

# HOW TO READ THE STANDARD OF ROTATING TOOL INSERTS

## ● How the section of rotating tool inserts is organized

- ① Organized according to cutter type.
- ② Cutters are arranged in alphabetical order.

## ● How the standards for rotating tool inserts are organized

- ① Classified into rotating tool inserts, wiper inserts and drilling inserts.
- ② Arranged in order of alphabet of order number.

**PAGE TITLE**  
**PRODUCT SECTION**

**ROTATING TOOL INSERTS**

**CLASSIFICATION**

| Order Number      | (ISO) Number      | Cutter Type | Page | Order Number    | (ISO) Number    | Cutter Type | Page |
|-------------------|-------------------|-------------|------|-----------------|-----------------|-------------|------|
| AEMW15034ER       | AEMW15034ER       | BAE500      |      | APMT113SPDER-M0 | APMT113SPDER-M0 | BAP300      |      |
| AEMW15030ER       | AEMW15030ER       |             | K030 | APMT113SPDER-M1 | APMT113SPDER-M1 |             | K031 |
|                   |                   |             |      | APMT113SPDER-M2 | APMT113SPDER-M2 |             |      |
| AEMW197304ER      | AEMW197304ER      | BAE600      |      | APGT1604PDR-G2  | APGT1604PDR-G2  | BAP400      |      |
| AEMW19730ER       | AEMW19730ER       |             | K031 |                 |                 |             | K031 |
|                   |                   |             |      |                 |                 |             |      |
| AOGT123602PEFR-GM | AOGT123602PEFR-GM | APX3000     |      | APMT1604PDER-H1 | APMT1604PDER-H1 |             |      |
| AOGT123604PEFR-GM | AOGT123604PEFR-GM | CL096       | K026 | APMT1604PDER-H2 | APMT1604PDER-H2 |             | K031 |
| AOGT123608PEFR-GM | AOGT123608PEFR-GM |             |      | APMT1604PDER-H4 | APMT1604PDER-H4 |             |      |
|                   |                   |             |      | APMT1604PDER-H6 | APMT1604PDER-H6 |             |      |
| AOMT123604PEER-H  | AOMT123604PEER-H  |             | K026 | APMT1604PDER-M2 | APMT1604PDER-M2 |             | K031 |
| AOMT123608PEER-H  | AOMT123608PEER-H  |             |      |                 |                 |             |      |
| AOMT123616PEER-H  | AOMT123616PEER-H  |             |      |                 |                 |             |      |
| AOMT123602PEER-M  | AOMT123602PEER-M  |             |      |                 |                 |             |      |
| AOMT123604PEER-M  | AOMT123604PEER-M  |             |      |                 |                 |             |      |
| AOMT123608PEER-M  | AOMT123608PEER-M  |             |      |                 |                 |             |      |
| AOMT123610PEER-M  | AOMT123610PEER-M  |             |      |                 |                 |             |      |
| AOMT123612PEER-M  | AOMT123612PEER-M  |             | K026 |                 |                 |             | K035 |
| AOMT123616PEER-M  | AOMT123616PEER-M  |             |      |                 |                 |             |      |
| AOMT123620PEER-M  | AOMT123620PEER-M  |             |      |                 |                 |             |      |
| AOMT123624PEER-M  | AOMT123624PEER-M  |             |      |                 |                 |             |      |
| AOMT123630PEER-M  | AOMT123630PEER-M  |             |      |                 |                 |             |      |
| AOMT123632PEER-M  | AOMT123632PEER-M  |             |      |                 |                 |             |      |
| AOMT184804PEER-H  | AOMT184804PEER-H  | APX4000     |      | CPMT12052PEN-M2 | CPMT12052PEN-M2 | PWR         |      |
| AOMT184808PEER-H  | AOMT184808PEER-H  | CL110       | K026 | CPMT12052PEN-M3 | CPMT12052PEN-M3 | CL291       | K036 |
| AOMT184816PEER-H  | AOMT184816PEER-H  |             |      |                 |                 |             |      |
| AOMT184832PEER-H  | AOMT184832PEER-H  |             |      |                 |                 |             |      |
| AOMT184840PEER-H  | AOMT184840PEER-H  |             |      |                 |                 |             |      |
| AOMT184808PEER-M  | AOMT184808PEER-M  |             |      |                 |                 |             |      |
| AOMT184810PEER-M  | AOMT184810PEER-M  |             | K026 |                 |                 |             | K051 |
| AOMT184812PEER-M  | AOMT184812PEER-M  |             |      |                 |                 |             |      |
| AOMT184816PEER-M  | AOMT184816PEER-M  |             |      |                 |                 |             |      |
| AOMT184820PEER-M  | AOMT184820PEER-M  |             |      |                 |                 |             |      |
| APGT113SPDR-G2    | APGT113SPDR-G2    | BAP300      |      |                 |                 |             |      |
|                   |                   |             | K031 |                 |                 |             | K051 |
|                   |                   |             |      |                 |                 |             |      |
| APMT113SPDER-H1   | APMT113SPDER-H1   |             |      |                 |                 |             |      |
| APMT113SPDER-H2   | APMT113SPDER-H2   |             | K031 |                 |                 |             |      |
| APMT113SPDER-H6   | APMT113SPDER-H6   |             |      |                 |                 |             |      |

**K014**

**INSERT NUMBER**

**CUTTER TYPE**

**PHOTO OF INSERT**

**PAGE TO GO TO**

indicates the reference pages for detailed standards of specific inserts.

**GRADE APPLICATION RECOMMENDED FOR EACH WORK MATERIAL**  
cutting conditions suitable for each work materials are shown as a general guide to select grade.  
●:Stable Cutting ●:General Cutting ✖:Unstable Cutting

**PAGE TITLE BY TOOL APPLICATION**

**INSERT GRADE**  
**INSERT TOLERANCE • HONING**  
**INSERT NUMBER**

ROTATING TOOL INSERT

# ROTATING INSERTS

Work Material

|   |                      |
|---|----------------------|
| P | Steel                |
| M | Stainless Steel      |
| K | Cast Iron            |
| N | Non-Ferrous Metal    |
| H | Heat-resistant Alloy |
| S | Titanium Alloy       |
| W | Hardened Steel       |

|   |        |
|---|--------|
| B | Blue   |
| E | Grey   |
| G | Green  |
| R | Red    |
| Y | Yellow |
| W | White  |
| U | Black  |

Cutting Conditions (Guide)

- Stable Cutting
- Serviced Cutting
- ✖ Unstable Cutting
- Honing
- Bore

Cutter Type  
Insert Geometry

Order Number

(ISO) Number

Class

Grade

Dimensions (inch)

AHX440S **CL038**  
AHX440W **CL044**

NMMU13050ZER-L

NMMU13050ZER-L

M

●●●●●

528 227 039 031

NMMU13050ZER-M

NMMU13050ZER-M

M

●●●●●

528 219 039 031

NMMU13053ZEN-M

NMMU13053ZEN-M

M

●●●●●

528 219 — 126

NMMU13053ZEN-R

NMMU13053ZEN-R

M

●●●●●

528 219 — 126

AHX440S **CL038**

WNEU1305ZEN4C-M

WNEU1305ZEN4C-M

E

●●●●●

528 201 157 106

AHX640S **CL048**

NMMU20070ZEN-M

NMMU20070ZEN-M

M

●●●●●

787 315 039 031

AHX640S **CL048**

NMMU20070ZEN-MP

NMMU20070ZEN-MP

M

●●●●●

787 315 039 031

AHX640S **CL048**

NMMU200712ZER-MM

NMMU200712ZER-MM

M

●●●●●

787 315 039 047

AHX640S **CL048**  
AHX640W **CL060**

NMMU200608ZEN-HK

NMMU200608ZEN-HK

M

●●●●●

787 258 039 031

AHX640S **CL048**  
AHX640W **CL060**

NMMU200608ZEN-MK

NMMU200608ZEN-MK

M

●●●●●

787 258 039 031

ROTATING TOOL INSERTS

K

K024

●: USA Stock ●: Stocked in Japan  
✖: 10 inserts in one piece

**INSERT GEOMETRY**

**STOCK STATUS**

**INSERT DIMENSIONS**

**LEGEND FOR STOCK STATUS MARK**  
is shown on the left hand page of each double-page spread.

● To Order : Please specify insert number and grade.

## MILLING TOOLS

# INSERT STANDARDS

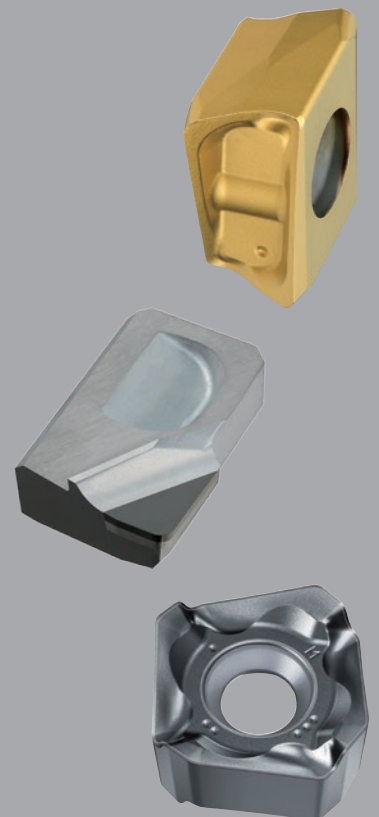
## CBN & PCD INSERT STANDARDS

## INSERT GRADES

|                                 |      |
|---------------------------------|------|
| IDENTIFICATION .....            | K002 |
| GRADES FOR MILLING .....        | K004 |
| MILLING APPLICATION RANGE ..... | K005 |
| COATED CARBIDE(CVD & PVD) ..... | K008 |
| CERMET .....                    | K010 |
| CEMENTED CARBIDE .....          | K011 |
| CBN(SINTERED CBN) .....         | K012 |
| PCD(SINTERED DIAMOND) .....     | K013 |
| CLASSIFICATION .....            | K014 |

### STANDARD ROTATING TOOL INSERTS

|                                    |      |
|------------------------------------|------|
| ROTATING INSERTS .....             | K024 |
| CBN & PCD INSERTS .....            | K050 |
| CBN & PCD INSERTS WITH WIPER ..... | K052 |
| DRILLING INSERTS .....             | K053 |



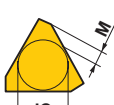
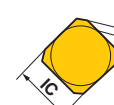
# IDENTIFICATION

■ ISO CODES FOR MILLING

| Symbol         | Insert Shape      |                                                                                   |
|----------------|-------------------|-----------------------------------------------------------------------------------|
| <b>S</b>       | Square            |  |
| <b>T</b>       | Triangular        |  |
| <b>C</b>       | Rhombic 80°       |  |
| <b>N</b>       | Regular Heptagon  |  |
| <b>O</b>       | Octagonal         |  |
| <b>M</b>       | Rhombic 86°       |  |
| <b>A</b>       | Parallelogram 85° |  |
| <b>R</b>       | Round             |  |
| <b>X</b>       | Special Design    | —                                                                                 |
| <b>W</b>       | Wiper             | —                                                                                 |
| ① Insert Shape |                   |                                                                                   |

| Symbol             | Relief Angle <b>AN</b> |                                                                                     |
|--------------------|------------------------|-------------------------------------------------------------------------------------|
| <b>C</b>           | 7°                     |  |
| <b>D</b>           | 15°                    |  |
| <b>E</b>           | 20°                    |  |
| <b>F</b>           | 25°                    |  |
| <b>G</b>           | 30°                    |  |
| <b>N</b>           | 0°                     |  |
| <b>P</b>           | 11°                    |  |
| <b>O</b>           | Other                  |                                                                                     |
| <b>X</b>           | Other                  |                                                                                     |
| Major Relief Angle |                        |                                                                                     |
| ② Relief Angle     |                        |                                                                                     |

|        |          |          |          |          |
|--------|----------|----------|----------|----------|
| INCH   | <b>S</b> | <b>E</b> | <b>E</b> | <b>R</b> |
| METRIC | <b>S</b> | <b>E</b> | <b>E</b> | <b>R</b> |

| ③ Tolerance Class |                                                                                     |                                                                                     |                                                                                     |       |
|-------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------|
|                   |  |  |  |       |
| Class             | IC                                                                                  |                                                                                     | M                                                                                   | S     |
| <b>A</b>          | .500                                                                                | ±.001                                                                               | ±.0002                                                                              | ±.001 |
| <b>C</b>          | .250<br>.375                                                                        | ±.001                                                                               | ±.0005                                                                              | ±.001 |
| <b>E</b>          | .500<br>.625                                                                        | ±.001                                                                               | ±.001                                                                               | ±.001 |
| <b>H</b>          | .394<br>.492                                                                        | ±.0005                                                                              | ±.0005                                                                              | ±.001 |
| <b>G</b>          | .551                                                                                | ±.001                                                                               | ±.001                                                                               | ±.005 |
| <b>K</b>          | .250                                                                                | ±.002                                                                               | ±.0005                                                                              | ±.001 |
|                   | .375                                                                                | ±.002                                                                               | ±.0005                                                                              | ±.001 |
|                   | .500                                                                                | ±.003                                                                               | ±.0005                                                                              | ±.001 |
|                   | .625                                                                                | ±.003                                                                               | ±.0005                                                                              | ±.001 |
| <b>N</b>          | .250                                                                                | ±.002                                                                               | ±.003                                                                               | ±.001 |
|                   | .375                                                                                | ±.002                                                                               | ±.003                                                                               | ±.001 |
|                   | .500                                                                                | ±.003                                                                               | ±.006                                                                               | ±.001 |
|                   | .625                                                                                | ±.004                                                                               | ±.006                                                                               | ±.001 |
| <b>M</b>          | .250                                                                                | ±.002                                                                               | ±.003                                                                               | ±.005 |
|                   | .375                                                                                | ±.002                                                                               | ±.003                                                                               | ±.005 |
|                   | .500                                                                                | ±.003                                                                               | ±.005                                                                               | ±.005 |
|                   | .625                                                                                | ±.004                                                                               | ±.006                                                                               | ±.005 |

| ④ Chip Breaker With or Without Hole |              |                                              |               |                                                                                       |
|-------------------------------------|--------------|----------------------------------------------|---------------|---------------------------------------------------------------------------------------|
| Metric                              |              |                                              |               |                                                                                       |
| Symbol                              | Hole         | Hole Configuration                           | Chip-breakers | Figure                                                                                |
| <b>W</b>                            | With Hole    | Cylindrical Hole + One Countersink (40°—60°) | No            |  |
| <b>T</b>                            | With Hole    | Cylindrical Hole + One Countersink (40°—60°) | Onesided      |  |
| <b>U</b>                            | With Hole    | Cylindrical Hole + Countersink (40°—60°)     | Double sided  |  |
| <b>B</b>                            | With Hole    | Cylindrical Hole + One Countersink (70°—90°) | No            |  |
| <b>N</b>                            | Without Hole | —                                            | No            |  |
| <b>R</b>                            | Without Hole | —                                            | Onesided      |  |
| <b>X</b>                            | —            | —                                            | —             | Special Design                                                                        |

Note 1) Dimension symbols conforming to ISO13399. See pages P002-P005 for details.

