly balanced tools will produce shaking vibration during rotating processing, causing damage and flying leading to injury. | Use the tool within the allowable speed range. Check the balance of the machine regularly.  |
|                                | In high-speed cutting, high-speed flying chips may cause injury.  | Use safety cover, protective screen, outer cover, etc. Please use protective glasses, protective clothing and gloves.                                     |
| Others                         | Use outside the specified purpose can lead to accelerated damage to machine tools and tools, and cause other hazards.                               | Use according to the instructions and regulations.  |
|                                | The use of a tool in a non-stationary state is very dangerous and may cause damage to the tool or machine.  | Use the tools as recommended.   |

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## Technical Information

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Turning Grade Comparison Table

| Classification | WORLDIA | SANDVIK | KENAMETAL | SECO    | WALTER  | ISCAR   | TAEGUTEC | MITSUBISHI | TUNGALOY | KYOCERA | SUMITOMO | ZCC.CT  | Achteck |
|----------------|---------|---------|-----------|---------|---------|---------|----------|------------|----------|---------|----------|---------|---------|
| P10            | WT8010  | GC4415  | KCP10     | TP1501  | WPP10S  | IC8150  | TT8115   | MC6015     | T9215    | CA115P  | AC8015P  | YBC152  | AC152P  |
|                |         | GC4325  |           | TP1500  | WPP10   |         |          | UE6110     | T9115    | CA5515  | AC810P   | YBC151  |         |
|                | WT8020  | GC4425  | KCP25     | TP2501  | WPP20S  | IC8250  | TT8125   | MC6025     | T9125    | CA125P  | AC8025P  | YBC251  | AC250P  |
| P20            | WT8020  | GC4225  | KC9215    | TP2500  | WPP20   |         |          | UE6020     | T9025    | CA5525  | AC820P   | YBC252  |         |
|                |         | WT8030  | GC4335    | KCP30   | TP3500  | WPP30S  | IC8350   | TT8135     | MC6035   | T9135   | CA5535   | AC8035P | YBC351  |
| P30            | WT8030  | GC4235  |           |         | WPP30   |         | TT8020*  |            | T9035    |         | AC830P   | YBC352  |         |
|                |         | WT3310* | GC1105*   | KC5010* | TH1000* | WSM10*  | IC907*   | TT5080*    | VP10RT*  | AH120*  | PR1305*  | AC510U* | YBG102* |
| M10            | WT5015* |         |           | CP200*  | WSM10S* | IC807*  |          | MP7015*    |          | PR1310* |          | YBG105* |         |
|                |         |         |           |         |         |         |          |            |          | PR1215* |          |         |         |
| M20            | WT3330* | GC1115* | KCU25*    | CP500*  | WSM20*  | IC908*  | TT9080*  | VP15TF*    | AH725*   | PR930*  | AC520U*  | YBG202* | AP200U* |
|                |         | WT5025* | GC15*     | KC5525* | WSM20S* | IC808*  | TT9030   | MP7025*    | AH130*   | RP1225* |          | YBG212* | AP301M* |
| M30            | WT5030* |         |           |         |         |         |          |            |          | PR1325* |          | YBG205* |         |
|                |         | WT5035* | GC1125*   | KCM35B  | CP600*  | WSM30S* | IC830*   | TT8020*    | MP7035*  | AH645*  | PR1535*  | AC6040* | AP351M* |
| K10            | WT4015  | GC3205  | KCK05     | TK1001  | WKK10S  | IC5005  | TT7005   | MC5005     | T505     | CA4505  | AC405K   | YBD052  | AC102K  |
|                |         | GC3005  | KCK05B    | TK1000  | WAK10   |         |          | UC5105     |          | CA4010  | AC410K   |         |         |
| K20            | WT4020  | GC3210  | KCK15     | TK2001  | WKK20S  | IC5010  | TT7310   | MC5015     | T5115    | CA4515  | AC415K   | YBD152C | AC202K  |
|                |         | GC3215  | KC9315    | TK2000  | WAK20   | IC428   | TT7015   | UC5115     | T515     | CA415   | AC700G   | YBD152  | ACK15A  |
| S10            | WT3310* | GCS05F  | KCU10*    | TH1000* | WSM10*  | IC807*  | TT5080*  | VP10RT*    | AH110*   | PR1305* | AC503U*  | YBG102* | AP100S* |
|                |         | WT5015* | GC1105*   | KC5510* | TH1500* | IC907*  |          | MP9005*    | AH905*   | PR1310* | AC510U*  | YBG105* |         |
| S20            | WT3330* | GC15*   | KCU20*    | CP500*  | WSM20*  | IC808*  | TT9080*  | VP15TF*    | AH120*   | PR1425* | AC520U*  | YBG212* | AP301M* |
|                |         | GC1115* | KC5525*   | KC5025* |         | IC908*  |          | MP9015*    | AH8015*  | PR1225* |          | YBG202* | YBG205* |
| N10            | H10     | K68     | KX        | WK1     | IC20    | K10     | HT10     | TH10       | KW10     | H1      | YD101    | AW100K  |         |
|                |         | K313    |           |         |         |         |          |            |          |         |          |         |         |

\*\*Indicates the grade of PVD coating. The brand information of each manufacturer comes from public information. The data is for reference only and subject to the actual product information.

Turning Chip breaker Comparison Table

| Classification | Application       | WORLDIA | SANDVIK | KENAMETAL | SECO    | WALTER | ISCAR   | TAEGUTEC | MITSUBISHI | TUNGALOY | SUMITOMO | KYOCERA | KORLOY  | ZCC.CT | Achteck |         |
|----------------|-------------------|---------|---------|-----------|---------|--------|---------|----------|------------|----------|----------|---------|---------|--------|---------|---------|
| P              | Finishing         |         | QF      | FF, FS    | FF1     | FP5    | SF      | FA, FS   | FH         | TF,ZF    | FA,FL    | DP, GP  | HU, VL  | WGF    | PB1     |         |
|                |                   |         |         | FP, LF    | FF2     | NF3    | NF      | FG,FM    | LP, SH     | TS,TSF   | SU,SE    | XF, XP  | VG, VF  | SF,NF  |         |         |
| P              | Semi-finishing    |         | PF, XF  |           |         | NS6    |         | FC, FT   | SA         |          | LU       | CQ, PQ  | VB, VC  | NM     | PB3     |         |
|                |                   |         |         |           |         |        |         |          |            |          |          |         |         |        |         |         |
| P              | Medium processing | MP      | PM, XM  | FM        | MF3     | MP5    | M3P     | PC       | MP, MV     | TM       | GE, GU   | PG, PS  | VM, HS  | PM     | PC3     |         |
|                |                   |         | HM      | MP, RP    | M3      | NM4    |         | MA       |            |          |          | UX, UG  | HS, CS  | HM, GM |         | DM      |
| P              | Roughing          | RP      | PR      | RN        | M5, MR7 | NR4    | NR, R3P | RT       | GH, RP     | TH       | MU, MX   | PT, GT  | HR, GR  | DR     | PD5     |         |
|                |                   |         | M6      | RP5       |         |        |         |          |            |          |          |         |         |        |         |         |
| P              | Heavy roughing    |         | PR      | RM        |         | NRF    |         | RX       | HZ         |          |          | PX      |         |        | PC8     |         |
|                |                   |         | QR      | QR        | MR, MP  | R5, R6 | NR6     | R3P      | RH         | HZ       | TRS, 57  | MP, HG  | HX      | GH     |         |         |
|                |                   |         | HR      | HR, 31    | RH      | R8, R7 | NRR     |          | HT, HD     | HCS, HX  | 65, TU   | HF, HU  |         | VT     |         | ER, HDR |
|                |                   |         | HH      |           |         | RR9    |         |          | HY, HZ     | HV, HDS  |          | HW      |         | VH     |         |         |
| M              | Finishing         | FS      | MF      | FP        | MF1     | NF4    | SF, F3M | EA, SF   | FS, LM     | SF       | SU       | MQ      | HA, VP2 | EF     | MB2     |         |
|                |                   |         | MS      | SM        | MS      | MF2    | MS3     | PP       | ML         | MS       | 28       | UP      | TK      | HA     |         |         |
| M              | Semi-finishing    | ES      | MM      | MP, UP    | MF4     | NMS    | M3M     | EM       | MS, GM     | SS, S    | EX, GU   | MS, MU  | GS, HS  | EM     | MC3     |         |
|                |                   |         | SC3     |           |         |        |         |          |            |          |          |         |         |        |         |         |
| K              | Medium processing | MG-     |         | RP        | M5      | NM5    | MG-     | MG-      | MG-, GK    | MG-      |          | C       |         | MG-    | PC4     |         |
|                |                   |         | RK5     |           |         |        |         |          |            |          |          |         |         |        |         |         |
| K              | Roughing          | Flatbed | KR      | UN        | MR7     | RK7    |         | RT       | GX, RK     | CH       | GZ       | ZS, GC  | GR      | DR     | KC4     |         |
|                |                   |         | KD5     |           |         |        |         |          |            |          |          |         |         |        |         |         |
| S              | Finishing         | FS      | SF      | FS        | MF1     | NF4    | SF      | EA, SF   | FS, LS     | TF       | SU       | MQ      | VP1     | EF     | SC1     |         |
|                |                   |         | MB2     |           |         |        |         |          |            |          |          |         |         |        |         |         |
| S              | Semi-finishing    | MS      |         | MS        | MF2     | MS3    | PP      | ML       | MS         | 28       | UP       | TK      | HA      |        | SL3     |         |
|                |                   |         | ES      | SM, SMC   | UP      | MR3    | NMS     | TF       | MP, SU     | MS       | HMM      | EG, EX  | MS, MU  | VP3    |         | NM      |
| S              | Medium processing |         |         |           |         |        |         |          |            |          |          |         |         |        | SC3     |         |
|                |                   |         |         |           |         |        |         |          |            |          |          |         |         |        |         |         |

The brand information of each manufacturer comes from public information. The data is for reference only and subject to the actual product information.