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ROTATING TOOL INSERTS

| Inch                                                                              |                                                                                   | Diameter of Inscribed Circle (inch) | Metric                                                                            |                                                                                   |                                                                                   |                                                                                   |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
|  |  |                                     |  |  |  |  |
|                                                                                   |                                                                                   | .250                                |                                                                                   | 06                                                                                | 06                                                                                | 11                                                                                |
|                                                                                   |                                                                                   | .313                                |                                                                                   | 08                                                                                | 07                                                                                | 13                                                                                |
| 3                                                                                 | 3                                                                                 | .375                                |                                                                                   | 09                                                                                | 09                                                                                | 16                                                                                |
|                                                                                   |                                                                                   | .394                                | 10                                                                                |                                                                                   |                                                                                   |                                                                                   |
|                                                                                   |                                                                                   | .472                                | 12                                                                                |                                                                                   |                                                                                   |                                                                                   |
| 4                                                                                 | 4                                                                                 | .500                                |                                                                                   | 12                                                                                | 12                                                                                | 22                                                                                |
| 5                                                                                 |                                                                                   | .625                                |                                                                                   | 16                                                                                | 15                                                                                | 27                                                                                |
|                                                                                   |                                                                                   | .787                                | 20                                                                                |                                                                                   |                                                                                   |                                                                                   |

⑤ Insert Size

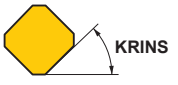
| Inch | Thickness (inch) | Metric |
|------|------------------|--------|
| 2.5  | .156             | T3     |
| 2    | .125             | 03     |
| 3    | .187             | 04     |

⑥ Insert Thickness

|   |                                                                                     |              |
|---|-------------------------------------------------------------------------------------|--------------|
| E |  | Round        |
| F |  | Sharp        |
| T |  | Chamfer      |
| S |  | Chamfer+Hone |
| Z |  | Chamfer      |

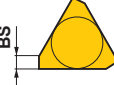
⑨ Cutting Edge Condition

⑤ 4 ⑥ 2 A F E R 1 - JS  
12 03 A F E R 1 - JS

| ⑦ Cutting Edge Angle                                                                |             |
|-------------------------------------------------------------------------------------|-------------|
|  |             |
| A                                                                                   | 45°         |
| E                                                                                   | 75°         |
| P                                                                                   | 90°         |
| Z                                                                                   | Other Angle |

| ⑧ Wiper Edge Relief Angle                                                           |     |
|-------------------------------------------------------------------------------------|-----|
|  |     |
| D                                                                                   | 15° |
| E                                                                                   | 20° |
| F                                                                                   | 25° |
| G                                                                                   | 30° |

| ⑩ Cutting Direction |         |
|---------------------|---------|
| L                   | Left    |
| N                   | Neutral |
| R                   | Right   |

| ⑪ Width of Wiper Edge                                                                |      |
|--------------------------------------------------------------------------------------|------|
|  |      |
| 1                                                                                    | .055 |
| 2                                                                                    | .094 |

| ⑫ Chip Breaker |            |
|----------------|------------|
| Symbol         | Name       |
| FT             | FT Breaker |
| HS             | HS Breaker |
| JH             | JH Breaker |
| JM             | JM Breaker |
| JP             | JP Breaker |
| JS             | JS Breaker |
| LS             | LS Breaker |
| MM             | MM Breaker |
| MS             | MS Breaker |

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ROTATING TOOL INSERTS

# GRADES FOR MILLING

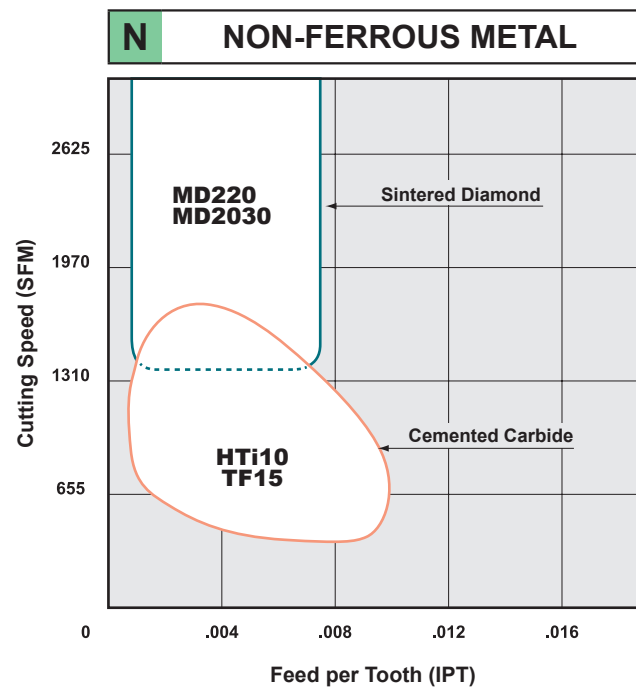
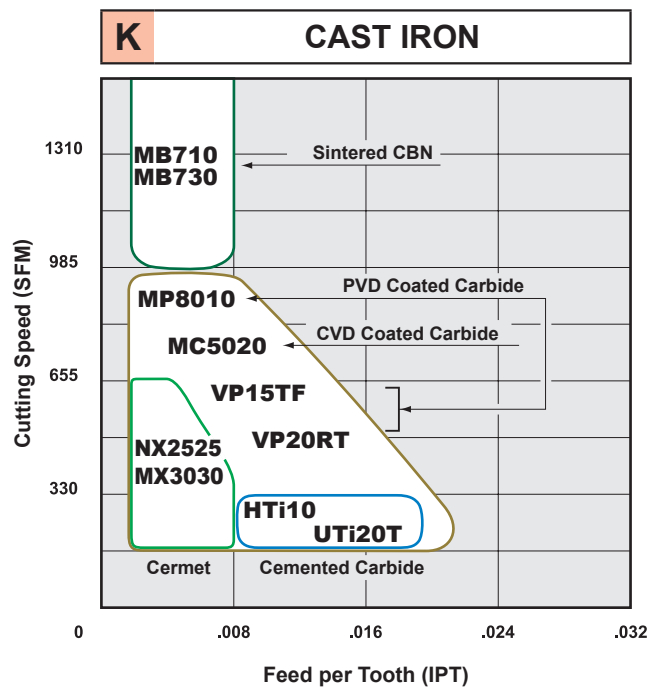
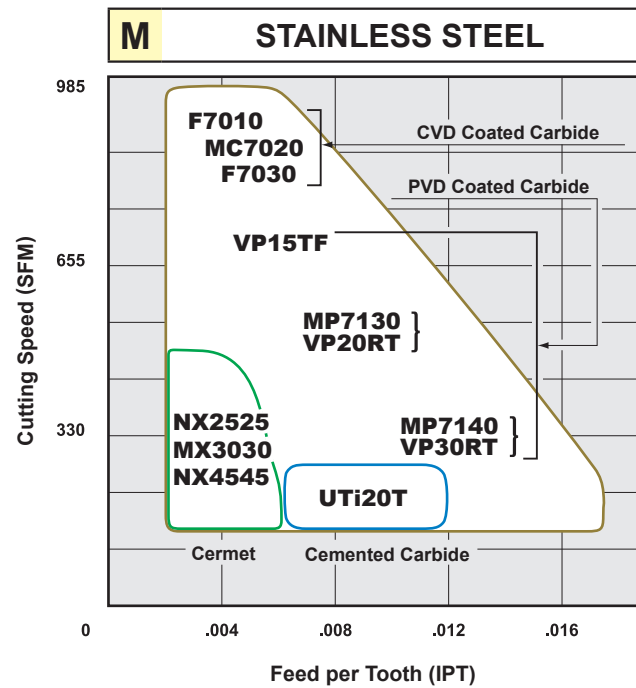
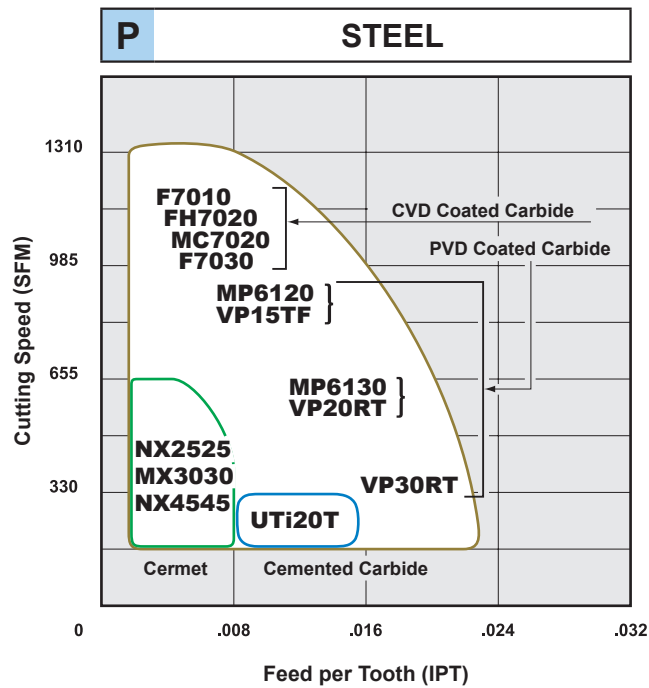
## ● INDEXABLE INSERT GRADES FOR MILLING

| ISO                                         | Coated Carbide |               | Coated Cermet | Cermet        | Cemented Carbide | CBN<br>(Sintered CBN) | PCD<br>(Sintered Diamond) |
|---------------------------------------------|----------------|---------------|---------------|---------------|------------------|-----------------------|---------------------------|
|                                             | CVD            | PVD           |               |               |                  |                       |                           |
| Steel<br><b>P</b>                           | 10             | F7010         |               |               |                  |                       |                           |
|                                             | 20             | MC7020        |               | NX2525        |                  |                       |                           |
|                                             | 30             | FH7020        |               | NEW<br>MX3020 |                  |                       |                           |
|                                             | 40             | F7030         |               | MX3030        | UTi20T           |                       |                           |
|                                             |                | MP6120        | VP25N         | NX4545        |                  |                       |                           |
| Stainless Steel<br><b>M</b>                 | 10             | F7010         |               |               |                  |                       |                           |
|                                             | 20             | MC7020        |               | NX2525        |                  |                       |                           |
|                                             | 30             | F7030         |               | NEW<br>MX3020 |                  |                       |                           |
|                                             | 40             | VP15TF        | VP25N         | MX3030        | UTi20T           |                       |                           |
|                                             |                | MP7130        |               | NX4545        |                  |                       |                           |
| Cast Iron<br><b>K</b>                       | 10             | MC5020        |               |               |                  |                       |                           |
|                                             | 20             |               |               | NX2525        | HTi05T           | MB710                 |                           |
|                                             | 30             | MP8010        | VP25N         | NEW<br>MX3020 | HTi10            | MB730                 |                           |
|                                             |                | VP15TF        |               | MX3030        | UTi20T           |                       |                           |
|                                             |                | VP20RT        |               |               |                  |                       |                           |
| Non-Ferrous Metal<br><b>N</b>               | 10             |               |               |               | HTi10            |                       | MD205                     |
|                                             | 20             |               |               |               |                  |                       | MD220                     |
|                                             | 30             | LC15TF        |               |               | TF15             |                       | MD230                     |
|                                             |                |               |               |               |                  |                       | MD2030                    |
|                                             |                |               |               |               |                  |                       |                           |
| Heat Resistant Alloy • Ti Alloy<br><b>S</b> | 10             |               |               |               |                  | MB730                 |                           |
|                                             | 20             | MP9120        |               |               |                  |                       |                           |
|                                             | 30             | VP15TF        |               |               |                  |                       |                           |
|                                             | 40             | MP9130        |               |               |                  |                       |                           |
|                                             |                | NEW<br>MP9140 |               |               |                  |                       |                           |
| Hardened Steel<br><b>H</b>                  | 10             | MP8010        |               |               |                  |                       |                           |
|                                             | 20             | VP15TF        |               |               |                  |                       |                           |
|                                             | 30             |               |               |               |                  |                       |                           |

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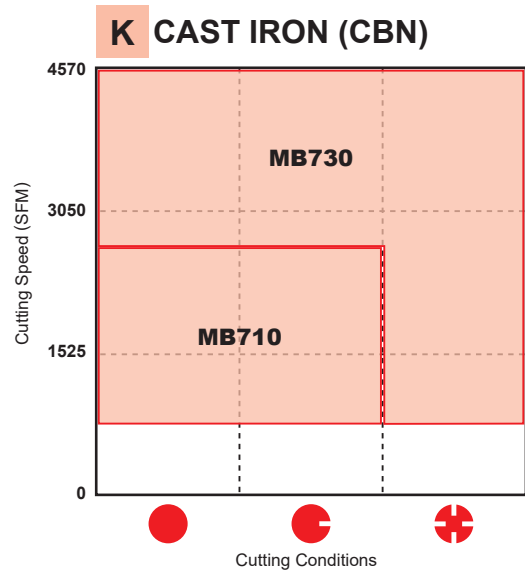
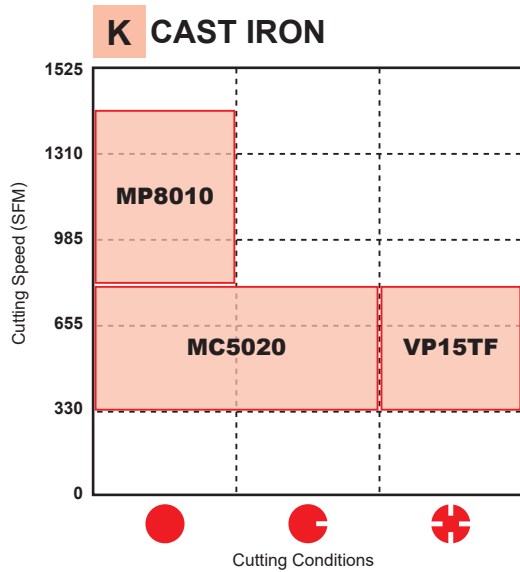
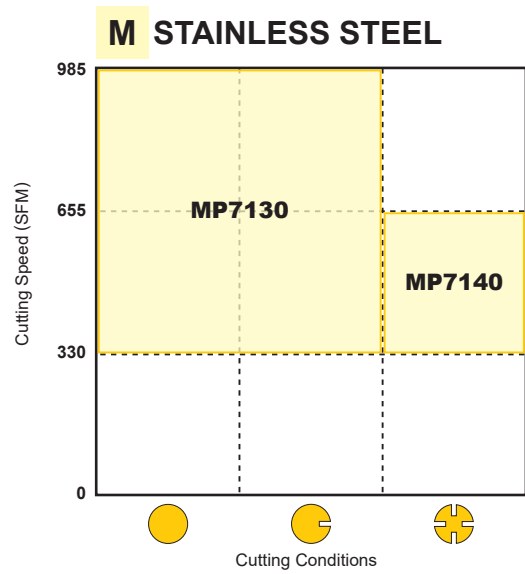
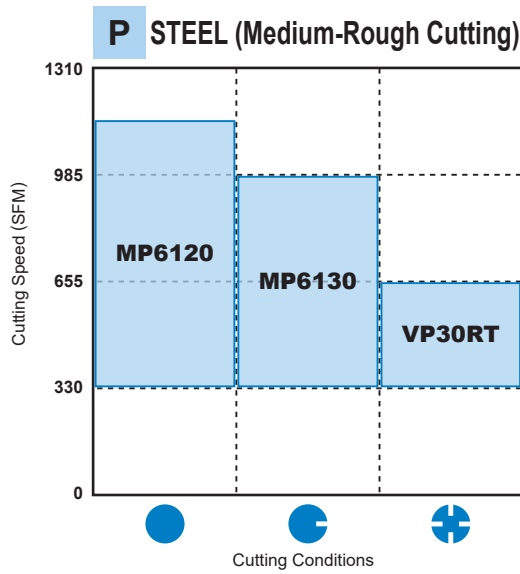
ROTATING TOOL INSERTS

# MILLING APPLICATION RANGE



# MILLING APPLICATION RANGE

● Recommendation of the main insert grade based on cutting speed and conditions for each work material.



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ROTATING TOOL INSERTS

## CUTTING CONDITIONS



Stable Cutting

Continuous Cutting  
Constant Depth of Cut  
Pre-Machined  
Securely Clamped Component

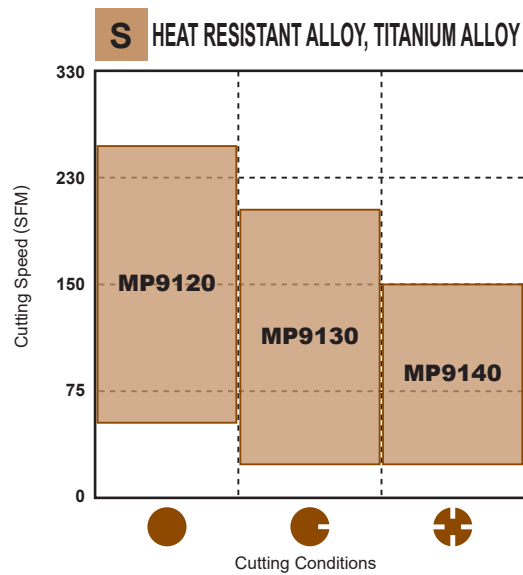
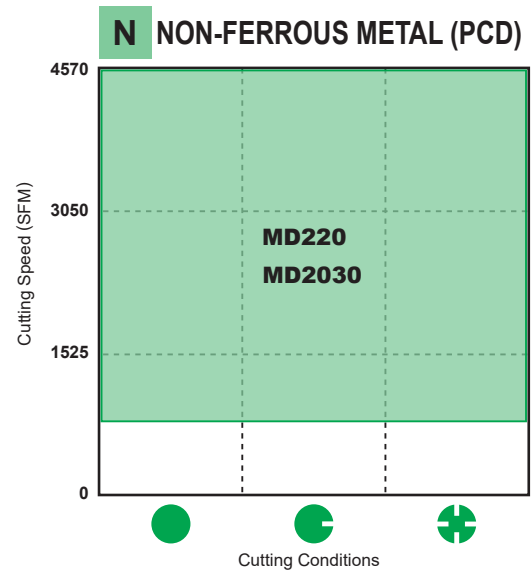
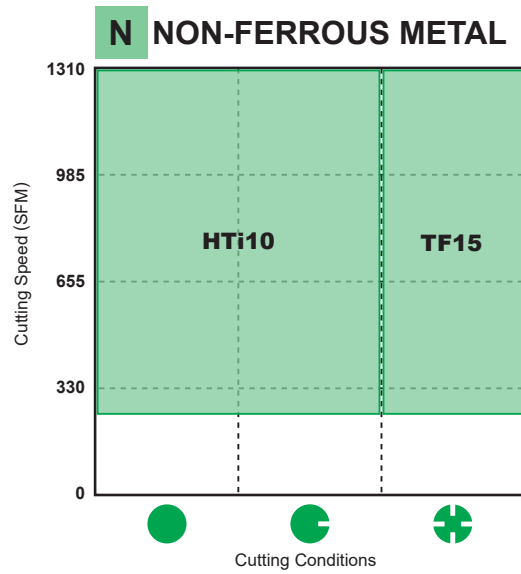


General Cutting



Unstable Cutting

Heavy Interrupted Cutting  
Irregular Depth of Cut  
Low Clamping Rigidity



K

ROTATING TOOL INSERTS

# COATED CARBIDE (CVD&PVD)

## <CVD>

- Special tough fibrous structure improves wear and fracture resistance.
- It covers a wide application range and reduces the number of tools required.

## <PVD>

- PVD coating prolongs tool life when compared to cemented carbide under the same cutting conditions.
- Coating of tools with sharp edges is possible without softening or changing the quality of the substrate.

## SELECTION STANDARD

### MILLING

| Work Material                         | Recommended Grade | Recommended Cutting Speed (SFM) | ISO                       | Application Range |
|---------------------------------------|-------------------|---------------------------------|---------------------------|-------------------|
| P<br>Steel                            | F7030             | 655 (490 – 820)                 | P<br>10<br>20<br>30<br>40 |                   |
|                                       | MC7020            | 655 (490 – 820)                 |                           |                   |
|                                       | MP6120            | 490 (330 – 655)                 |                           |                   |
|                                       | MP6130            | 490 (330 – 655)                 |                           |                   |
|                                       | VP15TF            | 490 (330 – 655)                 |                           |                   |
| M<br>Stainless Steel                  | F7030             | 655 (490 – 820)                 | M<br>10<br>20<br>30<br>40 |                   |
|                                       | MC7020            | 720 (560 – 885)                 |                           |                   |
|                                       | MP7030            | 490 (330 – 655)                 |                           |                   |
|                                       | MP7130            | 490 (330 – 655)                 |                           |                   |
|                                       | MP7140            | 490 (330 – 655)                 |                           |                   |
|                                       | VP15TF            | 490 (330 – 655)                 |                           |                   |
| K<br>Cast Iron                        | MC5020            | 590 (330 – 820)                 | K<br>10<br>20<br>30       |                   |
|                                       | VP15TF            | 490 (330 – 655)                 |                           |                   |
| N<br>Aluminum Alloy                   | LC15TF            | 3280 (655 – 9840)               | N<br>10<br>20<br>30       |                   |
| S<br>Heat Resistant Alloy<br>Ti Alloy | MP9120            | 100 (65 – 130)                  | S<br>10<br>20<br>30<br>40 |                   |
|                                       | VP15TF            | 100 (65 – 130)                  |                           |                   |
|                                       | MP9130            | 80 (65 – 115)                   |                           |                   |
|                                       | NEW MP9140        | 65 (50 – 100)                   |                           |                   |
| H<br>Hardened Steel                   | MP8010            | 260 (165 – 395)                 | H<br>10<br>20<br>30       |                   |
|                                       | VP15TF            | 260 (165 – 395)                 |                           |                   |

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ROTATING TOOL INSERTS

## ■ GRADE CHARACTERISTICS

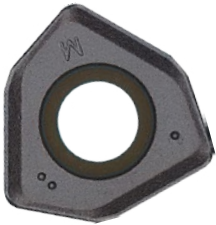
| Grade         | Substrate      | Coating Layer                                    |           |
|---------------|----------------|--------------------------------------------------|-----------|
|               | Hardness (HRA) | Composition                                      | Thickness |
| <b>MC5020</b> | 91.0           | TiCN-Al <sub>2</sub> O <sub>3</sub> -Ti Compound | Thick     |
| <b>MC7020</b> | 88.8           | TiCN-Al <sub>2</sub> O <sub>3</sub> Compound     | Thick     |
| <b>FH7020</b> | 88.8           | TiCN-Al <sub>2</sub> O <sub>3</sub> -Ti Compound | Thick     |
| <b>F7030</b>  | 88.8           | TiCN-Al <sub>2</sub> O <sub>3</sub> -TiN         | Thin      |
| <b>MP6120</b> | 91.5           | (Al,Ti,Cr)N                                      | Thin      |
| <b>MP6130</b> | 90.5           | (Al,Ti,Cr)N                                      | Thin      |
| <b>MP7030</b> | 90.5           | (Al,Ti)N-Ti Compound                             | Thin      |
| <b>MP7130</b> | 90.5           | (Al,Ti)N-Ti Compound                             | Thin      |
| <b>MP7140</b> | 88.8           | (Al,Ti)N-Ti Compound                             | Thin      |

| Grade             | Substrate      | Coating Layer |           |
|-------------------|----------------|---------------|-----------|
|                   | Hardness (HRA) | Composition   | Thickness |
| <b>MP8010</b>     | 93.5           | (Al,Ti,Si)N   | Thin      |
| <b>MP9120</b>     | 91.5           | (Al,Ti,Cr)N   | Thin      |
| <b>MP9130</b>     | 90.5           | (Al,Ti,Cr)N   | Thin      |
| <b>NEW MP9140</b> | 89.0           | Al-(Al,Ti)N   | Thin      |
| <b>VP15TF</b>     | 91.5           | (Al,Ti)N      | Thin      |
| <b>VP20RT</b>     | 90.5           | (Al,Ti)N      | Thin      |
| <b>VP30RT</b>     | 88.8           | (Al,Ti)N      | Thin      |
| <b>UP20M</b>      | 90.5           | Ti Compound   | Thin      |

Note 1) Internal hardness represent typical values shown as hardness.

## For machining of steels and stainless steels

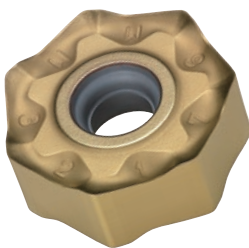
### MC7020



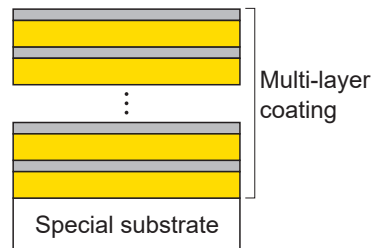
The micro-grain wear resistant Al<sub>2</sub>O<sub>3</sub> and fibrous TiCN layers deliver excellent wear resistance in high speed cutting. Use of a specially developed cemented carbide that provides superior resistance to fracture and thermal cracking prevents the cutting edge from sudden fracturing.

## For machining of stainless steel

### MP7030



MP7030 has a multi-layer coating based on newly developed Ti-compound. It provides superior wear and fracture resistance in stainless steel machining. A special tough cemented carbide substrate gives excellent performance in machining of difficult-to-cut materials such as stainless steel.



## Heat-resistant Alloy, Cutting For Titanium Alloy

### MP9130



An enhanced super fine cemented carbide substrate has increased toughness while maintaining hardness. The Al-Ti-Cr-N accumulating coating ensures optimum heat and wear resistance. The combination of these properties gives excellent fracture resistance and welding resistance because of low coefficient of friction when machining titanium alloy.

**NEW**

### MP9140



The new technology Al-(Al, Ti)N coating provides stabilisation of the high hardness phase and succeeds in dramatically improving wear, crater and welding resistance.

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ROTATING TOOL INSERTS

# CERMET

- NX2525 for high speed milling.
- MX3030, NX4545 for general milling.

## ■ SELECTION STANDARD

### MILLING

| Work Material                                                                                   | Recommended Grade              | Recommended Cutting Speed (SFM) | ISO                                                                                           | Application Range |
|-------------------------------------------------------------------------------------------------|--------------------------------|---------------------------------|-----------------------------------------------------------------------------------------------|-------------------|
| <div> <div>P</div> <div>M</div> <div>K</div> </div> <div>Steel</div> <div>Stainless Steel</div> | <b>NX2525</b>                  | 820<br>(490 — 1150)             | <div> <div>P</div> <div>M</div> <div>K</div> </div> <div>10</div> <div>20</div> <div>30</div> |                   |
|                                                                                                 | <b>MX3030</b><br><b>NX4545</b> | 490<br>(390 — 590)              |                                                                                               |                   |
| <div> <div>P</div> <div>M</div> <div>K</div> </div> <div>Cast Iron</div>                        | <b>NX2525</b>                  | 655<br>(490 — 985)              | <div> <div>P</div> <div>M</div> <div>K</div> </div> <div>10</div> <div>20</div>               |                   |
|                                                                                                 | <b>MX3030</b>                  | 490<br>(390 — 590)              |                                                                                               |                   |

Note 1) In case of wet cutting, please use coated carbide VP15TF for steel cutting and coated carbide MC5020 for cast iron cutting.

## ■ GRADE CHARACTERISTICS

| Grade         | Hardness (HRA) |
|---------------|----------------|
| <b>NX2525</b> | 92.2           |
| <b>MX3030</b> | 90.0           |
| <b>NX4545</b> | 90.0           |

Note 1) Internal hardness represent typical values shown as hardness.

# CEMENTED CARBIDE

● Available grade series are UTi20T for steel and cast iron, and HTi10 for cast iron, non-ferrous metal and non-metal.

## SELECTION STANDARD

### MILLING

| Work Material          | Recommended Grade | Recommended Cutting Speed (SFM) | ISO                 | Application Range |
|------------------------|-------------------|---------------------------------|---------------------|-------------------|
| P<br>Steel             | UTi20T            | 395<br>(165 — 590)              | P<br>10<br>20<br>30 |                   |
|                        |                   |                                 |                     | UTi20T            |
|                        |                   |                                 |                     |                   |
| M<br>Stainless Steel   | UTi20T            | 395<br>(165 — 590)              | M<br>10<br>20<br>30 |                   |
|                        |                   |                                 |                     | UTi20T            |
|                        |                   |                                 |                     |                   |
| K<br>Cast Iron         | HTi10             | 330<br>(165 — 490)              | K<br>10<br>20<br>30 | HTi10             |
|                        | UTi20T            | 395<br>(165 — 590)              |                     | UTi20T            |
|                        |                   |                                 |                     |                   |
| N<br>Non-Ferrous Metal | HTi10<br>TF15     | 1310<br>(985 — 1640)            | N<br>10<br>20<br>30 | HTi10             |
|                        |                   |                                 |                     | TF15              |
|                        |                   |                                 |                     |                   |

## MAIN COMPONENT AND APPLICATION

| ISO    | Main Component | Characteristics                    | Work Material                                            |
|--------|----------------|------------------------------------|----------------------------------------------------------|
| P<br>M | WC-TiC-TaC-Co  | Heat / Deformation resistance.     | Carbon steel, Alloy steel, Stainless steel and Cast iron |
| K<br>N | WC-Co          | High rigidity and wear resistance. | Cast iron, Non-Ferrous metals and Non-metal              |

## GRADE CHARACTERISTICS

| ISO    | Grade  | Hardness (HRA) |
|--------|--------|----------------|
| P<br>M | UTi20T | 90.5           |
| K<br>N | HTi05T | 92.5           |
|        | HTi10  | 92.0           |
| N      | TF15   | 91.5           |

Note 1) Internal hardness represent typical values shown as hardness.