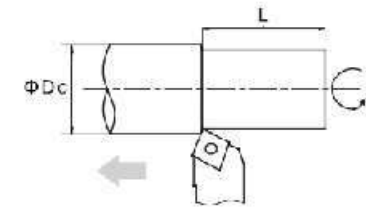
### Turning Chip breaker Comparison Table

| Classification | Application       | WORLDIA | SANDVIK          | KENAMETAL    | SECO | WALTER          | ISCAR             | TAEGUTEC | DURACARB | TUNGALOY      | KYOCERA          | MTSUSHI          | SUMITOMO        | KORLOY        | ZCC.CT   | Achteck |
|----------------|-------------------|---------|------------------|--------------|------|-----------------|-------------------|----------|----------|---------------|------------------|------------------|-----------------|---------------|----------|---------|
| P<br>M<br>K    | Finishing         | LU      | PF,UF            | UF, 11<br>GM | FF1  | PF4<br>PF5      | 38, PF            | FA,FX    |          | 01, PF<br>PSF | XP, GK<br>GP, VF | FV               | LU, FP          | VL, VF<br>HFP | SF, HF   | PB1     |
|                | Semi-finishing    |         | PM               | MP           |      |                 |                   | PC<br>FM | 41       | PSS<br>PS     | HQ               |                  |                 |               | EF<br>EM | PC2     |
|                | Medium processing |         | XM, PR<br>UR, XR | MF           | F2   | PM5<br>E47, MT- | 14, 17<br>19, MT- | MT       | 52       | PM            | MT-              | MQ, MV<br>MT-, G | SF, MU          | C25           | HR       | KC2     |
| N              | Semi-finishing    |         | AL               | HP           | AL   | PM2             | AF, AS            | FL       | AU       | AL            | AH               | AZ               | AW,AG<br>AK, AR | LH            | NC2      |         |

The brand information of each manufacturer comes from public information. The data is for reference only and subject to the actual product information.

### Turning General Formula

▶ Cutting speed



$$V_c = \frac{\pi * D_c * n}{1000} \text{ (m/min)}$$

V<sub>c</sub>: Cutting speed(m/min)    π=3.14  
D<sub>c</sub>: Workpiece diameter(mm)    n: Spindle speed(rev/min)

▶ Feed speed

$$V_f = f * n \text{ (mm/min)}$$

V<sub>f</sub>: Feed speed(mm/min)    f: Feed rate(mm/rev)  
n: Spindle speed(rev/min)

▶ Chip thickness

$$h = f * \sin \kappa_r \text{ (mm)}$$

h: Chip thickness(mm)    f: Feed rate(mm/rev)  
κ<sub>r</sub>: Tool cutting edge angle

▶ Chip width

$$b = \frac{a_p}{\sin \kappa_r} \text{ (mm)}$$

b: Chip width(mm)    a<sub>p</sub>: Axial depth of cut(mm)  
κ<sub>r</sub>: Tool cutting edge angle

▶ Chip area

$$A = h * b = a_p * f \text{ (mm}^2\text{)}$$

A: Chip area(mm<sup>2</sup>)    a<sub>p</sub>: Axial depth of cut(mm)  
f: Feed rate(mm/rev)

▶ Cutting force

$$F_c = K_c * a_p * f \text{ (N)}$$

F<sub>c</sub>: Cutting force(N)    K<sub>c</sub>: Unit cutting force(N/mm<sup>2</sup>)  
a<sub>p</sub>: Axial depth of cut(mm)    f: Feed rate(mm/rev)

▶ Cutting power

$$P_{mot} = \frac{K_c * V_c * a_p * f}{6000 * \eta} \text{ (KW)}$$

P<sub>mot</sub>: Cutting power(KW)    K<sub>c</sub>: Unit cutting force(N/mm<sup>2</sup>)  
V<sub>c</sub>: Cutting speed(m/min)    a<sub>p</sub>: Axial depth of cut(mm)  
f: Feed rate(mm/rev)    η: Mechanical efficiency

▶ Chip removal

$$Q = a_p * f * V_c \text{ (cm}^3\text{/min)}$$

Q: Chip removal(cm<sup>3</sup>/min)    a<sub>p</sub>: Axial depth of cut(mm)  
f: Feed rate(mm/rev)    V<sub>c</sub>: Cutting speed(m/min)

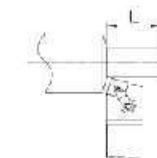
▶ Theoretic surface roughness



$$R_{max} = \frac{f^2}{8 * r} * 1000 \text{ (um)}$$

R<sub>max</sub>: Theoretic surface roughness(mm)  
f: Feed rate(mm/rev)    r: Corner radius(mm)





▶ Work time



$$T_c = \frac{L}{F * n} \text{ (min)}$$

T<sub>c</sub>: Work time    f: Feed rate(mm/rev)  
n: Spindle speed (rev/min)    L: Working length (mm)

Turning Insert Common Troubleshooting

| Failures            | Picture   | Analysis   | Solution  |
|---------------------|---|--|---|
| Flank wear          |    | <ul style="list-style-type: none"> <li>• Tool material is too soft</li> <li>• Excessive cutting speed</li> <li>• Too small clearance angle</li> <li>• Too low feed rate</li> <li>• Insufficient cooling</li> </ul> | <ul style="list-style-type: none"> <li>• Choose high wear-resistant insert grade</li> <li>• Reduce cutting speed</li> <li>• Enlarge clearance angle</li> <li>• Increase feed rate</li> </ul>  |
| Crater wear         |    | <ul style="list-style-type: none"> <li>• Tool material is too soft</li> <li>• Excessive cutting speed</li> <li>• Excessive feed rate</li> </ul>  | <ul style="list-style-type: none"> <li>• Choose high wear-resistant insert grade</li> <li>• Reduce cutting speed</li> <li>• Reduce feed rate</li> <li>• Increase the flow of coolant</li> </ul>   |
| Fracture            |    | <ul style="list-style-type: none"> <li>• Tool material is too hard</li> <li>• Too low cutting edge strength</li> </ul>   | <ul style="list-style-type: none"> <li>• Choose tougher grade</li> <li>• Enhance cutting edge strength</li> </ul>   |
| Plastic deformation |  | <ul style="list-style-type: none"> <li>• Tool material is too soft</li> <li>• Too fast cutting speed</li> <li>• Excessive cutting depth &amp; feed rate</li> <li>• Insufficient cooling</li> </ul>                 | <ul style="list-style-type: none"> <li>• Choose high wear-resistant insert grade</li> <li>• Reduce cutting speed</li> <li>• Reduce cutting depth &amp; feed rate</li> <li>• Choose good thermal conductivity grade</li> <li>• Increase the flow of coolant</li> </ul> |
| Built up edge       |  | <ul style="list-style-type: none"> <li>• Too low cutting speed</li> <li>• Cutting edge not sharp</li> <li>• Unsuitable grade</li> <li>• Insufficient cooling</li> </ul>  | <ul style="list-style-type: none"> <li>• Increase cutting speed</li> <li>• Choose sharp geometry</li> <li>• Choose less adhesion grade</li> <li>• Increase the flow of coolant</li> </ul>   |
| Mechanical wear     |  | <ul style="list-style-type: none"> <li>• Excessive feed rate and cutting depth</li> <li>• Vibration</li> </ul>   | <ul style="list-style-type: none"> <li>• Choose tougher grade</li> <li>• Choose a smaller approach angle</li> <li>• Choose bigger corner radius</li> <li>• Change to high rigidity holder</li> </ul>  |
| Cracks(thermal)     |  | <ul style="list-style-type: none"> <li>• Excessive cutting heat change on edge</li> </ul>  | <ul style="list-style-type: none"> <li>• Choose dry cutting oradequate cooling</li> <li>• Choose tougher grade</li> </ul>   |