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ROTATING TOOL INSERTS

# CBN (SINTERED CBN)



- MB710 and MB730 for cast iron cutting.
- BC5030 for high speed machining of cast irons available.
- Due to the combination of the BC5030 insert geometry and the AOX allows the use of up to 16 corners per insert, enabling cost effective high efficiency machining.

## SELECTION STANDARD / RECOMMENDED CUTTING CONDITIONS

### FINISHING

| Work Material  |            | Structure            | Cutting Speed (SFM) |      |       |      |      | Feed per Tooth (IPT) | Depth of Cut (inch) | Coolant |
|----------------|------------|----------------------|---------------------|------|-------|------|------|----------------------|---------------------|---------|
|                |            |                      | 820                 | 1640 | 2460  | 3280 | 4100 |                      |                     |         |
| Grey Cast Iron | AISI No35B | Ferritic + Pearlitic | MB710               |      | MB730 |      |      | —.012                | —.020               | Dry     |
|                | AISI No45B | Pearlitic            |                     |      |       |      |      |                      |                     |         |

### ROUGHING

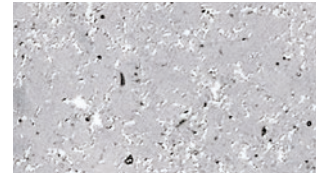
| Work Material  |            | Structure | Cutting Speed (SFM) |      |        |      |      | Feed per Tooth (IPT) | Depth of Cut (inch) | Coolant |
|----------------|------------|-----------|---------------------|------|--------|------|------|----------------------|---------------------|---------|
|                |            |           | 820                 | 1640 | 3280   | 4920 | 6560 |                      |                     |         |
| Grey Cast Iron | AISI No35B | Pearlitic |                     |      | BC5030 |      |      | —.006                | —.118               | Dry     |

## FEATURES AND BASE

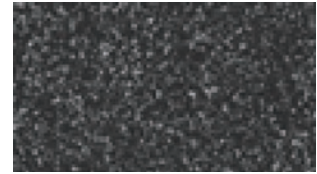
| Grade  | Application                                                                                                | Features                                                                                                                                                                                                                         | Main Component                               | Coating Layer |
|--------|------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|---------------|
| MB710  | For General Cutting                                                                                        | General purpose grade with well balanced wear and fracture resistance.                                                                                                                                                           | CBN<br>TiC<br>Al <sub>2</sub> O <sub>3</sub> | —             |
| MB730  | For High Speed Cutting<br>For interrupted Cutting                                                          | Has the largest CBN content and therefore displays good thermal conductivity. It is suitable for the high temperatures that are generated in high speed cutting.                                                                 | CBN (High Content)<br>Co Base Alloy          | —             |
| BC5030 | For high-speed machining at large depths of cut<br>High-speed interrupted machining at large depths of cut | High CBN content and high thermal conductivity. The whole insert is composed of sintered CBN. This enables high speed, high efficiency machining at larger depths of cut. The coated grade for easy recognition of used corners. | CBN<br>AlN                                   | TiN           |

# PCD (SINTERED DIAMOND)

- Suitable for non-ferrous metals cutting such as aluminum alloy.
- Suitable for extremely high speed finishing.



Micro-Structure of MD220



Micro-Structure of MD2030

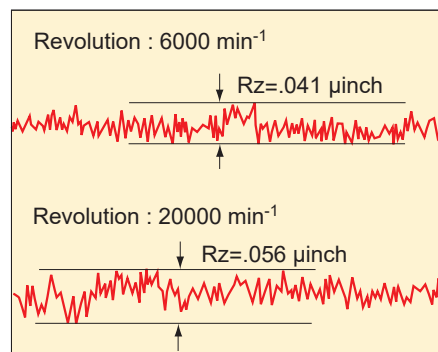
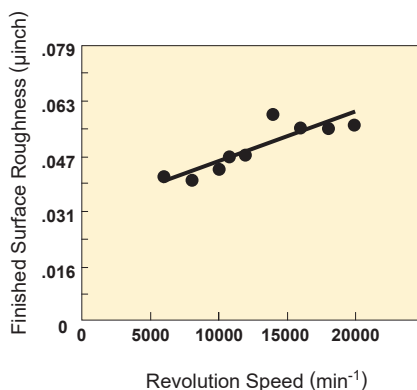
## ■ GRADE FEATURES

| Grade         | Features                                                                                                                                                               |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>MD220</b>  | Excellent in the balance between wear resistance and fracture resistance.<br>For a wide range of tooling applications.                                                 |
| <b>MD2030</b> | Improved fracture resistance when used in unstable applications.<br>The stability of the cutting edge can meet a wide variety of work material and cutting conditions. |

## ■ RECOMMENDED CUTTING CONDITIONS

| Work Material               | Cutting Speed (SFM) | Grade                         | Feed per Tooth (IPT) | Depth of Cut (inch) |
|-----------------------------|---------------------|-------------------------------|----------------------|---------------------|
| Aluminum Alloy<br>(Si ≤12%) | 3280—19685          | <b>MD220</b><br><b>MD2030</b> | —.012                | —.020               |
| Aluminum Alloy<br>(Si ≥13%) | 655—2625            |                               |                      |                     |

## ■ CUTTING PERFORMANCE



<Cutting Conditions>

Work Material : Aluminum Alloy  
 Insert : NP-GDCW1240PDFR2  
 Grade : MD220  
 Tool : V10000R0406D  
 Feed per Tooth : .008 IPT  
 Depth of Cut : .020 inch  
 Width of Cut : 3.150 inch  
 Dry Cutting

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ROTATING TOOL INSERTS

# CLASSIFICATION

| Order Number      | (ISO) Number      | Cutter Type                                                                         | Page | Order Number      | (ISO) Number        | Cutter Type                                                                           | Page                                                                                  |
|-------------------|-------------------|-------------------------------------------------------------------------------------|------|-------------------|---------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| AEMW150304ER      | AEMW150304ER      | BAE500                                                                              | K030 | APMT1135PDER-M0   | APMT1135PDER-M0     | BAP300                                                                                | K031                                                                                  |
| AEMW150308ER      | AEMW150308ER      |    |      | APMT1135PDER-M1   | APMT1135PDER-M1     |    |                                                                                       |
|                   |                   |                                                                                     |      | APMT1135PDER-M2   | APMT1135PDER-M2     |                                                                                       |                                                                                       |
| AEMW19T304ER      | AEMW19T304ER      | BAE600                                                                              | K031 | APGT1604PDFR-G2   | APGT1604PDFR-G2     | BAP400                                                                                | K031                                                                                  |
| AEMW19T308ER      | AEMW19T308ER      |    |      |                   |                     |    |                                                                                       |
|                   |                   |                                                                                     |      |                   |                     |                                                                                       |                                                                                       |
| AOGT123602PEFR-GM | AOGT123602PEFR-GM | APX3000                                                                             | K026 | APMT1604PDER-H1   | APMT1604PDER-H1     |    | K031                                                                                  |
| AOGT123604PEFR-GM | AOGT123604PEFR-GM | ⬇L096                                                                               |      | APMT1604PDER-H2   | APMT1604PDER-H2     |                                                                                       |                                                                                       |
| AOGT123608PEFR-GM | AOGT123608PEFR-GM |    |      | APMT1604PDER-H4   | APMT1604PDER-H4     |                                                                                       |                                                                                       |
|                   |                   |                                                                                     | K026 | APMT1604PDER-H6   | APMT1604PDER-H6     |    | K031                                                                                  |
| AOMT123604PEER-H  | AOMT123604PEER-H  |    |      | APMT1604PDER-H8   | APMT1604PDER-H8     |                                                                                       |                                                                                       |
| AOMT123608PEER-H  | AOMT123608PEER-H  |                                                                                     |      | APMT1604PDER-M2   | APMT1604PDER-M2     |                                                                                       |                                                                                       |
| AOMT123616PEER-H  | AOMT123616PEER-H  |                                                                                     |      |                   |                     |                                                                                       |                                                                                       |
|                   |                   |                                                                                     | K026 | CCMX083508ENA     | CCMX083508EN-A      | LER                                                                                   | K035                                                                                  |
| AOMT123602PEER-M  | AOMT123602PEER-M  |    |      | CCMX09T308ENA     | CCMX09T308EN-A      | ⬇L194                                                                                 |                                                                                       |
| AOMT123604PEER-M  | AOMT123604PEER-M  |                                                                                     |      |                   |                     |    |                                                                                       |
| AOMT123608PEER-M  | AOMT123608PEER-M  |                                                                                     |      |                   |                     |                                                                                       | K035                                                                                  |
| AOMT123610PEER-M  | AOMT123610PEER-M  |                                                                                     |      |                   | CCMX09T308ENB       | CCMX09T308EN-B                                                                        |                                                                                       |
| AOMT123612PEER-M  | AOMT123612PEER-M  |                                                                                     |      |                   |                     |                                                                                       |                                                                                       |
| AOMT123616PEER-M  | AOMT123616PEER-M  |                                                                                     |      |                   |                     |                                                                                       |                                                                                       |
| AOMT123620PEER-M  | AOMT123620PEER-M  |                                                                                     |      |                   |                     |                                                                                       |                                                                                       |
| AOMT123624PEER-M  | AOMT123624PEER-M  |                                                                                     |      |                   |                     |                                                                                       |                                                                                       |
| AOMT123630PEER-M  | AOMT123630PEER-M  |                                                                                     |      |                   |                     |                                                                                       |                                                                                       |
| AOMT123632PEER-M  | AOMT123632PEER-M  |                                                                                     |      |                   |                     |                                                                                       |                                                                                       |
| AOMT184804PEER-H  | AOMT184804PEER-H  | APX4000                                                                             | K026 | CPMT1205ZPEN-M2   | CPMT1205ZPEN-M2     | PMR                                                                                   | K036                                                                                  |
| AOMT184808PEER-H  | AOMT184808PEER-H  | ⬇L110                                                                               |      | CPMT1205ZPEN-M3   | CPMT1205ZPEN-M3     | ⬇L291                                                                                 |                                                                                       |
| AOMT184816PEER-H  | AOMT184816PEER-H  |  |      |                   |                     |  |                                                                                       |
| AOMT184832PEER-H  | AOMT184832PEER-H  |  | K026 | GOER1404PXFR2     | GOER1404PXFR2       | FMAX                                                                                  | K051                                                                                  |
| AOMT184840PEER-H  | AOMT184840PEER-H  |                                                                                     |      | GOER1408PXFR2     | GOER1408PXFR2       | ⬇L070                                                                                 |                                                                                       |
| AOMT184850PEER-H  | AOMT184850PEER-H  |                                                                                     |      |                   |                     |  |                                                                                       |
| AOMT184864PEER-H  | AOMT184864PEER-H  |                                                                                     |      |                   |                     |                                                                                       | K051                                                                                  |
| AOMT184804PEER-M  | AOMT184804PEER-M  |                                                                                     |      |                   |                     |                                                                                       |                                                                                       |
| AOMT184808PEER-M  | AOMT184808PEER-M  |                                                                                     |      |                   |                     |                                                                                       | K051                                                                                  |
| AOMT184810PEER-M  | AOMT184810PEER-M  |                                                                                     |      |                   | NEW GOER1408PXFR2-8 | GOER1408PXFR2-8                                                                       |                                                                                       |
| AOMT184812PEER-M  | AOMT184812PEER-M  |                                                                                     |      |                   |                     |                                                                                       |  |
| AOMT184816PEER-M  | AOMT184816PEER-M  |                                                                                     |      |                   |                     |                                                                                       |                                                                                       |
| AOMT184820PEER-M  | AOMT184820PEER-M  |                                                                                     |      |                   |                     |                                                                                       |                                                                                       |
| APGT1135PDFR-G2   | APGT1135PDFR-G2   | BAP300                                                                              | K031 | NEW GOER1401ZXFR2 | GOER1401ZXFR2       |  | K051                                                                                  |
|                   |                   |  |      |                   |                     |                                                                                       |                                                                                       |
|                   |                   |                                                                                     |      |                   |                     |                                                                                       |                                                                                       |
| APMT1135PDER-H1   | APMT1135PDER-H1   |  | K031 |                   |                     |                                                                                       |                                                                                       |
| APMT1135PDER-H2   | APMT1135PDER-H2   |                                                                                     |      |                   |                     |                                                                                       |                                                                                       |
| APMT1135PDER-H6   | APMT1135PDER-H6   |                                                                                     |      |                   |                     |                                                                                       |                                                                                       |