Milling Grade Comparison Table

| Application | WORLDIA | SANDVIK | KENAMETAL | SECO    | WALTER  | ISCAR  | TAEGUTEC | MITSUBISHI | TUNGALOY | SUMITOMO | KYOCERA | KORLOY  | ZCC.CT  | Achteck |
|-------------|---------|---------|-----------|---------|---------|--------|----------|------------|----------|----------|---------|---------|---------|---------|
| P10         | WT3010* | GC1025* | KC715M*   |         | WXM15*  |        |          | F7010      |          | ACP100*  | PR1225* | PC3525* | YBG202* |         |
|             | WT3020* | GC1010* |           |         |         |        |          |            |          |          |         |         | YBG205* |         |
| P20         | WT5025* | GC1130* | KC522M*   | MP1500* | WKP25S  | IC330* | TT7080*  | MC7020     | T313W    | ACP200*  | PR1525* | PC3535* | YBC301  | AP251U* |
|             | WT5030* | GC1030* | KC525M*   | T250M   |         | IC250* | TT7030*  | MP6120*    | AH725*   | ACP2500* | PR1225* | PC3500* | YBC302  |         |
|             |         | GC4220  | KCPM20    | T25M    |         | IC950* |          | MV1020     |          |          | PR1230* |         | YBM251  |         |
|             |         | GC4020  |           | T20M    |         | IC520N |          | UP20M*     |          |          |         |         | YBG205* |         |
|             |         | GC4030  |           |         |         |        |          | F7030      |          |          |         |         | YBG252* |         |
| P30         | WT5025* | GC1130* | KC994M*   | MP2500  | WSM35S* | IC330* | TT9080*  | MP6130*    | T3130    | AC230*   | PR1230* | PC5300* | YBM351  | AP351U* |
|             | WT5030* | GC4040  | KC725M*   | T250M   | WKP35S  | IC328* | TT9030*  | VP15TF*    | GH330    | ACP300*  | PR1535* | PC9530* | YBM251  | AP351M* |
|             |         | GC4230  | KC792M*   | T25M    | WKP35G  | IC830* | TT7080*  | VP30RT*    | AH120*   |          |         | PC3600* | YBM301  | AC301P  |
|             |         | GC4330  | KC530M    | F25M    |         | IC908* |          | F7030      | AH330*   |          |         |         | YBG302* |         |
|             |         |         |           | F30M    |         |        |          |            | AH730*   |          |         |         |         |         |
| P40         | WT5035* | GC4040  | KC735M*   | MP300   | WKP45S  | IC635  | TT9030*  | VP30RT*    | AH140*   | AC230*   |         | PC9530* | YBC302  | AP403M* |
|             |         | GC4240  |           | T350M   | WSP46*  | IC928* |          |            |          | ACZ330*  |         |         | YBG302* |         |
|             |         | GC4340  |           | T60M    |         | IC4050 |          |            |          | ACZ350*  |         |         | YBG351* |         |
|             |         |         |           | T25M    |         |        |          |            |          |          |         |         |         |         |
| M10         |         | GC1025* | KC522M*   |         |         |        | TT9300*  | F7010      | T6120    | ACM100*  | PR1225* | NC5330  | YBG202* |         |
|             |         | GC1030* |           |         |         |        |          |            | T6020    | ACM200*  |         |         |         |         |
| M20         |         |         | KC730M*   | MS2050  | WXM15*  | IC380* | TT9300*  | MC7020     | T6130    | ACM200*  | PR1525* | PC5300* | YBM251  | AP251U* |
|             |         |         | KC525M*   | MP2500  |         | IC908* |          | VP15TF*    |          | ACP200*  | PR1225* | PC3545* | YBM253  |         |
|             |         |         |           | T250M   |         | IC928* |          | VP20RT*    |          | ACU2500* |         | PC9530* | YBC302  |         |
|             |         |         |           | T25M    |         |        |          | MP7030*    |          |          |         |         | YBG205* |         |
|             |         |         |           | F20M    |         |        |          | MP7130*    |          |          |         |         | YBG252* |         |
| M30         | WT5035* | GC1040* | KC994M*   | T350M   | WSM35S* | IC380* | T9080*   | F7030      |          | ACM300*  | CA6535  | PC3545* | YBC302  | AP351U* |
|             | WT3330* | GC2040* | KC725M*   | T250M   | WSM36*  | IC328* | TT8020*  | VP30RT*    |          | ACP300*  | PR1535* | PC5300* | YBG351* | AP351M* |
|             |         | S40T    | KCPK30*   | F40M    |         | IC330* |          | MP7140*    |          | ACZ350*  |         |         | YBG302* |         |
| M40         |         |         |           | MM4500  | WKP45S  | IC830* | TT8080*  | VP30RT*    |          | ACZ350*  |         | PC9530* | YBG302* | AP403M* |
|             |         |         |           |         | WSP46*  |        | TT8020*  | TT9300*    |          |          |         |         |         |         |
| K10         |         |         |           | MH1000  |         | IC5100 |          |            | T505     | ACK100*  |         | PC215K  |         |         |
|             |         |         |           |         |         | IC4100 |          |            | T5105    |          |         |         |         |         |
| K10         | WT7020* | GC1010* | KCK15*    | MK1500  | WXM15*  | IC5100 | K10      | MP8010*    | T515     | ACK200*  | PR1500* | PC6510* | YBD152  |         |
|             | WT4020  | GC3220  | KC915M*   | T150M   | WAK15   | IC4010 |          | MC5020     | T5115    | AC211*   | PR1210* | PC5300* | YBG102* |         |
|             |         | K15W    |           | F15M    | WSN10   | IC910* |          | MV1020     | T5125    |          | PR905*  |         | YBG252* |         |
|             |         |         |           |         |         | IC810* |          | VP10RT*    |          |          |         |         |         |         |
| K20         | WT7020* | GC1020* | KCC520M*  | MP1500* | WKP25S  | IC810* | TT6080*  | VP15TF*    | AH120*   | EH20Z*   | CA420M  |         | YBD152  | AP251K* |
|             | WT4020  | GC3020  | KC920M*   | MK2000* | WKK25S* | IC910* | TT7515   | VP20RT*    | AH725*   | ACZ310*  | PR1210* |         | YBD252  | AP351K* |
|             |         | GC3330  | KC925M*   | MK2050* |         | IC928* |          |            | T1215    | ACK300*  | CA415D  |         | YBG152* | AC301K  |
|             |         | GC3334  |           |         |         |        |          |            |          |          | PR905*  |         |         |         |
| K30         |         | GC3040  | KC930M*   | MK3000  | WKP35S  | IC928* | TT7515   |            | GH130*   |          |         |         | YBD252  |         |
|             |         | GC4040  |           | T250M   |         |        |          |            |          |          |         |         | YBG152* |         |
| S10         |         | GC1030* | KC510M*   | MS2050* |         | IC903* | K10      | MP9120*    |          | ACM100*  | CA6535  |         | YBG202* |         |
|             |         | GC1025* |           |         |         | IC807* |          | VP15TF*    |          | ACM200*  | PR1535* |         | YBS203* |         |
|             |         | GC1010* |           |         |         | IC808* |          |            |          |          | PR1210* |         |         |         |
|             |         |         |           |         |         | IC908* |          |            |          |          |         |         |         |         |
| S20         | WT5025* | GC1030* | KC525M*   | MP2050* | WSM35S* | IC903* | TT9080*  | MP9120*    |          | ACU2500* | CA6535  |         | YBS203* |         |
|             | WT5030* | GC2030* |           |         | WSM36*  | IC807* | TT9030*  | VP15TF*    |          | ACM200*  | PR1535* |         | YBS303* |         |
|             | WT3330* | GC1130* |           |         |         | IC808* | TT5525*  | MP9130*    |          |          | PR1210* |         |         |         |
|             |         |         |           |         |         | IC908* |          | MP9030*    |          |          |         |         |         |         |
|             |         |         |           |         |         | IC830* |          |            |          |          |         |         |         |         |
| S30         | WT5035* | GC2040* | KC725M*   | F40M*   | WSP45S* | IC328  | TT8080*  | MP9140*    |          | ACM300*  | PR1535* |         | YBS303* | AP403S* |
|             | WT3330* | S40T    | KCPM40*   |         | WSP46*  | IC330  | TT8020*  |            |          |          |         |         |         |         |
|             |         |         |           |         | WSM42X* |        | TT9300*  |            |          |          |         |         |         |         |
|             |         |         |           |         | WMP45G  |        |          |            |          |          |         |         |         |         |

\*\*Indicates the grade of PVD coating. The brand information of each manufacturer comes from public information. The data is for reference only and subject to the actual product information.

### Milling General Formula

▶ Cutting speed

$$V_c = \frac{\pi \cdot D_c \cdot n}{1000} \text{ (m/min)}$$

Vc: Cutting speed(m/min)  $\pi \approx 3.14$   
Dc: Cutter diameter(mm) n: Spindle speed(rev/min)

▶ Spindle speed

$$n = \frac{1000 \cdot V_c}{\pi \cdot D_c} \text{ (rev/min)}$$

Vc: Cutting speed(m/min)  $\pi \approx 3.14$   
Dc: Cutter diameter(mm) n: Spindle speed(rev/min)

▶ Feed speed

$$V_f = f_z \cdot n \cdot Z \text{ (mm/min)}$$

Vf: Feed speed(mm/min) fz: Feed rate per rev.(mm/z)  
n: Spindle speed(rev/min) Z: Number of teeth

▶ Feed rate per rev.

$$f_z = \frac{V_f}{n \cdot Z} \text{ (mm/z)}$$

fz: Feed rate per rev.(mm/z) Vf: Feed speed(mm/min)  
n: Spindle speed(rev/min) Z: Number of teeth

▶ Feed rate per teeth

$$f = \frac{V_f}{n} \text{ (mm/rev)}$$

f: Feed rate per rev.(mm/rev) Vf: Feed speed(mm/min)  
n: Spindle speed (rev/min)

▶ Work time

$$T_c = \frac{L}{V_f} \text{ (min)}$$

Tc: Work time(min) L: Length of feed(mm)  
Vf: Feed speed(mm/min)

▶ Horse power

$$H_p = \frac{P_{mot}}{0.75}$$

▶ Power demand

$$P_{mot} = \frac{a_p \cdot a_e \cdot V_f \cdot K_c}{6 \cdot 10^7 \cdot \eta} \text{ (KW)}$$

Pmot: Cutting power(KW) ap: Chip depth ae: Cutting width  
Kc: Unit cutting force(N/mm<sup>2</sup>)  
η: Machine efficiency coefficient(0.7-0.95)

▶ Average chip thickness

$$h_m = \frac{114.7 \cdot f_z \cdot \sin(\psi_s) \cdot (a_e / D_c)}{\psi_s} \text{ (KW)}$$

hm: Average chip thickness fz: Feed rate per rev.(mm/z)  
ae: Cutting width Dc: Cutter diameter(mm)  
ψs: Pressure angle