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ROTATING TOOL INSERTS

| Order Number             | (ISO) Number      | Cutter Type                                                                                                              | Page | Order Number                | (ISO) Number     | Cutter Type                                                                                                                  | Page |
|--------------------------|-------------------|--------------------------------------------------------------------------------------------------------------------------|------|-----------------------------|------------------|------------------------------------------------------------------------------------------------------------------------------|------|
| <b>HNMX1206EN06-R</b>    | HNMX1206EN06-R    | <b>BMR</b><br>⊖L292<br>                 | K032 | LNGU130804PNER-M            | LNGU130804PNER-M | <b>VAS400</b><br>Side Cutter<br>⊖L088<br> | K043 |
|                          |                   |                                                                                                                          |      | LNGU130804PNEL-M            | LNGU130804PNEL-M |                                                                                                                              |      |
|                          |                   |                                                                                                                          |      | LNGU130808PNER-M            | LNGU130808PNER-M |                                                                                                                              |      |
|                          |                   |                                                                                                                          |      | LNGU130808PNEL-M            | LNGU130808PNEL-M |                                                                                                                              |      |
| <b>HNMX1206ER12-R</b>    | HNMX1206ER12-R    |                                         | K032 | LNGU130812PNER-M            | LNGU130812PNER-M |                                                                                                                              |      |
|                          |                   |                                                                                                                          |      | LNGU130812PNEL-M            | LNGU130812PNEL-M |                                                                                                                              |      |
|                          |                   |                                                                                                                          |      | LNGU130816PNER-M            | LNGU130816PNER-M |                                                                                                                              |      |
|                          |                   |                                                                                                                          |      | LNGU130816PNEL-M            | LNGU130816PNEL-M |                                                                                                                              |      |
| <b>JOMW06T215ZZSR-FT</b> | JOMW06T215ZZSR-FT | <b>AJX</b><br>⊖L206<br>                 | K025 | LNGU130820PNER-M            | LNGU130820PNER-M |                                                                                                                              |      |
| <b>JOMW080320ZZSR-FT</b> | JOMW080320ZZSR-FT |                                                                                                                          |      | LNGU130820PNEL-M            | LNGU130820PNEL-M |                                                                                                                              |      |
| <b>JDMW09T320ZDSR-FT</b> | JDMW09T320ZDSR-FT |                                                                                                                          |      | LNGU130824PNER-M            | LNGU130824PNER-M |                                                                                                                              |      |
| <b>JDMW120420ZDSR-FT</b> | JDMW120420ZDSR-FT |                                                                                                                          |      | LNGU130824PNEL-M            | LNGU130824PNEL-M |                                                                                                                              |      |
| <b>JDMW140520ZDSR-FT</b> | JDMW140520ZDSR-FT |                                                                                                                          |      | LNGU130830PNER-M            | LNGU130830PNER-M |                                                                                                                              |      |
| <b>JOMT06T216ZZER-JL</b> | JOMT06T216ZZER-JL |                                         | K025 | LNGU130830PNEL-M            | LNGU130830PNEL-M |                                                                                                                              |      |
| <b>JOMT080322ZZER-JL</b> | JOMT080322ZZER-JL |                                                                                                                          |      | LNGU130840PNER-M            | LNGU130840PNER-M |                                                                                                                              |      |
| <b>JDMT09T323ZDER-JL</b> | JDMT09T323ZDER-JL |                                                                                                                          |      | LNGU130840PNEL-M            | LNGU130840PNEL-M |                                                                                                                              |      |
| <b>JDMT120423ZDER-JL</b> | JDMT120423ZDER-JL |                                                                                                                          |      | LNGU130850PNER-M            | LNGU130850PNER-M |                                                                                                                              |      |
| <b>JDMT140523ZDER-JL</b> | JDMT140523ZDER-JL |                                                                                                                          |      | LNGU130850PNEL-M            | LNGU130850PNEL-M |                                                                                                                              |      |
| <b>JOMT06T215ZZSR-JM</b> | JOMT06T215ZZSR-JM |                                         | K025 | <b>NEW</b> LNGU130804PNER-R | LNGU130804PNER-R |                                                                                                                              |      |
| <b>JOMT080320ZZSR-JM</b> | JOMT080320ZZSR-JM |                                                                                                                          |      | <b>NEW</b> LNGU130804PNEL-R | LNGU130804PNEL-R |                                                                                                                              |      |
| <b>JDMT09T320ZDSR-JM</b> | JDMT09T320ZDSR-JM |                                                                                                                          |      | <b>NEW</b> LNGU130808PNER-R | LNGU130808PNER-R |                                                                                                                              |      |
| <b>JDMT120420ZDSR-JM</b> | JDMT120420ZDSR-JM |                                                                                                                          |      | <b>NEW</b> LNGU130808PNEL-R | LNGU130808PNEL-R |                                                                                                                              |      |
| <b>JDMT140520ZDSR-JM</b> | JDMT140520ZDSR-JM |                                                                                                                          |      | <b>NEW</b> LNGU130812PNER-R | LNGU130812PNER-R |                                                                                                                              |      |
| <b>JDMT120420ZDSR-ST</b> | JDMT120420ZDSR-ST |                                       | K025 | <b>NEW</b> LNGU130812PNEL-R | LNGU130812PNEL-R |                                                                                                                              |      |
| <b>JDMT140520ZDSR-ST</b> | JDMT140520ZDSR-ST |                                                                                                                          |      | <b>NEW</b> LNGU130816PNER-R | LNGU130816PNER-R |                                                                                                                              |      |
|                          |                   |                                                                                                                          |      | <b>NEW</b> LNGU130816PNEL-R | LNGU130816PNEL-R |                                                                                                                              |      |
|                          |                   |                                                                                                                          |      | <b>NEW</b> LNGU130820PNER-R | LNGU130820PNER-R |                                                                                                                              |      |
| <b>JOMU140715ZZER-L</b>  | JOMU140715ZZER-L  | <b>WJX</b><br>⊖L224<br><b>NEW</b><br> | K047 | <b>NEW</b> LNGU130820PNEL-R | LNGU130820PNEL-R |                                                                                                                              |      |
| <b>JOMU140715ZZER-M</b>  | JOMU140715ZZER-M  |                                                                                                                          |      | <b>NEW</b> LNGU130824PNER-R | LNGU130824PNER-R |                                                                                                                              |      |
| <b>JOMU140715ZZER-R</b>  | JOMU140715ZZER-R  |                                                                                                                          |      | <b>NEW</b> LNGU130824PNEL-R | LNGU130824PNEL-R |                                                                                                                              |      |
|                          |                   |                                                                                                                          |      | <b>NEW</b> LNGU130830PNER-R | LNGU130830PNER-R |                                                                                                                              |      |
|                          |                   |                                                                                                                          |      | <b>NEW</b> LNGU130830PNEL-R | LNGU130830PNEL-R |                                                                                                                              |      |
| <b>JPMT060204-E</b>      | JPMT060204-E      |                                       | K049 | <b>NEW</b> LNGU130840PNER-R | LNGU130840PNER-R |                                                                                                                              |      |
|                          |                   |                                                                                                                          |      | <b>NEW</b> LNGU130840PNEL-R | LNGU130840PNEL-R |                                                                                                                              |      |
|                          |                   |                                                                                                                          |      | <b>NEW</b> LNGU130850PNER-R | LNGU130850PNER-R |                                                                                                                              |      |
|                          |                   |                                                                                                                          |      | <b>NEW</b> LNGU130850PNEL-R | LNGU130850PNEL-R |                                                                                                                              |      |
| <b>JPMX140412-JM</b>     | JPMX140412-JM     | <b>SPX</b><br>⊖L180<br>               | K039 |                             |                  |                                                                                                                              |      |
| <b>JPMX190412-JM</b>     | JPMX190412-JM     |                                                                                                                          |      |                             |                  |                                                                                                                              |      |
|                          |                   |                                                                                                                          |      |                             |                  |                                                                                                                              |      |
| <b>JPMX140412-WH</b>     | JPMX140412-WH     |                                       | K039 |                             |                  |                                                                                                                              |      |
| <b>JPMX190412-WH</b>     | JPMX190412-WH     |                                                                                                                          |      |                             |                  |                                                                                                                              |      |
|                          |                   |                                                                                                                          |      |                             |                  |                                                                                                                              |      |

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| LNGU171004PNER-R  | LNGU171004PNER-R  | <b>VAS500</b><br><b>Side Cutter</b><br><b>⊖L092</b>  | K044 | LOGU0904020PNER-M | LOGU0904020PNER-M | <b>VPX200</b><br><b>⊖L124</b>   | K046 |
| LNGU171004PNEL-R  | LNGU171004PNEL-R  |                                                                                                                                       |      | LOGU0904040PNER-M | LOGU0904040PNER-M |                                                                                                                    |      |
| LNGU171008PNER-R  | LNGU171008PNER-R  |                                                                                                                                       |      | LOGU0904080PNER-M | LOGU0904080PNER-M |                                                                                                                    |      |
| LNGU171008PNEL-R  | LNGU171008PNEL-R  |                                                                                                                                       |      | LOGU0904100PNER-M | LOGU0904100PNER-M |                                                                                                                    |      |
| LNGU171012PNER-R  | LNGU171012PNER-R  |                                                                                                                                       |      | LOGU0904120PNER-M | LOGU0904120PNER-M |                                                                                                                    |      |
| LNGU171012PNEL-R  | LNGU171012PNEL-R  |                                                                                                                                       |      | LOGU0904160PNER-M | LOGU0904160PNER-M |                                                                                                                    |      |
| LNGU171016PNER-R  | LNGU171016PNER-R  |                                                                                                                                       |      | LOGU0904020PNFR-M | LOGU0904020PNFR-M |                                                                                                                    |      |
| LNGU171016PNEL-R  | LNGU171016PNEL-R  |                                                                                                                                       |      | LOGU0904040PNFR-M | LOGU0904040PNFR-M |                                                                                                                    |      |
| LNGU171020PNER-R  | LNGU171020PNER-R  |                                                                                                                                       |      | LOGU0904080PNFR-M | LOGU0904080PNFR-M |                                                                                                                    |      |
| LNGU171020PNEL-R  | LNGU171020PNEL-R  |                                                                                                                                       |      | LOGU0904100PNFR-M | LOGU0904100PNFR-M |                                                                                                                    |      |
| LNGU171024PNER-R  | LNGU171024PNER-R  |                                                                                                                                       |      | LOGU0904120PNFR-M | LOGU0904120PNFR-M |                                                                                                                    |      |
| LNGU171024PNEL-R  | LNGU171024PNEL-R  |                                                                                                                                       |      | LOGU0904160PNFR-M | LOGU0904160PNFR-M |                                                                                                                    |      |
| LNGU171030PNER-R  | LNGU171030PNER-R  |                                                                                                                                       |      | LOGU1207020PNER-M | LOGU1207020PNER-M | <b>VPX300</b><br><b>⊖L140</b>  | K047 |
| LNGU171030PNEL-R  | LNGU171030PNEL-R  |                                                                                                                                       |      | LOGU1207040PNER-M | LOGU1207040PNER-M |                                                                                                                    |      |
| LNGU171040PNER-R  | LNGU171040PNER-R  |                                                                                                                                       |      | LOGU1207080PNER-M | LOGU1207080PNER-M |                                                                                                                    |      |
| LNGU171040PNEL-R  | LNGU171040PNEL-R  |                                                                                                                                       |      | LOGU1207100PNER-M | LOGU1207100PNER-M |                                                                                                                    |      |
| LNGU171050PNER-R  | LNGU171050PNER-R  |                                                                                                                                       |      | LOGU1207120PNER-M | LOGU1207120PNER-M |                                                                                                                    |      |
| LNGU171050PNEL-R  | LNGU171050PNEL-R  |                                                                                                                                       |      | LOGU1207160PNER-M | LOGU1207160PNER-M |                                                                                                                    |      |
| LNGU171060PNER-R  | LNGU171060PNER-R  |                                                                                                                                       |      | LOGU1207200PNER-M | LOGU1207200PNER-M |                                                                                                                    |      |
| LNGU171060PNEL-R  | LNGU171060PNEL-R  |                                                                                                                                       |      | LOGU1207240PNER-M | LOGU1207240PNER-M |                                                                                                                    |      |
| LNGU171070PNER-R  | LNGU171070PNER-R  |                                                                                                                                       |      | LOGU1207300PNER-M | LOGU1207300PNER-M |                                                                                                                    |      |
| LNGU171070PNEL-R  | LNGU171070PNEL-R  |                                                                                                                                       |      | LOGU1207320PNER-M | LOGU1207320PNER-M |                                                                                                                    |      |
| LOGU0904020PNER-L | LOGU0904020PNER-L | <b>VPX200</b><br><b>⊖L124</b>                      | K046 | LOGU1207020PNFR-M | LOGU1207020PNFR-M |                                                                                                                    |      |
| LOGU0904040PNER-L | LOGU0904040PNER-L |                                                                                                                                       |      | LOGU1207040PNFR-M | LOGU1207040PNFR-M |                                                                                                                    |      |
| LOGU0904080PNER-L | LOGU0904080PNER-L |                                                                                                                                       |      | LOGU1207080PNFR-M | LOGU1207080PNFR-M |                                                                                                                    |      |
| LOGU0904100PNER-L | LOGU0904100PNER-L |                                                                                                                                       |      | LOGU1207100PNFR-M | LOGU1207100PNFR-M |                                                                                                                    |      |
| LOGU0904120PNER-L | LOGU0904120PNER-L |                                                                                                                                       |      | LOGU1207120PNFR-M | LOGU1207120PNFR-M |                                                                                                                    |      |
| LOGU0904160PNER-L | LOGU0904160PNER-L |                                                                                                                                       |      | LOGU1207160PNFR-M | LOGU1207160PNFR-M |                                                                                                                    |      |
| LOGU0904020PNFR-L | LOGU0904020PNFR-L |                                                                                                                                       |      | LOGU1207200PNFR-M | LOGU1207200PNFR-M |                                                                                                                    |      |
| LOGU0904040PNFR-L | LOGU0904040PNFR-L |                                                                                                                                       |      | LOGU1207240PNFR-M | LOGU1207240PNFR-M |                                                                                                                    |      |
| LOGU0904080PNFR-L | LOGU0904080PNFR-L |                                                                                                                                       |      | LOGU1207300PNFR-M | LOGU1207300PNFR-M |                                                                                                                    |      |
| LOGU0904100PNFR-L | LOGU0904100PNFR-L |                                                                                                                                       |      | LOGU1207320PNFR-M | LOGU1207320PNFR-M |                                                                                                                    |      |
| LOGU0904120PNFR-L | LOGU0904120PNFR-L |                                                                                                                                       |      |                   |                   |                                                                                                                    |      |
| LOGU0904160PNFR-L | LOGU0904160PNFR-L |                                                                                                                                       |      |                   |                   |                                                                                                                    |      |

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| MPMX120412-JM     | MPMX120412-JM     | SPX<br>⊕L180<br>                         | K039 |
| MPMX120412-WH     | MPMX120412-WH     |                                          | K039 |
| NNMU130508ZER-L   | NNMU130508ZER-L   | AHX440S<br>⊕L038<br>                     | K024 |
| NNMU130508ZEN-M   | NNMU130508ZEN-M   |                                                                                                                           |      |
| NNMU130532ZEN-M   | NNMU130532ZEN-M   |                                                                                                                           |      |
| NNMU130532ZEN-R   | NNMU130532ZEN-R   |                                                                                                                           |      |
| NNMU200608ZEN-HK  | NNMU200608ZEN-HK  | AHX640S<br>⊕L048<br>AHX640W<br>⊕L060<br> | K024 |
| NNMU200608ZEN-MK  | NNMU200608ZEN-MK  |                                          | K024 |
| NNMU200708ZEN-M   | NNMU200708ZEN-M   | AHX640S<br>⊕L048<br>                   | K024 |
| NNMU200708ZEN-MP  | NNMU200708ZEN-MP  |                                        | K024 |
| NNMU200712ZER-L   | NNMU200712ZER-L   |                                        | K025 |
| NNMU200712ZER-MM  | NNMU200712ZER-MM  |                                        | K024 |
| NP-GDCN2004PDSR3  | NP-GDCN2004PDSR3  | NF10000<br>                            | K051 |
| NP-WEEW13T3AGFR3C | NP-WEEW13T3AGFR3C | ASX445<br>⊕L030<br>                    | K052 |
| NP-WEEW13T3AGTR3C | NP-WEEW13T3AGTR3C |                                                                                                                           |      |
| NP-WFC42ZFER2     | NP-WFC42ZFER2     | BF407<br>                              | K052 |
| NP-WFC42ZFER6     | NP-WFC42ZFER6     |                                                                                                                           |      |