▶ Feed force

Cutter in the center site

$$\psi_s = 2 \cdot \arcsin\left(\frac{a_e}{D_c}\right) [^\circ]$$

Cutter in excentric site

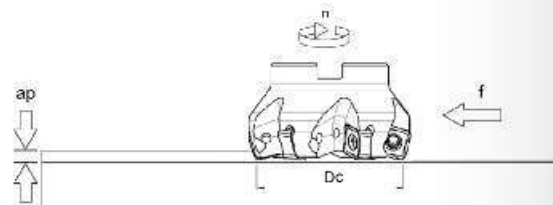
$$\psi_s = 90^\circ + \arcsin\left(\frac{a_e - (D_c/2)}{(D_c/2)}\right) [^\circ]$$

ψs: Pressure angle ae: Cutting width  
Dc: Cutter diameter(mm)

▶ Chip removal

$$Q = \frac{114.7 \cdot f_z \cdot \sin(\psi_s) \cdot (a_e / D_c)}{\psi_s} \text{ (KW)}$$

Q: Chip removal (cm<sup>3</sup>/min) ap: Chip depth  
ae: Cutting width Dc: Cutter diameter(mm)  
fz: Feed rate per rev.(mm/z) ψs: Pressure angle



### Drilling General Formula

▶ Cutting speed

$$V_c = \frac{\pi \cdot D_c \cdot n}{1000} \text{ (m/min)}$$

Vc: Cutting speed(m/min)  $\pi \approx 3.14$   
Dc: Drill diameter(mm) n: Spindle speed(rev/min)

▶ Spindle speed

$$n = \frac{1000 \cdot V_c}{\pi \cdot D_c} \text{ (rev/min)}$$

Vc: Cutting speed(m/min)  $\pi \approx 3.14$   
Dc: Drill diameter(mm) n: Spindle speed(rev/min)

▶ Feed speed

$$V_f = f_z \cdot n \cdot Z \text{ (mm/min)}$$

Vf: Feed speed(mm/min) fz: Feed rate per rev.(mm/z)  
n: Spindle speed(rev/min) Z: Number of teeth

▶ Feed rate per rev.

$$f_z = \frac{V_f}{n \cdot Z} \text{ (mm/z)}$$

fz: Feed rate per rev.(mm/z) Vf: Feed speed(mm/min)  
n: Spindle speed(rev/min) Z: Number of teeth

▶ Chip removal

$$Q = \frac{V_f \cdot \pi \cdot D_c^2}{4 \cdot 1000} \text{ (cm}^3\text{/min)}$$

Q: Chip removal(cm<sup>3</sup>/min) Vf: Feed speed(mm/min)  
 $\pi \approx 3.14$  Dc: Drill diameter(mm)

▶ Horse power

$$H_p = \frac{P_{mot}}{0.75}$$

Hp: Horse power Pmot: Cutting power(KW)

▶ Power demand

$$P_{mot} = \frac{Q \cdot K_c}{60000 \cdot \eta} \text{ (KW)}$$

Pmot: Cutting power(KW) Q: Chip removal(cm<sup>3</sup>/min)  
Kc: Unit cutting force(N/mm<sup>2</sup>)  
η: Machine efficiency coefficient(0.7-0.95)

▶ Torque

$$M_c = \frac{D_c^2 \cdot K_c \cdot f}{8000} \text{ (N} \cdot \text{m)}$$

Mc: Torque Dc: Drill diameter(mm)  
Kc: Unit cutting force(N/mm<sup>2</sup>) f: Feed rate per rev.(mm/rev)

▶ Feed force

$$F_f = 0.63 \cdot \frac{f \cdot D_c \cdot K_c}{2} \text{ (N)}$$

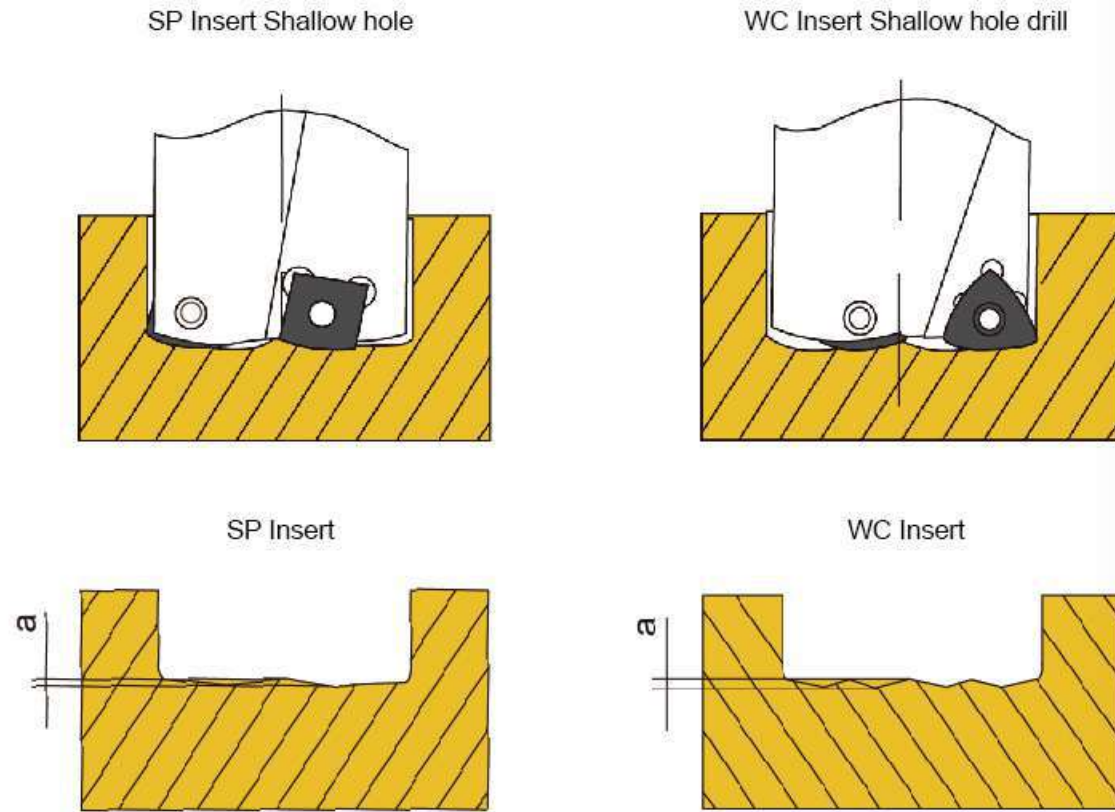
Ff: Feed force f: Feed rate per rev.(mm/rev)  
Dc: Drill diameter(mm) Kc: Unit cutting force(N/mm<sup>2</sup>)

▶ Chip thickness

$$h = f_z \cdot \sin(\psi_s) \text{ (mm)}$$

h: Chip thickness(mm) fz: Feed rate(mm/rev)

Shallow hole drilling machining blind hole size description



| Insert Type | Waveform Height a(mm) |
|-------------|-----------------------|
| SPMG 050204 | 0.30                  |
| SPMG 060204 | 0.40                  |
| SPMG 07T308 | 0.50                  |
| SPMG 090408 | 0.70                  |
| SPMG 110408 | 0.80                  |
| SPMG 140512 | 0.90                  |

| Insert Type | Waveform Height a(mm) |
|-------------|-----------------------|
| WCMT 030208 | 0.50                  |
| WCMT 040208 | 0.60                  |
| WCMT 050308 | 0.80                  |
| WCMT 06T308 | 0.95                  |
| WCMT 080412 | 1.25                  |

Hardness Conversion Table

| Hardness |      |         |         | Tensile Strength N/mm <sup>2</sup> |
|----------|------|---------|---------|------------------------------------|
| Rockwell |      | Vickers | Brinell |                                    |
| HRC      | HRA  | HV      | HB      |                                    |
| 70       | 86.6 | 1037    | -       | -                                  |
| 69.5     | 86.3 | 1017    | -       | -                                  |
| 69       | 86.1 | 997     | -       | -                                  |
| 68.5     | 85.8 | 978     | -       | -                                  |
| 68       | 85.5 | 959     | -       | -                                  |
| 67.5     | 85.2 | 941     | -       | -                                  |
| 67       | 85   | 923     | -       | -                                  |
| 66.5     | 84.7 | 906     | -       | -                                  |
| 66       | 84.4 | 889     | -       | -                                  |
| 65.5     | 84.1 | 872     | -       | -                                  |
| 65       | 83.9 | 856     | -       | -                                  |
| 64.5     | 83.6 | 840     | -       | -                                  |
| 64       | 83.3 | 825     | -       | -                                  |
| 63.5     | 83.1 | 810     | -       | -                                  |
| 63       | 82.8 | 795     | -       | -                                  |
| 62.5     | 82.5 | 780     | -       | -                                  |
| 62       | 82.2 | 766     | -       | -                                  |
| 61.5     | 82   | 752     | -       | -                                  |
| 61.0     | 81.7 | 739     | -       | -                                  |
| 60.5     | 81.4 | 726     | -       | -                                  |
| 60       | 81.2 | 713     | -       | 2555                               |
| 59.5     | 80.9 | 700     | -       | 2500                               |
| 59       | 80.6 | 688     | -       | 2450                               |
| 58.5     | 80.3 | 676     | -       | 2395                               |
| 58       | 80.1 | 664     | -       | 2345                               |
| 57.5     | 79.8 | 653     | -       | 2295                               |
| 57       | 79.5 | 642     | -       | 2250                               |
| 56.5     | 79.3 | 631     | -       | 2205                               |
| 56       | 79   | 620     | -       | 2160                               |
| 55.5     | 78.7 | 609     | -       | 2115                               |
| 55       | 78.5 | 599     | -       | 2075                               |
| 54.5     | 78.2 | 589     | -       | 2035                               |
| 54       | 77.9 | 579     | -       | 1995                               |
| 53.5     | 77.7 | 570     | -       | 1955                               |
| 53       | 77.4 | 561     | -       | 1920                               |
| 52.5     | 77.1 | 551     | -       | 1885                               |
| 52       | 76.9 | 543     | -       | 1850                               |
| 51.5     | 76.6 | 534     | -       | 1815                               |
| 51       | 76.3 | 525     | 501     | 1780                               |
| 50.5     | 76.1 | 517     | 494     | 1750                               |
| 50       | 75.8 | 509     | 488     | 1720                               |
| 49.5     | 75.5 | 501     | 481     | 1690                               |
| 49       | 75.3 | 493     | 474     | 1660                               |
| 48.5     | 75   | 485     | 468     | 1630                               |
| 48       | 74.7 | 478     | 461     | 1605                               |
| 47.5     | 74.5 | 470     | 455     | 1575                               |
| 47       | 74.2 | 463     | 449     | 1550                               |
| 46.5     | 73.9 | 456     | 442     | 1525                               |
| 46       | 73.7 | 449     | 436     | 1500                               |
| 45.5     | 73.4 | 443     | 430     | 1475                               |
| 45       | 73.2 | 436     | 424     | 1450                               |
| 44.5     | 72.9 | 429     | 418     | 1430                               |
| 44       | 72.6 | 423     | 413     | 1405                               |
| 43.5     | 72.4 | 417     | 407     | 1385                               |
| 43       | 72.1 | 411     | 401     | 1360                               |