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| OEMX12T3ETR1    | OEMX12T3ETR1    | BOE<br>⊕L256<br>           | K032 |
| OEMX12T3ESR1    | OEMX12T3ESR1    |                                                                                                               |      |
| OEMX1705ETR1    | OEMX1705ETR1    |                                                                                                               |      |
| OEMX1705ESR1    | OEMX1705ESR1    |                                                                                                               |      |
| OEMX12T3EER1-JS | OEMX12T3EER1-JS |                            | K033 |
| OEMX12T3ETR1-JS | OEMX12T3ETR1-JS |                                                                                                               |      |
| OEMX1705EER1-JS | OEMX1705EER1-JS |                                                                                                               |      |
| OEMX1705ETR1-JS | OEMX1705ETR1-JS |                                                                                                               |      |
| OEMX12T3ETR1    | OEMX12T3ETR1    |                            | K050 |
| OEMX12T3ETR5    | OEMX12T3ETR5    |                                                                                                               |      |
| QOGT0830R-G1    | QOGT0830R-G1    | AQX<br>⊕L196<br>           | K027 |
| QOGT0934R-G1    | QOGT0934R-G1    |                                                                                                               |      |
| QOGT1443R-G1    | QOGT1443R-G1    |                                                                                                               |      |
| QOGT1651R-G1    | QOGT1651R-G1    |                                                                                                               |      |
| QOGT1959R-G1    | QOGT1959R-G1    |                                                                                                               |      |
| QOMT0830R-M2    | QOMT0830R-M2    |                            | K027 |
| QOMT0934R-M2    | QOMT0934R-M2    |                                                                                                               |      |
| QOMT1443R-M2    | QOMT1443R-M2    |                                                                                                               |      |
| QOMT1651R-M2    | QOMT1651R-M2    |                                                                                                               |      |
| QOMT1959R-M2    | QOMT1959R-M2    |                                                                                                               |      |
| QOGT0830R-G1    | QOGT0830R-G1    | AQX(METRIC)<br>⊕L196<br> | K027 |
| QOGT1035R-G1    | QOGT1035R-G1    |                                                                                                               |      |
| QOGT1342R-G1    | QOGT1342R-G1    |                                                                                                               |      |
| QOGT1651R-G1    | QOGT1651R-G1    |                                                                                                               |      |
| QOGT1856R-G1    | QOGT1856R-G1    |                                                                                                               |      |
| QOGT2062R-G1    | QOGT2062R-G1    |                                                                                                               |      |
| QOGT2576R-G1    | QOGT2576R-G1    |                                                                                                               |      |
| QOMT0830R-M2    | QOMT0830R-M2    |                          | K027 |
| QOMT1035R-M2    | QOMT1035R-M2    |                                                                                                               |      |
| QOMT1342R-M2    | QOMT1342R-M2    |                                                                                                               |      |
| QOMT1651R-M2    | QOMT1651R-M2    |                                                                                                               |      |
| QOMT1856R-M2    | QOMT1856R-M2    |                                                                                                               |      |
| QOMT2062R-M2    | QOMT2062R-M2    |                                                                                                               |      |
| QOMT2576R-M2    | QOMT2576R-M2    |                                                                                                               |      |
| RPHT1040M0E4-L  | RPHT1040M0E4-L  | ARP<br>⊕L236<br>         | K027 |
| RPHT1040M0E4-M  | RPHT1040M0E4-M  |                                                                                                               |      |
| RPHT1040M0E4-R  | RPHT1040M0E4-R  |                                                                                                               |      |
| RPHT1248M0E4-L  | RPHT1248M0E4-L  |                                                                                                               |      |
| RPHT1248M0E4-M  | RPHT1248M0E4-M  |                                                                                                               |      |
| RPHT1248M0E4-R  | RPHT1248M0E4-R  |                                                                                                               |      |
| RPMT1040M0E4-L  | RPMT1040M0E4-L  |                                                                                                               |      |
| RPMT1040M0E4-M  | RPMT1040M0E4-M  |                                                                                                               |      |
| RPMT1040M0E4-R  | RPMT1040M0E4-R  |                                                                                                               |      |
| RPMT1248M0E4-L  | RPMT1248M0E4-L  |                                                                                                               |      |
| RPMT1248M0E4-M  | RPMT1248M0E4-M  |                                                                                                               |      |
| RPMT1248M0E4-R  | RPMT1248M0E4-R  |                                                                                                               |      |

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| RDMW0517M0E    | RDMW0517M0E     | ARX(METRIC)<br>L248<br>                | K027 |
| RDMW0620M0E    | RDMW0620M0E     |                                                                                                                         |      |
| RDMW0724M0E    | RDMW0724M0E     |                                                                                                                         |      |
| REMX1705EN     | REMX1705EN      | BOE<br>L256<br>                        | K033 |
| REMX1705SN     | REMX1705SN      |                                                                                                                         |      |
| REMX12T3EN-JS  | REMX12T3EN-JS   |                                        | K033 |
| REMX1705EN-JS  | REMX1705EN-JS   |                                                                                                                         |      |
| RGEN2004EN     | RGEN2004M0EN    | SG20<br>                               | K038 |
| RGEN2004SN     | RGEN2004M0SN    |                                                                                                                         |      |
| RPMT07T200E-JS | RPMT07T200E-JS  | BRP<br>L252<br>                        | K033 |
| RPMT09T300E-JS | RPMT09T300E-JS  |                                                                                                                         |      |
| RPMT120400E-JS | RPMT120400E-JS  |                                       | K033 |
| RPMT150600E-JS | RPMT150600E-JS  |                                                                                                                         |      |
| RPMW120400E    | RPMW120400E     |                                                                                                                         |      |
| RPMW150600E    | RPMW150600E     |                                      | K038 |
| SDEN42AEN      | SDEN1203AEN     |                                                                                                                         |      |
| SDKN42AEN      | SDKN1203AEN     | Corner Angle 45°<br>15° Positive<br> | K048 |
| SDKN42AETN     | SDKN1203AETN    |                                                                                                                         |      |
| SDKN53AETN     | SDKN1504AETN    | SE415<br>                            | K037 |
| SEEN42EFFF1    | SEEN1203EFFF1   |                                                                                                                         |      |
| SEEN42EFER1    | SEEN1203EFER1   |                                      | K037 |
| SEEN42EFTR1    | SEEN1203EFTR1   |                                                                                                                         |      |
| SEEN42EFSR1    | SEEN1203EFSR1   |                                      | K037 |
| SEKN42EFSR1    | SEKN1203EFSR1   |                                                                                                                         |      |
| SEKN42EFTR1    | SEKN1203EFTR1   |                                      | K037 |
| SEKN42EFTR     | SEKN1203EFTR    |                                                                                                                         |      |
| SEER42EFER-JS  | SEER1203EFER-JS |                                      | K037 |
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| SECN42AFTN1     | SECN1203AFTN1   | SE445<br>            | K037 |
| SEEN42AFFN1     | SEEN1203AFFN1   |                                                                                                         |      |
| SEEN42AFEN1     | SEEN1203AFEN1   |                                                                                                         |      |
| SEEN42AFTN1     | SEEN1203AFTN1   |                      | K037 |
| SEEN42AFSN1     | SEEN1203AFSN1   |                                                                                                         |      |
| SEEN42AFXN1     | SEEN1203AFXN1   |                                                                                                         |      |
| SEKN42AFSN1     | SEKN1203AFSN1   |                      | K052 |
| SEKN42AFTN1     | SEKN1203AFTN1   |                                                                                                         |      |
| SEKN42AFTN      | SEKN1203AFTN    |                                                                                                         |      |
| SEER42AFEN-JS   | SEER1203AFEN-JS |                    | K037 |
| SEER42AFXN-JS   | SEER1203AFXN-JS |                                                                                                         |      |
| SECN42AFFR1     | SECN1203AFFR1   |                    | K052 |
|                 |                 |                                                                                                         |      |
| SEEN53EFER1     | SEEN1504EFER1   | SE515<br>          | K038 |
|                 |                 |                                                                                                         |      |
| SEEN53AFEN1     | SEEN1504AFEN1   | SE545<br>          | K038 |
| SEEN53AFTN1     | SEEN1504AFTN1   |                                                                                                         |      |
| SEEN53AFSN1     | SEEN1504AFSN1   |                    | K038 |
| SEKN53AFSN1     | SEKN1504AFSN1   |                                                                                                         |      |
| SEKN53AFTN1     | SEKN1504AFTN1   |                    | K038 |
| SEER53AFEN-JS   | SEER1504AFEN-JS |                                                                                                         |      |
| SEET13T3AGEN-JL | SEET13T3AGEN-JL | ASX445<br>L030<br> | K028 |
|                 |                 |                                                                                                         |      |
| SEMT13T3AGSN-JM | SEMT13T3AGSN-JM |                    | K029 |
|                 |                 |                                                                                                         |      |
| SEMT13T3AGSN-JH | SEMT13T3AGSN-JH |                    | K029 |
|                 |                 |                                                                                                         |      |
| SEMT13T3AGSN-FT | SEMT13T3AGSN-FT |                    | K029 |
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| SEGT13T3AGFN-JP | SEGT13T3AGFN-JP |                    | K029 |
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| <b>SEER43AFEN-JS</b>        | SEER1204AFEN-JS   | Corner Angle 45°<br>20° Positive<br>                | K048 |
|                             |                   |                                                                                                                                      |      |
| <b>SEKN42AGTN</b>           | SEKN1203AGTN      | Corner Angle 45°<br>20° Positive<br>                | K048 |
|                             |                   |                                                                                                                                      |      |
| <b>SFAN42ZFFR2</b>          | SFAN1203ZFFR2     | <b>BF407</b><br>                                    | K032 |
| <b>SFAN42ZFFL2</b>          | SFAN1203ZFFL2     |                                                                                                                                      |      |
| <b>SFCN42ZFFR2</b>          | SFCN1203ZFFR2     |                                                                                                                                      |      |
| <b>SFCN42ZFFR2</b>          | SFCN1203ZFFR2     |                                                     | K050 |
|                             |                   |                                                                                                                                      |      |
| <b>SL-ONEN120404ASN</b>     | SL-ONEN120404ASN  | <b>AOX445</b><br>L069<br>                           | K050 |
|                             |                   |                                                                                                                                      |      |
| <b>SNMN432</b>              | SNMN120408        | Negative<br>                                       | K049 |
| <b>SNMN433</b>              | SNMN120412        |                                                                                                                                      |      |
| <b>SNMU140812ANER-M</b>     | SNMU140812ANER-M  | <b>WSX445</b><br>L018<br>                         | K047 |
| <b>SNMU140812ANEL-M</b>     | SNMU140812ANEL-M  |                                                                                                                                      |      |
| <b>SNMU140812ANER-R</b>     | SNMU140812ANER-R  |                                                                                                                                      |      |
| <b>SNMU140812ANEL-R</b>     | SNMU140812ANEL-R  |                                                                                                                                      |      |
| <b>SNMU140812ANER-H</b>     | SNMU140812ANER-H  |                                                                                                                                      |      |
| <b>SNGU140812ANER-L</b>     | SNGU140812ANER-L  |                                                                                                                                      |      |
| <b>NEW SNGU140812ANEL-L</b> | SNGU140812ANEL-L  |                                                                                                                                      |      |
| <b>SNGU140812ANER-M</b>     | SNGU140812ANER-M  |                                                                                                                                      |      |
| <b>SNGU140812ANEL-M</b>     | SNGU140812ANEL-M  |                                                                                                                                      |      |
| <b>SNGU140812ANFR-L</b>     | SNGU140812ANFR-L  |                                                                                                                                      |      |
| <b>NEW SNGU140812ANFL-L</b> | SNGU140812ANFL-L  |                                                                                                                                      |      |
| <b>WNGU1406ANEN8C-M</b>     | WNGU1406ANEN8C-M  |                                                   | K048 |
|                             |                   |                                                                                                                                      |      |
| <b>SOET12T308PEER-JL</b>    | SOET12T308PEER-JL | <b>ASX400</b> L082<br>                            | K028 |
|                             |                   |                                                                                                                                      |      |
| <b>SOMT12T308PEER-JM</b>    | SOMT12T308PEER-JM | <b>ASX400</b> L082<br>ASX Side Cutter<br>L095<br> | K028 |
| <b>SOMT12T308PEEL-JM</b>    | SOMT12T308PEEL-JM |                                                                                                                                      |      |

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| <b>SOMT12T308PEER-JH</b> | SOMT12T308PEER-JH | <b>ASX400</b> L082<br>                            | K028 |
|                          |                   |                                                                                                                                      |      |
| <b>SOMT12T320PEER-FT</b> | SOMT12T320PEER-FT |                                                   | K028 |
|                          |                   |                                                                                                                                      |      |
| <b>SOGT12T308PEFR-JP</b> | SOGT12T308PEFR-JP |                                                   | K028 |
|                          |                   |                                                                                                                                      |      |
| <b>SONX1206PER</b>       | SONX1206PER       | <b>VOX400</b> L076<br>VOS Side Cutter<br>L094<br> | K046 |
| <b>SONX1206PEL</b>       | SONX1206PEL       |                                                                                                                                      |      |
| <b>SPEN42EEER1</b>       | SPEN1203EEER1     | <b>FBP415</b><br>                                 | K034 |
| <b>SPEN42EEEL1</b>       | SPEN1203EEEL1     |                                                                                                                                      |      |
| <b>SPNN42EEER1</b>       | SPNN1203EEER1     |                                                 | K035 |
| <b>SPNN42EEEL1</b>       | SPNN1203EEEL1     |                                                                                                                                      |      |
| <b>SPER42EEER-JS</b>     | SPER1203EEER-JS   |                                                 | K035 |
|                          |                   |                                                                                                                                      |      |
| <b>SPEN42EETR1</b>       | SPEN1203EETR1     |                                                 | K050 |
|                          |                   |                                                                                                                                      |      |
| <b>SPKN42EDR</b>         | SPKN1203EDR       | Corner Angle 15°<br>11° Positive<br>            | K048 |
| <b>SPKN53EDR</b>         | SPKN1504EDR       |                                                                                                                                      |      |
| <b>SPMB1204APT</b>       | SPMB1204APT       | <b>BSP</b><br>                                  | K033 |
|                          |                   |                                                                                                                                      |      |
| <b>SPMM432A</b>          | SPMT120408-A      | <b>TBE1</b><br>                                 | K042 |
|                          |                   |                                                                                                                                      |      |
| <b>SPMN421</b>           | SPMN120304        | <b>11° Positive</b><br>                         | K049 |
| <b>SPMN421T</b>          | SPMN120304T       |                                                                                                                                      |      |
| <b>SPMN422</b>           | SPMN120308        |                                                                                                                                      |      |
| <b>SPMN423</b>           | SPMN120312        |                                                                                                                                      |      |
| <b>SPMN432</b>           | SPMN120408        |                                                                                                                                      |      |
| <b>SPMN433</b>           | SPMN120412        |                                                                                                                                      |      |
| <b>SPMN532</b>           | SPMN150408        |                                                                                                                                      |      |