| Hardness |      |         |         | Tensile Strength N/mm <sup>2</sup> |
|----------|------|---------|---------|------------------------------------|
| Rockwell |      | Vickers | Brinell |                                    |
| HRC      | HRA  | HV      | HB      |                                    |
| 42.5     | 71.8 | 405     | 396     | 1340                               |
| 42       | 71.6 | 399     | 391     | 1320                               |
| 41.5     | 71.3 | 393     | 385     | 1300                               |
| 41       | 71.1 | 388     | 380     | 1280                               |
| 40.5     | 70.8 | 382     | 375     | 1260                               |
| 40       | 70.5 | 377     | 370     | 1245                               |
| 39.5     | 70.3 | 372     | 365     | 1225                               |
| 39       | 70   | 367     | 360     | 1210                               |
| 38.5     | -    | 362     | 355     | 1190                               |
| 38       | -    | 357     | 350     | 1175                               |
| 37.5     | -    | 352     | 345     | 1160                               |
| 37       | -    | 347     | 341     | 1140                               |
| 36.5     | -    | 342     | 336     | 1125                               |
| 36       | -    | 338     | 332     | 1110                               |
| 35.5     | -    | 333     | 327     | 1095                               |
| 35       | -    | 329     | 323     | 1080                               |
| 34.5     | -    | 324     | 318     | 1065                               |
| 34       | -    | 320     | 314     | 1050                               |
| 33.5     | -    | 316     | 310     | 1035                               |
| 33       | -    | 312     | 306     | 1020                               |
| 32.5     | -    | 308     | 302     | 1010                               |
| 32       | -    | 304     | 298     | 995                                |
| 31.5     | -    | 300     | 294     | 980                                |
| 31       | -    | 296     | 291     | 970                                |
| 30.5     | -    | 292     | 287     | 960                                |
| 30       | -    | 289     | 283     | 950                                |
| 29.5     | -    | 285     | 280     | 935                                |
| 29       | -    | 281     | 276     | 920                                |
| 28.5     | -    | 278     | 273     | 910                                |
| 28       | -    | 274     | 269     | 900                                |
| 27.5     | -    | 271     | 266     | 890                                |
| 27       | -    | 268     | 263     | 880                                |
| 26.5     | -    | 264     | 260     | 870                                |
| 26       | -    | 261     | 257     | 860                                |
| 25.5     | -    | 258     | 254     | 850                                |
| 25       | -    | 255     | 251     | 835                                |
| 24.5     | -    | 252     | 248     | 830                                |
| 24       | -    | 249     | 245     | 820                                |
| 23.5     | -    | 246     | 242     | 810                                |
| 23       | -    | 243     | 240     | 800                                |
| 22.5     | -    | 240     | 237     | 790                                |
| 22       | -    | 237     | 234     | 785                                |
| 21.5     | -    | 234     | 232     | 775                                |
| 21       | -    | 231     | 229     | 765                                |
| 20.5     | -    | 229     | 227     | 760                                |
| 20       | -    | 226     | 225     | 750                                |
| 19.5     | -    | 223     | 222     | 745                                |
| 19       | -    | 221     | 220     | 735                                |
| 18.5     | -    | 218     | 218     | 730                                |
| 18       | -    | 216     | 216     | 725                                |
| 17.5     | -    | 214     | 214     | 715                                |
| 17       | -    | 211     | 211     | 710                                |

The hardness standard information is derived from public information. The data is for reference only and subject to the actual product information.



Material Conversion Table

| ISO              | China | U.S.A         | Germany |           | U.K.             |      | Sweden | France  | Italy         | Spain     | Japan       |
|------------------|-------|---------------|---------|-----------|------------------|------|--------|---------|---------------|-----------|-------------|
|                  | GB    | AISI/SAE      | W.-nr   | DIN       | BS               | EN   | SS     | AFNOR   | UNI           | UNE       | JIS         |
| Structural steel |       |               |         |           |                  |      |        |         |               |           |             |
| 15               |       | 1015          | 1.0401  | C15       | 080M15           | -    | 1350   | CC12    | C15C16        | F.111     | -           |
| 20               |       | 1020          | 1.0402  | C22       | 050A20           | 2C   | 1450   | CC20    | C20C21        | F.112     | -           |
| 35               |       | 1035          | 1.0501  | C35       | 080A35           | -    | 1550   | CC35    | C35           | F.113     | -           |
| 45               |       | 1045          | 1.0503  | C45       | 080M40           | -    | 1650   | CC45    | C45           | F.114     | -           |
| 55               |       | 1055          | 1.0535  | C55       | 070M55           | -    | 1655   | -       | C55           | -         | -           |
| 60               |       | 1060          | 1.0601  | C60       | 080A62           | 43D  | -      | CC55    | C60           | -         | -           |
| Y15              |       | 1213          | 1.7015  | 9SMn28    | 230M07           | -    | 1912   | S250    | CF9SMn28      | 11SMn28   | SUM22       |
| -                |       | 12L13         | 1.0718  | 9SMnPb28  | -                | -    | 1914   | S250Pb  | CF9MnPb28     | 11SMnPb28 | SUM22L      |
| -                |       | -             | 1.0722  | 10SPb20   | -                | -    | -      | 10PbF2  | CF10Pb20      | 10SPb20   | -           |
| -                |       | 1140          | 1.0726  | 35S20     | 212M36           | 8M   | 1957   | 35MF4   | -             | F210G     | -           |
| Y13              |       | 1215          | 1.0736  | 9SMn36    | 240M07           | 1B   | -      | S300    | CF9SMn36      | 12SMn35   | -           |
| -                |       | 12L14         | 1.0737  | 9SMnPb36  | -                | -    | 1926   | S300Pb  | CF9SMnPb36    | 12SMnP35  | -           |
| 55Si2Mn          |       | 9255          | 1.0904  | 55Si9     | 250A53           | 45   | 2085   | 55S7    | 55Si8         | 56Si7     | -           |
| -                |       | 9262          | 1.0961  | 60SiCr7   | -                | -    | -      | 60SiCr7 | 60SiCr8       | 60SiCr8   | -           |
| 15               |       | 1015          | 1.1141  | Ck15      | 080M15           | 32C  | 1370   | XC12    | C16           | C15K      | S15C        |
| 40Mn             |       | 1039          | 1.1157  | 40Mn4     | 150M36           | 15   | -      | 35M5    | -             | -         | -           |
| 25               |       | 1025          | 1.1158  | Ck25      | -                | -    | -      | -       | -             | -         | S25C        |
| 35Mn2            |       | 1335          | 1.1167  | 36Mn5     | -                | -    | 2120   | 40Mn5   | -             | 36Mn5     | SMn438(H)   |
| 30Mn             |       | 1330          | 1.117   | 28Mn6     | 150M28           | 14A  | -      | 20M5    | C28Mn         | -         | SCMn1       |
| 35Mn             |       | 1035          | 1.1183  | Cr35      | 080A35           | -    | 1572   | XS38TS  | C36           | -         | S35C        |
| Ck45             |       | 1045          | 1.1191  | 45        | 080M46           | -    | 1672   | XC42    | C45           | C45K      | S45C        |
| 55               |       | 1055          | 1.1203  | Ck55      | 070M55           | -    | -      | XC45    | C50           | C55K      | S55C        |
| 60               |       | 1060          | 1.1213  | Cr63      | 080A52           | -    | 1674   | XC48TS  | C53           | -         | S50C        |
| 60Mn             |       | 1060          | 1.1221  | Ck60      | 080A62           | 43D  | 1678   | XC60    | C60           | -         | S58C        |
| -                |       | 1095          | 1.1274  | Ck101     | 080A96           | -    | 1870   | -       | -             | -         | SUP4        |
| -                |       | -             | 1.3401  | X120Mn12  | Z120M12          | -    | -      | X120M12 | XG120Mn12     | X120Mn12  | SCMnH/1     |
| Gr15.45Gr        |       | 52100         | 1.3505  | 100Cr6    | 534A99           | 31   | 2258   | 100C6   | 100Cr6        | F.131     | SUJ2        |
| -                |       | ASTM A204Gr.A | 1.5415  | 15Mo3     | 1501-240         | -    | 2912   | 15D3    | 16Mo3KW       | 16Mo3     | -           |
| -                |       | 4520          | 1.5426  | 16Mo5     | 1503-245-420     | -    | -      | -       | 16Mo5         | 16Mo5     | -           |
| -                |       | ASTMA350LF5   | 1.5622  | 14Ni6     | -                | -    | -      | 16N6    | 14Ni6         | 15Ni6     | -           |
| -                |       | ASTM A353     | 1.5662  | X8Ni9     | 1501-509;510     | -    | -      | -       | X10Ni9        | XBNi9     | -           |
| -                |       | 2515          | 1.5680  | 12Ni19    | -                | -    | -      | Z18N5   | -             | -         | -           |
| -                |       | 3135          | 1.5710  | 36NiCr6   | 640A35           | 111A | -      | 35NC6   | -             | -         | SNC236      |
| -                |       | 3415          | 1.5732  | 14NiCr10  | -                | -    | -      | 14NC11  | 16NiCr11      | 15NiCr11  | SNC415(H)   |
| -                |       | 3415 3310     | 1.5752  | 14NiCr14  | 655M13<br>655A12 | 36A  | -      | 12NC15  | -             | -         | SNC815(H)   |
| -                |       | 9840          | 1.6511  | 38CrNiMo4 | 816M40           | 110  | -      | 40NCD3  | 38CrNiMo4(KB) | 35CrNiMo4 | -           |
| -                |       | 8620          | 1.6523  | 21NiCrMo2 | 850M20           | 362  | 2503   | 20NCD2  | 20NiCrMo2     | 20NiCrMo2 | SNCCM220(H) |
| -                |       | 8740          | 1.6546  | 40NiCrMo2 | 311-Type7        | -    | -      | -       | 40NiCrMo2(KB) | 40NiCrMo2 | SNC240      |

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Material Conversion Table

| ISO              | China | U.S.A             | Germany |                          | U.K.              |     | Sweden | France             | Italy                        | Spain           | Japan              |
|------------------|-------|-------------------|---------|--------------------------|-------------------|-----|--------|--------------------|------------------------------|-----------------|--------------------|
|                  | GB    | AISI/SAE          | W.-nr   | DIN                      | BS                | EN  | SS     | AFNOR              | UNI                          | UNE             | JIS                |
| Structural steel |       |                   |         |                          |                   |     |        |                    |                              |                 |                    |
| 40CrNiMoA        |       | 4340              | 1.6582  | 34CrNiMo6                | 817M40            | 24  | 2541   | 35NCD6             | 35CrNiMo6 (KB)               | -               | -                  |
| -                |       | -                 | 1.6587  | 17CrNiMo6                | 820A16            | -   | -      | 18NCD6             | -                            | 14CrNiMo13      | -                  |
| 15Cr             |       | 5015              | 1.7015  | 15Cr3                    | 523M15            | -   | -      | 12C3               | -                            | -               | SCr415(H)          |
| 35Cr             |       | 5132              | 1.7033  | 34Cr4                    | 530A32            | 18B | -      | 32C4               | 34Cr4(KB)                    | 35Cr4           | SCr430(H)          |
| 40Cr             |       | 5140              | 1.7035  | 41Cr4                    | 530M40            | 18  | -      | 42C4               | 41Cr4                        | 42Cr4           | SCr440(H)          |
| 40Cr             |       | 5140              | 1.7045  | 42Cr4                    | -                 | -   | 2245   | -                  | -                            | 42Cr4           | SCr440             |
| 18CrMn           |       | 5115              | 1.7131  | 16MnCr15                 | (527M20)          | -   | 2511   | 16MC5              | 16MnCr15                     | 16MnCr15        | -                  |
| 20CrMn           |       | 5155              | 1.7176  | 55Cr3                    | 527A80            | 48  | -      | 55C3               | -                            | -               | SUP9(A)            |
| 30CrMn           |       | 4130              | 1.7218  | 25CrMo4                  | 1717CDS110        | -   | 2225   | 25CD4              | 25CrMo4(KB)                  | 55Cr3           | SCM420<br>SCM430   |
| 35CrMo           |       | 4137;4135         | 1.722   | 34CrMo4                  | 708A37            | 19B | 2234   | 35CD4              | 35CrMo4                      | 34CrMo4         | SCM432<br>SCRRM3   |
| 40CrMoA          |       | 4140;4142         | 1.7223  | 41CrMo4                  | 709M40            | 19A | 2244   | 42CD4TS            | 41CrMo4                      | 41CrMo4         | SCM440             |
| 42CrMo           |       | 4140              | 1.7225  | 42CrMo4                  | 708M40            | 19A | 2244   | 42CD4              | 42CrMo4                      | 42CrMo4         | SCM440(H)          |
| 42CrMnMo         |       | -                 | 1.7262  | 15CrMo5                  | -                 | -   | 2216   | 12CD4              | -                            | 12CrMo4         | SCM415(H)          |
| -                |       | ASTM A182 F11;F12 | 1.7335  | 13CrMo44                 | 1501-620 Gr.27    | -   | -      | 15CD3.5<br>15CD4.5 | 14CrMo44                     | 14CrMo45        | -                  |
| -                |       | -                 | 1.7361  | 32CrMo12                 | 722M24            | 40B | 2240   | 30CD12             | 32CrMo12                     | F.124.A         | -                  |
| -                |       | ASTM A182 F.22    | 1.738   | 10CrMo910                | 1501-622 Gr.31;45 | -   | 2218   | 12CD9;10           | 12CrMo9,10                   | TU.H            | -                  |
| -                |       | -                 | 1.7715  | 14MoV63                  | 1503-680-440      | -   | -      | -                  | -                            | 13MoCrV6        | -                  |
| 50CrVA           |       | 6150              | 1.8159  | 50CrV4                   | 735A50            | 47  | 2230   | 50CV4              | 50CrV4                       | 51CrV4          | -                  |
| -                |       | -                 | 1.8509  | 41CrAlMo7                | 905M39            | 41B | 2940   | 40CAD6,12          | 41CrAlMo7                    | 41CrAlMo7       | SUP10              |
| -                |       | -                 | 1.8523  | 39CrMoV139               | 897M39            | 40C | -      | -                  | 36CrMoV12                    | -               | -                  |
| Tool steel       |       |                   |         |                          |                   |     |        |                    |                              |                 |                    |
| T10              |       | W.110             | 1.1545  | C105W1                   | -                 | -   | 1880   | Y1105              | C98KU<br>C100KU              | F.515 F.516     | -                  |
| T12A             |       | W.112             | 1.1663  | C125W                    | -                 | -   | -      | Y2120              | C120KU                       | (C120)          | SK2                |
| CrV;9SiCr        |       | L3                | 1.2067  | 100Cr6                   | BL3               | -   | -      | Y100C6             | -                            | 100Cr6          | -                  |
| Cr12             |       | D3                | 1.208   | X210Cr12                 | BD3               | -   | -      | Z200Cr12           | X210Cr13KU<br>X250Cr12KU     | X210Cr12        | SKD1               |
| 4Cr5MoVSi        |       | H13               | 1.2344  | X40<br>CrMoV51           | BH13              | -   | 2242   | Z40CDV5            | X35CrMoV08KU<br>X40CrMoV51KU | X40CrMoV5       | SKD61              |
| Cr6WV            |       | A2                | 1.2363  | X100<br>CrMoV51          | BA2               | -   | 2260   | Z100CDV5           | X100<br>CrMoV51KU            | X100CrMoV5      | SKD12              |
| CrWMo            |       | -                 | 1.2419  | 105WCr6                  | -                 | -   | 2140   | 105WC13            | 10WCr6<br>107WCr5KU          | 1.05WCr5        | SKS31<br>SKS2 SKS3 |
| Cr12W            |       | -                 | 1.2436  | X210CrW12                | -                 | -   | 2312   | -                  | X215CrW12<br>1KU             | X210CrW12       | SKD2               |
| 5CrNiMo          |       | S1                | 1.2542  | 45WCrV7                  | BS1               | -   | 2710   | -                  | 45WCrV8KU                    | 45WCrSi8        | -                  |
| 3Cr2W8V          |       | H21               | 1.2581  | X30WCrV93<br>X30WCrV93KU | BH21              | -   | -      | Z30WCV9            | X28W9KU<br>X30WCrV9 3KU      | X30WCrV9        | SKD5               |
| Cr12MoV          |       | -                 | 1.2601  | X165CrMoV<br>12          | -                 | -   | 2310   | -                  | X165<br>CrMoV12KU            | X160<br>CrMoV12 | SKD11              |
| 5CrNiMo          |       | L6                | 1.2713  | 55NiCrMoV8               | -                 | -   | -      | 55NCDV7            | -                            | F.250.S         | SKT4               |