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| SPMW321       | SPMW090304    | CFSP<br>➔L260<br>           | K034 | SRM212C      | SRM212C      | SRM2<br>➔L274<br>         | K041 |
| SPMW322       | SPMW090308    |                                                                                                              |      | SRM216C      | SRM216C      |                                                                                                              |      |
| SPMW421       | SPMW120304    |                                                                                                              |      | SRM220C      | SRM220C      |                                                                                                              |      |
| SPMW422       | SPMW120308    |                                                                                                              |      |              |              |                                                                                                              |      |
| SPMX120408-JM | SPMX120408-JM | SPX<br>➔L180<br>            | K039 | SRM212E      | SRM212E      |                           | K041 |
|               |               |                                                                                                              |      | SRM216E      | SRM216E      |                                                                                                              |      |
|               |               |                             | K039 | SRM210C-M    | SRM210C-M    |                           | K041 |
| SPMX120408-WH | SPMX120408-WH |                                                                                                              |      | SRM212C-M    | SRM212C-M    |                                                                                                              |      |
|               |               |                                                                                                              |      | SRM216C-M    | SRM216C-M    |                                                                                                              |      |
|               |               |                                                                                                              |      | SRM220C-M    | SRM220C-M    |                                                                                                              |      |
| SRFT0375      | SRFT0375      | SRF<br>➔L262<br>            | K040 | SRM210E-M    | SRM210E-M    |                           | K041 |
| SRFT0500      | SRFT0500      |                                                                                                              |      | SRM212E-M    | SRM212E-M    |                                                                                                              |      |
| SRFT0625      | SRFT0625      |                                                                                                              |      | SRM216E-M    | SRM216E-M    |                                                                                                              |      |
| SRFT0750      | SRFT0750      |                                                                                                              |      | SRM220E-M    | SRM220E-M    |                                                                                                              |      |
| SRFT1000      | SRFT1000      |                                                                                                              |      |              |              |                                                                                                              |      |
| SRFT1250      | SRFT1250      |                                                                                                              |      |              |              |                                                                                                              |      |
| SRFT10        | SRFT10        | SRF(METRIC)<br>➔L262<br>   | K040 | SRM16C-M     | SRM16C-M     | SRM2(METRIC)<br>➔L274<br> | K041 |
| SRFT12        | SRFT12        |                                                                                                              |      | SRM20C-M     | SRM20C-M     |                                                                                                              |      |
| SRFT16        | SRFT16        |                                                                                                              |      | SRM25C-M     | SRM25C-M     |                                                                                                              |      |
| SRFT20        | SRFT20        |                                                                                                              |      | SRM30C-M     | SRM30C-M     |                                                                                                              |      |
| SRFT25        | SRFT25        |                                                                                                              |      | SRM32C-M     | SRM32C-M     |                         | K042 |
| SRFT30        | SRFT30        |                                                                                                              |      | SRM16E-M     | SRM16E-M     |                                                                                                              |      |
| SRFT32        | SRFT32        |                                                                                                              |      | SRM20E-M     | SRM20E-M     |                                                                                                              |      |
|               |               |                                                                                                              |      | SRM25E-M     | SRM25E-M     |                                                                                                              |      |
| SRG40C        | SRG40C        | SRM2 40/50<br>➔L286<br>   | K042 | SRM30E-M     | SRM30E-M     |                                                                                                              |      |
| SRG50C        | SRG50C        |                                                                                                              |      | SRM32E-M     | SRM32E-M     |                                                                                                              |      |
|               |               |                                                                                                              |      |              |              |                                                                                                              |      |
| SRG40E        | SRG40E        |                           | K042 |              |              |                                                                                                              |      |
| SRG50E        | SRG50E        |                                                                                                              |      |              |              |                                                                                                              |      |
|               |               |                                                                                                              |      |              |              |                                                                                                              |      |
| SRG16C        | SRG16C        | SRM2(METRIC)<br>➔L274<br> | K041 |              |              |                                                                                                              |      |
| SRG20C        | SRG20C        |                                                                                                              |      |              |              |                                                                                                              |      |
| SRG25C        | SRG25C        |                                                                                                              |      |              |              |                                                                                                              |      |
| SRG30C        | SRG30C        |                                                                                                              |      |              |              |                                                                                                              |      |
| SRG32C        | SRG32C        |                                                                                                              |      |              |              |                                                                                                              |      |
| SRG16E        | SRG16E        |                           | K041 |              |              |                                                                                                              |      |
| SRG20E        | SRG20E        |                                                                                                              |      |              |              |                                                                                                              |      |
| SRG25E        | SRG25E        |                                                                                                              |      |              |              |                                                                                                              |      |
| SRG30E        | SRG30E        |                                                                                                              |      |              |              |                                                                                                              |      |
| SRG32E        | SRG32E        |                                                                                                              |      |              |              |                                                                                                              |      |

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| SUFT10R05     | SUFT10R05       | SUF(METRIC)<br>↻L262 | K040 |
| SUFT10R10     | SUFT10R10       |                      |      |
| SUFT10R20     | SUFT10R20       |                      |      |
| SUFT12R05     | SUFT12R05       |                      |      |
| SUFT12R10     | SUFT12R10       |                      |      |
| SUFT12R20     | SUFT12R20       |                      |      |
| SUFT12R30     | SUFT12R30       |                      |      |
| SUFT16R05     | SUFT16R05       |                      |      |
| SUFT16R10     | SUFT16R10       |                      |      |
| SUFT16R15     | SUFT16R15       |                      |      |
| SUFT16R20     | SUFT16R20       |                      |      |
| SUFT16R30     | SUFT16R30       |                      |      |
| SUFT20R05     | SUFT20R05       |                      |      |
| SUFT20R10     | SUFT20R10       |                      |      |
| SUFT20R15     | SUFT20R15       |                      |      |
| SUFT20R20     | SUFT20R20       |                      |      |
| SUFT20R30     | SUFT20R30       |                      |      |
| SUFT25R05     | SUFT25R05       |                      |      |
| SUFT25R10     | SUFT25R10       |                      |      |
| SUFT25R20     | SUFT25R20       |                      |      |
| SUFT25R30     | SUFT25R30       |                      |      |
| SUFT30R05     | SUFT30R05       |                      |      |
| SUFT30R10     | SUFT30R10       |                      |      |
| SUFT30R20     | SUFT30R20       |                      |      |
| SUFT30R30     | SUFT30R30       |                      |      |
| SUFT32R05     | SUFT32R05       |                      |      |
| SUFT32R10     | SUFT32R10       |                      |      |
| SUFT32R20     | SUFT32R20       |                      |      |
| TECN32PEFR1W  | TECN1603PEFR1W  | NSE300               | K036 |
| TECN32PEER1W  | TECN1603PEER1W  |                      |      |
| TECN32PETR1W  | TECN1603PETR1W  |                      |      |
| TEEN32PEFR1   | TEEN1603PEFR1   | ↻L262                | K036 |
| TEEN32PEER1   | TEEN1603PEER1   |                      |      |
| TEEN32PETR1   | TEEN1603PETR1   |                      |      |
| TEEN32PESR1   | TEEN1603PESR1   |                      |      |
| TEER32PEER-JS | TEER1603PEER-JS | ↻L262                | K036 |
|               |                 |                      |      |
|               |                 |                      |      |
| TECN43PEFR1   | TECN2204PEFR1   | NSE400<br>SE400      | K036 |
| TECN43PEER1   | TECN2204PEER1   |                      |      |
| TECN43PETR1   | TECN2204PETR1   |                      |      |
| TEEN43PEFR1   | TEEN2204PEFR1   |                      |      |
| TEEN43PEER1   | TEEN2204PEER1   |                      |      |
| TEEN43PETR1   | TEEN2204PETR1   |                      |      |
| TEEN43PESR1   | TEEN2204PESR1   |                      |      |
| TEKN43PEER1   | TEKN2204PEER1   |                      |      |
| TEKN43PESR1   | TEKN2204PESR1   |                      |      |
| TEKN43PETR1   | TEKN2204PETR1   |                      |      |
| TEKN43PETR    | TEKN2204PETR    |                      |      |

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| TEER43PEER-JS  | TEER2204PEER-JS | NSE400<br>SE400                 | K036 |
|                |                 |                                 |      |
| TPEW1303ZPER2  | TPEW1303ZPER2   | PMF<br>↻L290                    | K036 |
|                |                 |                                 |      |
| TPEW1303ZPTR2  | TPEW1303ZPTR2   | ↻L290                           | K052 |
|                |                 |                                 |      |
| TPKN32PPR      | TPKN1603PPR     | Corner Angle 0°<br>11° Positive | K048 |
| TPKN43PDR      | TPKN2204PDR     |                                 |      |
| TPMN321        | TPMN160304      | 11° Positive                    | K049 |
| TPMN322        | TPMN160308      |                                 |      |
| TPMN323        | TPMN160312      |                                 |      |
| TPMN431        | TPMN220404      |                                 |      |
| TPMN432        | TPMN220408      |                                 |      |
| TPMN433        | TPMN220412      |                                 |      |
| WEC42EFER5C    | WEC42EFER5C     | SE415                           | K037 |
| WEC42EFTR5C    | WEC42EFTR5C     |                                 |      |
| WEC42AFTR5C    | WEC42AFTR5C     | SE445                           | K038 |
|                |                 |                                 |      |
| WEC42AFFR5C    | WEC42AFFR5C     | ↻L290                           | K052 |
| WEC42AFTR5C    | WEC42AFTR5C     |                                 |      |
| WEC53AFER5C    | WEC53AFER5C     | SE545                           | K038 |
| WEC53AFTR5C    | WEC53AFTR5C     |                                 |      |
| WEEW13T3AGER8C | WEEW13T3AGER8C  | ASX445<br>↻L030                 | K029 |
| WEEW13T3AGTR8C | WEEW13T3AGTR8C  |                                 |      |
| WFC42ZFER2     | WFC42ZFER2      | BF407                           | K052 |
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| WNEU1305ZEN4C-M  | WNEU1305ZEN4C-M  | AHX440S<br>ⓈL038                                                                    | K024                                                                                | XDGT1550PDR-GL04  | XDGT1550PDR-GL04 | BXD4000<br>ⓈL176                                                                      | K034 |  |
|                  |                  |    |                                                                                     | XDGT1550PDR-GL08  | XDGT1550PDR-GL08 |    |      |  |
| WNEU2006ZEN7C-WK | WNEU2006ZEN7C-WK | AHX640S<br>ⓈL048<br>AHX640W<br>ⓈL060                                                | K025                                                                                | XDGX175004PDR-GL  | XDGX175004PDR-GL | AXD4000<br>ⓈL156                                                                      | K029 |  |
|                  |                  |    |                                                                                     | XDGX175008PDR-GL  | XDGX175008PDR-GL |    |      |  |
|                  |                  |                                                                                     | XDGX175012PDR-GL                                                                    | XDGX175012PDR-GL  |                  |                                                                                       |      |  |
|                  |                  |                                                                                     | XDGX175016PDR-GL                                                                    | XDGX175016PDR-GL  |                  |                                                                                       |      |  |
|                  |                  |                                                                                     | XDGX175020PDR-GL                                                                    | XDGX175020PDR-GL  |                  |                                                                                       |      |  |
|                  |                  |                                                                                     | XDGX175024PDR-GL                                                                    | XDGX175024PDR-GL  |                  |                                                                                       |      |  |
|                  |                  |                                                                                     | XDGX175030PDR-GL                                                                    | XDGX175030PDR-GL  |                  |                                                                                       |      |  |
| WNEU2007ZEN7C-M  | WNEU2007ZEN7C-M  | AHX640S<br>ⓈL048                                                                    | K025                                                                                | XDGX175032PDR-GL  | XDGX175032PDR-GL |    | K030 |  |
| WNEU2007ZEN7C-WP | WNEU2007ZEN7C-WP |    |                                                                                     | XDGX175040PDR-GL  | XDGX175040PDR-GL |                                                                                       |      |  |
|                  |                  |                                                                                     | XDGX175050PDR-GL                                                                    | XDGX175050PDR-GL  |                  |                                                                                       |      |  |
|                  |                  |                                                                                     |                                                                                     |                   |                  |                                                                                       |      |  |
|                  |                  |                                                                                     |                                                                                     |                   |                  |                                                                                       |      |  |
|                  |                  |                                                                                     |                                                                                     |                   |                  |                                                                                       |      |  |
| WOEW12T308PEER8C | WOEW12T308PEER8C | ASX400<br>ⓈL082                                                                     | K028                                                                                | XDGX175004PDR-GM  | XDGX175004PDR-GM |  | K030 |  |
| WOEW12T308PETR8C | WOEW12T308PETR8C |    |                                                                                     | XDGX175008PDR-GM  | XDGX175008PDR-GM |                                                                                       |      |  |
|                  |                  |                                                                                     | XDGX175012PDR-GM                                                                    | XDGX175012PDR-GM  |                  |                                                                                       |      |  |
|                  |                  |                                                                                     | XDGX175016PDR-GM                                                                    | XDGX175016PDR-GM  |                  |                                                                                       |      |  |
|                  |                  |                                                                                     | XDGX175020PDR-GM                                                                    | XDGX175020PDR-GM  |                  |                                                                                       |      |  |
|                  |                  |                                                                                     | XDGX175024PDR-GM                                                                    | XDGX175024PDR-GM  |                  |                                                                                       |      |  |
| WOEX1206PER5C    | WOEX1206PER5C    | VOX400<br>ⓈL076                                                                     | K046                                                                                | XDGX175030PDR-GM  | XDGX175030PDR-GM |  | K030 |  |
|                  |                  |    |                                                                                     | XDGX175032PDR-GM  | XDGX175032PDR-GM |                                                                                       |      |  |
|                  |                  |                                                                                     | XDGX175040PDR-GM                                                                    | XDGX175040PDR-GM  |                  |                                                                                       |      |  |
|                  |                  |                                                                                     | XDGX175050PDR-GM                                                                    | XDGX175050PDR-GM  |                  |                                                                                       |      |  |
|                  |                  |                                                                                     |                                                                                     |                   |                  |                                                                                       |      |  |
|                  |                  |                                                                                     |                                                                                     |                   |                  |                                                                                       |      |  |
| WPC42EEER10C     | WPC42EEER10C     | FBP415                                                                              | K035                                                                                | XDGX175004PDR-GM  | XDGX175004PDR-GM |  | K030 |  |
| WPC42EEEL10C     | WPC42EEEL10C     |  |                                                                                     | XDGX175008PDR-GM  | XDGX175008PDR-GM |                                                                                       |      |  |
|                  |                  |                                                                                     | XDGX175012PDR-GM                                                                    | XDGX175012PDR-GM  |                  |                                                                                       |      |  |
|                  |                  |                                                                                     | XDGX175016PDR-GM                                                                    | XDGX175016PDR-GM  |                  |                                                                                       |      |  |
|                  |                  |                                                                                     | XDGX175020PDR-GM                                                                    | XDGX175020PDR-GM  |                  |                                                                                       |      |  |
|                  |                  |                                                                                     | XDGX175024PDR-GM                                                                    | XDGX175024PDR-GM  |                  |                                                                                       |      |  |
| XDGT1550PDR-G04  | XDGT1550PDR-G04  | BXD4000<br>ⓈL176                                                                    | K034                                                                                | XDGX175030PDR-GM  | XDGX175030PDR-GM |  | K030 |  |
| XDGT1550PDR-G08  | XDGT1550PDR-G08  |  |                                                                                     | XDGX175032PDR-GM  | XDGX175032PDR-GM |                                                                                       |      |  |
| XDGT1550PDR-G12  | XDGT1550PDR-G12  |                                                                                     | XDGX175040PDR-GM                                                                    | XDGX175040PDR-GM  |                  |                                                                                       |      |  |
| XDGT1550PDR-G16  | XDGT1550PDR-G16  |                                                                                     | XDGX175050PDR-GM                                                                    | XDGX175050PDR-GM  |                  |                                                                                       |      |  |
| XDGT1550PDR-G20  | XDGT1550PDR-G20  |                                                                                     |  | XDGX227008PDR-GL  | XDGX227008PDR-GL |                                                                                       |      |  |
| XDGT1550PDR-G30  | XDGT1550PDR-G30  |                                                                                     |                                                                                     | XDGX227016PDR-GL  | XDGX227016PDR-GL |                                                                                       |      |  |
| XDGT1550PDR-G32  | XDGT1550PDR-G32  |                                                                                     |                                                                                     | XDGX227020PDR-GL  | XDGX227020PDR-GL |                                                                                       |      |  |
| XDGT1550PDR-G40  | XDGT1550PDR-G40  | XDGX227024PDR-GL                                                                    |                                                                                     | XDGX227024PDR-GL  |                  |                                                                                       |      |  |
| XDGT1550PDR-G50  | XDGT1550PDR-G50  | XDGX227030PDR-GL                                                                    |                                                                                     | XDGX227030PDR-GL  |                  |                                                                                       |      |  |
| XDGT1550PDR-G04  | XDGT1550PDR-G04  | XDGX227032PDR-GL                                                                    |                                                                                     | XDGX227032PDR-GL  |                  |                                                                                       |      |  |
| XDGT1550PDR-G08  | XDGT1550PDR-G08  |                                                                                     | XDGX227040PDR-GL                                                                    | XDGX227040PDR-GL  |                  |                                                                                       |      |  |
| XDGT1550PDR-G12  | XDGT1550PDR-G12  |                                                                                     | XDGX227050PDR-GL                                                                    | XDGX227050PDR-GL  |                  |                                                                                       |      |  |
| XDGT1550PDR-G16  | XDGT1550PDR-G16  |                                                                                     | XDGX227008PDR-GLA                                                                   | XDGX227008PDR-GLA |                  |                                                                                       |      |  |
| XDGT1550PDR-G20  | XDGT1550PDR-G20  |                                                                                     | XDGX227016PDR-GLA                                                                   | XDGX227016PDR-GLA |                  |                                                                                       |      |  |
| XDGT1550PDR-G30  | XDGT1550PDR-G30  |                                                                                     | XDGX227020PDR-GLA                                                                   | XDGX227020PDR-GLA |                  |                                                                                       |      |  |
| XDGT1550PDR-G32  | XDGT1550PDR-G32  |                                                                                     | XDGX227024PDR-GLA                                                                   | XDGX227024PDR-GLA |                  |                                                                                       |      |  |
| XDGT1550PDR-G40  | XDGT1550PDR-G40  |                                                                                     | XDGX227030PDR-GLA                                                                   | XDGX227030PDR-GLA |                  |                                                                                       |      |  |
| XDGT1550PDR-G50  | XDGT1550PDR-G50  |                                                                                     | XDGX227032PDR-GLA                                                                   | XDGX227032PDR-GLA |                  |                                                                                       |      |  |
|                  |                  |                                                                                     | XDGX227040PDR-GLA                                                                   | XDGX227040PDR-GLA |                  |                                                                                       |      |  |
|                  |                  |                                                                                     | XDGX227050PDR-GLA                                                                   | XDGX227050PDR-GLA |                  |                                                                                       |      |  |