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Material Conversion Table

| ISO | China             | U.S.A    | Germany |           | U.K. |    | Sweden | France                 | Italy            | Spain      | Japan |       |
|-----|-------------------|----------|---------|-----------|------|----|--------|------------------------|------------------|------------|-------|-------|
|     | GB                | AISI/SAE | W.-nr   | DIN       | BS   | EN | SS     | AFNOR                  | UNI              | UNE        | JIS   |       |
| P   | Tool steel        |          |         |           |      |    |        |                        |                  |            |       |       |
|     | V                 | W210     | 1.2833  | 100V1     | BW2  | -  | -      | Y1105V                 | -                | -          | -     | SKS43 |
|     | W9Mo5<br>Cr4V2Co5 | -        | 1.3243  | S6-5-2-5  | -    | -  | 2723   | Z85WDCV                | HS6-5-2-5        | HS6-5-2-5  | -     | SKH55 |
|     | W1<br>8Cr4VCo5    | T4       | 1.3255  | S18-1-2-5 | BT4  | -  | -      | Z80WKC<br>10-05-04-01  | X78WCo<br>1805KU | HS18-1-1-5 | -     | SKH3  |
|     | W9Mo5<br>Cr4V2    | M2       | 1.3343  | S6-5-2    | BM2  | -  | 2722   | Z85WDCV<br>06-05-04-02 | X82WMo<br>0805KU | HS6-5-2    | -     | SKH9  |
|     | -                 | M7       | 1.3348  | S2-9-2    | -    | Z  | 2782   | Z100WCWV<br>9-02-04-02 | HS2-9-2          | HS2-9-2    | -     | -     |
|     | W18Cr4V           | T1       | 1.3355  | S18-0-1   | BT1  | -  | -      | Z80WCV<br>18-04-01     | X75W18KU         | HS1 8-0-1  | -     | SKH2  |
|     | W9Mo5<br>Cr4V3    | M3       | -       | S6-5-3    | -    | -  | -      | -                      | -                | -          | -     | SKH52 |
|     | -                 | M42      | -       | -         | BM42 | -  | -      | -                      | -                | -          | -     | SKH59 |
|     | -                 | -        | -       | -         | -    | -  | -      | -                      | -                | -          | -     | -     |

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| ISO                | China                  | U.S.A      | Germany | Japan         | DAIDO (Japan)   | Main application  |
|--------------------|------------------------|------------|---------|---------------|---|---|
|                    | GB                     | AISI/SAE   | DIN     | JIS           | DAIDO   |   |
| P                  | Plastic die steel      |            |         |               |   |   |
|                    | -                      | P20 mod.   | -       | -             | PX5N  | Large mirror mold for mass production. Car taillights, mirror shell front baffles, cameras, household appliances, etc |
|                    | -                      | -          | -       | -             | NAK55   | High precision mirror mold. Video camera, music, makeup container, transparent mask, transparent film, etc            |
|                    | -                      | -          | -       | -             | NAK80   | High mirror high precision mold. Camera, makeup container, transparent mask, transparent film, etc                    |
|                    | 3Cr13                  | 420 mod.   | -       | SUS420J2 mod. | S-STAR  | Ultra mirror corrosion resistant precision mold. Camera parts, compact discs, lenses, watch cases                     |
|                    | Cold working die steel |            |         |               |   |   |
|                    | -                      | 2          | -       | SKS93         | YK30  | Stamping die, gauge, paper cutter, auxiliary tool   |
|                    | 9CrWMn                 | D1 mod.    | -       | SKS3 mod.     | GOA   | Blanking die, gauge, drawing die, tap, punch  |
|                    | Cr12MoV                | D2         | -       | SKD11         | DC11  | Blanking die, cold working forming die, cold drawing die, forming roll, punch   |
|                    | -                      | D2 mod.    | -       | SKD11 mod.    | DC53  | Blanking die, cold working forming die, cold drawing die, forming roll, punch   |
| Hot work die steel |                        |            |         |               |   |   |
| 4Cr5MoSiV1         | H13                    | X40CrMoV51 | SKD61   | DHA1          | Aluminum die casting die, die casting die related parts, hot stamping die, hot extrusion die, hot shear blade |   |
| -                  | -                      | -          | -       | DH21          | Long life aluminum die casting mold   |   |
| -                  | -                      | -          | -       | DH31-S        | Large die casting mold  |   |
| -                  | -                      | -          | -       | DH2F          | Die casting mold, plastic mold  |   |

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Material Conversion Table

| ISO               | China                      | U.S.A    | Germany              |                    | U.K.       |         | Sweden           | France             | Italy       | Spain                    | Japan                   |        |
|-------------------|----------------------------|----------|----------------------|--------------------|------------|---------|------------------|--------------------|-------------|--------------------------|-------------------------|--------|
|                   | GB                         | AISI/SAE | W.-nr                | DIN                | BS         | EN      | SS               | AFNOR              | UNI         | UNE                      | JIS                     |        |
| M                 | Structural steel           |          |                      |                    |            |         |                  |                    |             |                          |                         |        |
|                   | 0Cr13<br>1Cr12             | 403      | 1.4                  | X8Cr13             | 403S17     | -       | 2301             | Z6C13              | X8Cr13      | F.3110                   | SUS403                  |        |
|                   | -                          | -        | 1.4001               | X7Cr14             | -          | -       | -                | -                  | -           | -                        | F.8401                  | -      |
|                   | 1Cr13                      | 410      | 1.4006               | X10Cr13            | 410S21     | 56A     | 2302             | Z10C14             | X12Cr13     | F.3401                   | SUS410                  |        |
|                   | 1Cr17                      | 430      | 1.4016               | X8Cr17             | 430S15     | 60      | 220              | Z8C17              | X8Cr17      | F.3113                   | SUS430                  |        |
|                   | 2Cr13                      | 410      | 1.4021               | X20Cr13            | S62        | 56B;56C | -                | Z20C13             | X20C13      | F.3401                   | SUS410                  |        |
|                   | -                          | -        | 1.4027               | G-X20Cr14          | 420C29     | 56B     | -                | Z20C13M            | -           | -                        | -                       | SCS2   |
|                   | 4Cr13                      | -        | 1.4034               | X48Cr13            | 420S45     | 56D     | 2304             | Z40C<br>Z38C13M    | X40Cr14     | F.3405                   | SUS420J2                |        |
|                   | 1Cr17Ni2                   | 431      | 1.4057               | X20CrNi172         | 431S29     | 57      | 2321             | Z15CNI6.02         | X16CrNi16   | F.3427                   | SUS431                  |        |
|                   | Y1Cr17                     | 430F     | 1.4104               | X12CrMoS17         | -          | -       | 2383             | Z10CF17            | X10CrS17    | F.3117                   | SUS430F                 |        |
|                   | 1Cr17Mo                    | 434      | 1.4113               | X8CrMo171          | 434S17     | -       | 2325             | Z8CD17.01          | X8CrMo17    | -                        | SUS434                  |        |
|                   | -                          | -        | 1.4313               | X5CrNi134          | 425C11     | -       | -                | Z4CND<br>13.4M     | -           | -                        | -                       | SCS5   |
|                   | -                          | -        | 1.4408               | G-X6Cr<br>NiMo1810 | 316C16     | -       | -                | -                  | -           | -                        | F.8414                  | SCS14  |
|                   | 4Cr9Si2                    | HW3      | 1.4718               | X45CrSi93          | 401S45     | 52      | -                | Z45CS9             | X45CrSi8    | F.322                    | SUH1                    |        |
|                   | 0Cr13Al                    | 405      | 1.4724               | X10CrAl13          | 403S17     | -       | -                | Z10C13             | X10CrAl12   | F.311                    | SUS405                  |        |
|                   | Cr17                       | 430      | 1.4742               | X10CrAl18          | 430S15     | 60      | -                | Z10CAS18           | X8Cr17      | F.3113                   | SUS430                  |        |
|                   | 8Cr20Si2Ni                 | HNV6     | 1.4757               | X80CrNiSi20        | 443S65     | 59      | -                | Z80<br>CSN20.02    | X80CrSiNi20 | F.320V                   | SUH4                    |        |
|                   | 2Cr25N                     | 446      | 1.4762               | X10CrAl24          | -          | -       | 2322             | Z10CAS24           | X16Cr26     | -                        | -                       | SUH446 |
|                   | Austenitic stainless steel |          |                      |                    |            |         |                  |                    |             |                          |                         |        |
|                   | 0Cr18Ni9                   | 304      | 1.4301               | X5CrNi1810         | 304S15     | 58E     | 2332             | Z8CN18.09          | X5CrNi1810  | F.3551;<br>F.3541;F.3504 | -                       | SUS304 |
| 1Cr18Ni9<br>MoZr  | 303                        | 1.4305   | X10CrNiS189          | 303S21             | 58M        | 2346    | Z10CNF18.09      | X10CrNiS18.09      | F.3508      | -                        | SUS303                  |        |
| 0Cr19Ni10         | 304L                       | 1.4306   | X2CrNi1911           | 304S12             | -          | 2352    | Z2CN18.10        | X2CrNi18.11        | F.3503      | -                        | SCS19                   |        |
| -                 | -                          | 1.4308   | G-X6CrNi189          | 304C15             | -          | -       | Z6CN18.10M       | -                  | -           | -                        | SCS13                   |        |
| Cr17Ni7           | 301                        | 1.4310   | X12CrNi177           | -                  | -          | 2331    | Z12CN17.07       | X12CrNi1707        | F.3517      | -                        | SUS301                  |        |
| -                 | 304LN                      | 1.4311   | X2CrNiN1810          | 304S62             | -          | 2371    | Z2CN18.10        | -                  | -           | -                        | SUS304LN                |        |
| 0Cr19Ni9          | 304                        | 1.435    | X5CrNi189            | 304S31             | 58E        | -       | Z8CN18.09        | X5CrNi1810         | -           | -                        | SUS304                  |        |
| 0Cr17Ni11<br>Mo2  | 316                        | 1.4401   | X5CrNiMo1712         | 316S16             | Z6CND17.11 | 2347    | 1.4401           | X5CrNiMo<br>1712   | F.3543      | -                        | SUS316                  |        |
| 00Cr17Ni13<br>Mo2 | 316LN                      | 1.4429   | X2CrNiMoN<br>17133   | -                  | -          | 2375    | Z2CND17.13       | -                  | -           | -                        | SUS316LN                |        |
| 00Cr27Ni12<br>Mo3 | 316L                       | 1.4435   | X2CrNiMo<br>18143    | 316S12             | -          | 2353    | Z2CDN17.13       | X2CrNiMo<br>1713   | -           | -                        | SCS16,                  |        |
| 00Cr19Ni13<br>Mo3 | 317L                       | 1.4438   | X2CrNiMo<br>17133    | 317S12             | -          | 2367    | Z2CND19.15       | X2CrNiMo<br>18.16  | -           | -                        | SUS317L                 |        |
| -                 | 329L                       | 1.4460   | X8CrNiMo275          | -                  | -          | 2324    | -                | -                  | -           | -                        | SUS329L;<br>SCH11;SCS11 |        |
| 1Cr18Ni9Ti        | 321                        | 1.4541   | X8CrNiTi1810         | 2337               | 321S12     | 58B     | Z8CNT18.10       | X8CrNiTi1811       | F.3553      | -                        | SUS321                  |        |
| 1Cr18Ni11Nb       | 347                        | 1.455    | X8CrNiNb1810         | 347S17             | 58F        | 2338    | Z8CNNb18.1       | X8CrNiTi1811       | F.3552      | -                        | SUS347                  |        |
| Cr18Ni12<br>Mo2Ti | 316Ti                      | 1.4571   | X6CrNiMoTi<br>17122  | 320S17             | 58J        | 2350    | Z8NDT17.12       | X8CrNiMoTi17       | F.3535      | -                        | -                       |        |
| -                 | -                          | 1.4581   | G-X5CrNi<br>MoNb1810 | 318C7              | -          | -       | Z4CNDNb<br>1812M | XG8CrNiMo18        | -           | -                        | SCS22                   |        |
| Cr17Ni12<br>Mo3Nb | 318                        | 1.4583   | X10CrNi<br>MoNb1812  | -                  | -          | -       | Z6CNDNb<br>1713B | X8CrNiMo<br>TiNb17 | -           | -                        | -                       |        |
| 1Cr23Ni13         | 309                        | 1.4828   | X15CrNiSi2012        | 309S24             | -          | -       | Z15CNS20.1       | -                  | -           | -                        | SUH309                  |        |
| 0Cr25Ni20         | 310S                       | 1.4845   | X12CrNi2521          | 310S24             | -          | 2361    | Z12CN2520        | X8CrNi2520         | F.331       | -                        | SUH310                  |        |
| Cr15Ni38W3Ti      | 330                        | 1.4864   | X12NiCrSi3616        | -                  | -          | -       | Z12CNS35.1       | -                  | -           | -                        | SUH330                  |        |
| -                 | -                          | 1.4865   | G-X40NiCrSi<br>3818  | 330C11             | -          | -       | -                | XG50NiCr3919       | -           | -                        | SCH15                   |        |
| 5Cr2Mn9Ni4N       | EV8                        | 1.4871   | X53CrMn<br>NiN219    | 349S54<br>321S12   | 58B        | -       | Z52CMN21.0       | X53CrMnNiN<br>219  | -           | -                        | SUH35                   |        |
| 1Cr18Ni9Ti        | 321                        | 1.4878   | X12CrNiTi189         | 321S320            | 58C        | -       | Z8CNT18.12       | X8CrNiTi1811       | F.3523      | -                        | SU321                   |        |

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Material Conversion Table

| ISO | China            | U.S.A    | Germany |                  | U.K.             | S      | weden | France        | Italy           | Spain      | Japan |                        |
|-----|------------------|----------|---------|------------------|------------------|--------|-------|---------------|-----------------|------------|-------|------------------------|
|     | GB               | AISI/SAE | W.-nr   | DIN              | BS               | EN     | SS    | AFNOR         | UNI             | UNE        | JIS   |                        |
| M   | Structural steel |          |         |                  |                  |        |       |               |                 |            |       |                        |
|     | 0Cr27Ni12Mo3     | 316L     | 1.4435  | X2CrNiMo 18143   | 316S12           | -      | 2353  | Z2CDN17.13    | X2CrNiMo1713    | -          | -     | SCS16,                 |
|     | 00Cr19Ni13Mo3    | 317L     | 1.4438  | X2CrNiMo 17133   | 317S12           | -      | 2367  | Z2CND19.15    | X2CrNiMo18.16   | -          | -     | SUS317L                |
|     | -                | 329L     | 1.4460  | X8CrNiMo275      | -                | -      | 2324  | -             | -               | -          | -     | SUS329L<br>SCH11;SCS11 |
|     | 1Cr18Ni9Ti       | 321      | 1.4541  | X8CrNiTi1810     | 2337             | 321S12 | 58B   | Z8CNT18.10    | X8CrNiTi1811    | F.3553     | -     | SUS321                 |
|     | 1Cr18Ni11Nb      | 347      | 1.455   | X8CrNiNb1810     | 347S17           | 58F    | 2338  | Z8CNNb18.1    | X8CrNiTi1811    | F.3552     | -     | SUS347                 |
|     | Cr18Ni12Mo2Ti    | 316Ti    | 1.4571  | X8CrNiMoTi 7122  | 320S17           | 58J    | 2350  | Z8NDT17.12    | X8CrNiMoTi17    | F.3535     | -     | -                      |
|     | -                | -        | 1.4581  | G-X5CrNiMoNb1810 | 318C7            | -      | -     | Z4CNDNb 1812M | XG8CrNiMo18     | -          | -     | SCS22                  |
|     | Cr17Ni12Mo3Nb    | 318      | 1.4583  | X10CrNiMoNb1812  | -                | -      | -     | Z6CNDNb 1713B | X8CrNiMo TiNb17 | -          | -     | -                      |
|     | 1Cr23Ni13        | 309      | 1.4828  | X15CrNiSi2012    | 309S24           | -      | -     | Z15CNS20.1    | -               | -          | -     | SUH309                 |
|     | 0Cr25Ni20        | 310S     | 1.4845  | X12CrNi2521      | 310S24           | -      | -     | 2381          | Z12CN2520       | X8CrNi2520 | F.331 | SUH310                 |
|     | Cr16Ni30W3Ti     | 330      | 1.4864  | X12NiCrSi3616    | -                | -      | -     | Z12CNS35.1    | -               | -          | -     | SUH330                 |
|     | -                | -        | 1.4865  | G-X40NiCrSi 3818 | 330C11           | -      | -     | -             | XG50NiCr3919    | -          | -     | SCH15                  |
|     | 5Cr2Mn9Ni4N      | EV8      | 1.4871  | X53CrMnNiN 219   | 349S54<br>321S12 | 58B    | -     | Z52CMN21.0    | X53CrMn NiN219  | -          | -     | SUH35                  |
|     | 1Cr18Ni9Ti       | 321      | 1.4878  | X12CrNiTi189     | 321S320          | 58C    | -     | Z8CNT18.12    | X8CrNiTi1811    | F.3523     | -     | SU321                  |

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| ISO   | China             | U.S.A      | Germany | U.K.   | Sweden   | France    | Italy    | Spain    | Japan  |
|-------|-------------------|------------|---------|--------|----------|-----------|----------|----------|--------|
|       | GB                | AISI/SAE   | W.-nr   | EN     | SS       | AFNOR     | UNI      | UNE      | JIS    |
| K     | Nodular cast iron |            |         |        |          |           |          |          |        |
|       | QT400-18          | 60-40-18   | GGG40   | 400/17 | 071 7-02 | FGS370-17 | GS370-17 | FGE38-17 | FCD400 |
|       | QT450-10          | 65-45-12   | -       | 420/12 | -        | FGS400-12 | GS400-12 | FGE42-12 | FCD450 |
|       | QT500-7           | 70-50-05   | GGG50   | 500/7  | 0727-02  | FGS500-7  | GS500-7  | FGE50-7  | FCD500 |
|       | QT600-3           | 80-80-03   | GGG80   | 600/7  | 0732-03  | FGS600-2  | GS600-2  | FGE60-2  | FCD600 |
|       | QT700-2           | 100- 70-03 | GGG70   | 700/2  | 0737-01  | FGS700-2  | GS700-2  | FGE70-2  | FCD700 |
|       | QT800-2           | 120-90-02  | GGG80   | 800/2  | 0864-03  | FGS800-2  | GS800-2  | FGE80-2  | FCD800 |
|       | QT900-2           | -          | -       | 900/2  | -        | -         | -        | -        | -      |
|       | Grey cast iron    |            |         |        |          |           |          |          |        |
|       | -                 | NO.80      | GG40    | -      | 0140     | FGL 400   | -        | -        | -      |
|       | HT350             | NO.50      | GG35    | 350    | 0135     | FGL 350   | G35      | FG35     | FC350  |
|       | HT300             | NO.45      | GG30    | 300    | 0130     | FGL 300   | G30      | FG30     | FC300  |
|       | HT250             | NO.35      | GG25    | 250    | 0125     | FGL 250   | G25      | FG25     | FC250  |
|       | HT200             | NO.30      | GG20    | 200    | 0120     | FGL 200   | G20      | FG20     | FC200  |
|       | HT150             | NO.20      | GG15    | 150    | 0115     | FGL 150   | G15      | FG15     | FC150  |
| HT100 | -                 | -          | 100     | 0110   | -        | G10       | -        | FC100    |        |

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