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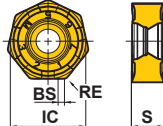
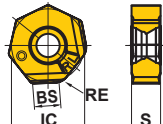
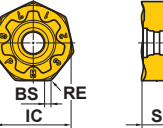
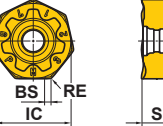
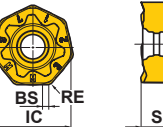
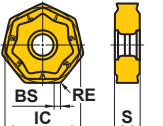
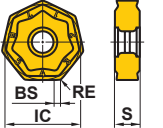
ROTATING TOOL INSERTS

| Order Number            | (ISO) Number     | Cutter Type                                                                                               | Page | Order Number           | (ISO) Number    | Cutter Type                                                                                                | Page |
|-------------------------|------------------|-----------------------------------------------------------------------------------------------------------|------|------------------------|-----------------|------------------------------------------------------------------------------------------------------------|------|
| <b>XNMU160708R-MS</b>   | XNMU160708R-MS   | <b>VFX5</b><br>⌀L186<br> | K045 | <b>ZCMX083508ERA</b>   | ZCMX083508ER-A  | <b>LER</b><br>⌀L194<br> | K035 |
| <b>XNMU160712R-MS</b>   | XNMU160712R-MS   |                                                                                                           |      | <b>ZCMX09T308ERA</b>   | ZCMX09T308ER-A  |                                                                                                            |      |
| <b>XNMU160716R-MS</b>   | XNMU160716R-MS   |                                                                                                           |      |                        |                 |                                                                                                            |      |
| <b>XNMU160724R-MS</b>   | XNMU160724R-MS   |                                                                                                           |      |                        |                 |                                                                                                            |      |
| <b>XNMU160732R-MS</b>   | XNMU160732R-MS   |                                                                                                           |      |                        |                 |                                                                                                            |      |
| <b>XNMU160740R-MS</b>   | XNMU160740R-MS   |                                                                                                           |      |                        |                 |                                                                                                            |      |
| <b>XNMU160708R-HS</b>   | XNMU160708R-HS   |                          | K045 | <b>ZCMX09T308ERB</b>   | ZCMX09T308ER-B  |                         | K035 |
|                         |                  |                                                                                                           |      |                        |                 |                                                                                                            |      |
| <b>XNMU160708R-LS</b>   | XNMU160708R-LS   |                          | K045 | <b>TAWC12T301-45GM</b> | TAWC12T301-45GM | <b>TAW</b><br>          | K053 |
|                         |                  |                                                                                                           |      |                        |                 |                                                                                                            |      |
| <b>XNMU190912R-MS</b>   | XNMU190912R-MS   | <b>VFX6</b><br>⌀L190<br> | K045 |                        |                 |                                                                                                            |      |
| <b>XNMU190916R-MS</b>   | XNMU190916R-MS   |                                                                                                           |      |                        |                 |                                                                                                            |      |
| <b>XNMU190924R-MS</b>   | XNMU190924R-MS   |                                                                                                           |      |                        |                 |                                                                                                            |      |
| <b>XNMU190932R-MS</b>   | XNMU190932R-MS   |                                                                                                           |      |                        |                 |                                                                                                            |      |
| <b>XNMU190940R-MS</b>   | XNMU190940R-MS   |                                                                                                           |      |                        |                 |                                                                                                            |      |
| <b>XNMU190950R-MS</b>   | XNMU190950R-MS   |                                                                                                           |      |                        |                 |                                                                                                            |      |
| <b>XNMU190912R-HS</b>   | XNMU190912R-HS   |                         | K045 |                        |                 |                                                                                                            |      |
|                         |                  |                                                                                                           |      |                        |                 |                                                                                                            |      |
| <b>XNMU190912R-LS</b>   | XNMU190912R-LS   |                        | K045 |                        |                 |                                                                                                            |      |
|                         |                  |                                                                                                           |      |                        |                 |                                                                                                            |      |
| <b>XPGT13T3PDER-G1</b>  | XPGT13T3PDER-G1  | <b>BAP3500</b><br>     | K032 |                        |                 |                                                                                                            |      |
| <b>XPGT13T3PDER-G2</b>  | XPGT13T3PDER-G2  |                                                                                                           |      |                        |                 |                                                                                                            |      |
| <b>XPGT13T3PDER-G6</b>  | XPGT13T3PDER-G6  |                                                                                                           |      |                        |                 |                                                                                                            |      |
| <b>XPGT13T3PDER-G75</b> | XPGT13T3PDER-G75 |                                                                                                           |      |                        |                 |                                                                                                            |      |
| <b>XPGT13T3PDER-G8</b>  | XPGT13T3PDER-G8  |                        | K032 |                        |                 |                                                                                                            |      |
| <b>XPGT13T3PDFR-G1</b>  | XPGT13T3PDFR-G1  |                                                                                                           |      |                        |                 |                                                                                                            |      |
| <b>XPGT13T3PDFR-G2</b>  | XPGT13T3PDFR-G2  |                                                                                                           |      |                        |                 |                                                                                                            |      |
| <b>XPGT13T3PDFR-G6</b>  | XPGT13T3PDFR-G6  |                                                                                                           |      |                        |                 |                                                                                                            |      |
| <b>XPGT13T3PDFR-G75</b> | XPGT13T3PDFR-G75 |                        | K032 |                        |                 |                                                                                                            |      |
| <b>XPGT13T3PDFR-G8</b>  | XPGT13T3PDFR-G8  |                                                                                                           |      |                        |                 |                                                                                                            |      |
| <b>XPMT13T3PDER-M1</b>  | XPMT13T3PDER-M1  |                                                                                                           |      |                        |                 |                                                                                                            |      |
| <b>XPMT13T3PDER-M2</b>  | XPMT13T3PDER-M2  |                                                                                                           |      |                        |                 |                                                                                                            |      |
| <b>XPMT13T3PDER-M6</b>  | XPMT13T3PDER-M6  |                        | K032 |                        |                 |                                                                                                            |      |
| <b>XPMT13T3PDER-M75</b> | XPMT13T3PDER-M75 |                                                                                                           |      |                        |                 |                                                                                                            |      |
| <b>XPMT13T3PDER-M8</b>  | XPMT13T3PDER-M8  |                                                                                                           |      |                        |                 |                                                                                                            |      |

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ROTATING TOOL INSERTS

# ROTATING INSERTS

| Work Material                                                                                                                                                                                                                                                                                                           | P                       | Steel                                |       |        | ●      |        | ✱      |        |        |        | ●      |        | ●                 |        | ●    |      | <b>Cutting Conditions (Guide) :</b><br>● : Stable Cutting<br>● : General Cutting<br>✱ : Unstable Cutting<br><br><b>Honing :</b><br>E : Round |      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|--------------------------------------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------------------|--------|------|------|----------------------------------------------------------------------------------------------------------------------------------------------|------|
|                                                                                                                                                                                                                                                                                                                         | M                       | Stainless Steel                      |       |        | ●      |        |        |        |        |        |        |        |                   |        |      |      |                                                                                                                                              |      |
|                                                                                                                                                                                                                                                                                                                         | K                       | Cast Iron                            |       |        | ●      |        |        |        |        |        |        |        |                   |        |      |      |                                                                                                                                              |      |
|                                                                                                                                                                                                                                                                                                                         | N                       | Non-Ferrous Metal                    |       |        |        |        |        |        |        |        |        |        |                   |        |      |      |                                                                                                                                              |      |
|                                                                                                                                                                                                                                                                                                                         | S                       | Heat-resistant Alloy, Titanium Alloy |       |        |        |        |        |        |        |        |        |        |                   |        |      |      |                                                                                                                                              |      |
|                                                                                                                                                                                                                                                                                                                         | H                       | Hardened Steel                       |       |        |        |        |        |        |        |        |        |        |                   |        |      |      |                                                                                                                                              |      |
| Cutter Type<br>Insert Geometry                                                                                                                                                                                                                                                                                          | Order Number            | (ISO) Number                         | Class | Honing | Coated |        |        |        |        |        |        |        | Dimensions (inch) |        |      |      |                                                                                                                                              |      |
|                                                                                                                                                                                                                                                                                                                         |                         |                                      |       |        | MC5020 | MP6120 | MP6130 | MP7130 | MP7140 | MP9120 | MP9130 | VP15TF | VP20RT            | MP7030 | IC   | S    | BS                                                                                                                                           | RE   |
| <b>AHX440S</b>  <b>L038</b><br><b>AHX475S</b>  <b>L044</b><br>       | <b>NNMU130508ZER-L</b>  | NNMU130508ZER-L                      | M     | E      | ●      | ●      | ●      | ●      | ●      |        |        | ★      |                   |        | .528 | .227 | .039                                                                                                                                         | .031 |
|                                                                                                                                                                                                                                                                                                                         | <b>NNMU130508ZEN-M</b>  | NNMU130508ZEN-M                      | M     | E      | ●      | ●      | ●      | ●      | ●      |        |        | ★      |                   |        | .528 | .219 | .039                                                                                                                                         | .031 |
|                                                                                                                                                                                                                                                                                                                         | <b>NNMU130532ZEN-M</b>  | NNMU130532ZEN-M                      | M     | E      | ●      | ●      | ●      | ●      | ●      |        |        | ★      |                   |        | .528 | .219 | —                                                                                                                                            | .126 |
|                                                                                                                                                                                                                                                                                                                         | <b>NNMU130532ZEN-R</b>  | NNMU130532ZEN-R                      | M     | E      | ●      | ●      | ●      | ●      | ●      |        |        | ★      |                   |        | .528 | .215 | —                                                                                                                                            | .126 |
|                                                                                                                                                                                                                                                                                                                         |                         |                                      |       |        |        |        |        |        |        |        |        |        |                   |        |      |      |                                                                                                                                              |      |
| <b>AHX440S</b>  <b>L038</b><br>                                                                                                                       | <b>WNEU1305ZEN4C-M</b>  | WNEU1305ZEN4C-M                      | E     | E      | ●      | ●      |        |        |        |        |        | ●      |                   |        | .528 | .201 | .157                                                                                                                                         | .106 |
|                                                                                                                                                                                                                                                                                                                         |                         |                                      |       |        |        |        |        |        |        |        |        |        |                   |        |      |      |                                                                                                                                              |      |
| <b>AHX640S</b>  <b>L048</b><br>                                                                                                                     | <b>NNMU200708ZEN-M</b>  | NNMU200708ZEN-M                      | M     | E      |        | ●      | ●      |        |        |        |        |        |                   |        | .787 | .315 | .039                                                                                                                                         | .031 |
|                                                                                                                                                                                                                                                                                                                         |                         |                                      |       |        |        |        |        |        |        |        |        |        |                   |        |      |      |                                                                                                                                              |      |
| <b>AHX640S</b>  <b>L048</b><br>                                                                                                                   | <b>NNMU200708ZEN-MP</b> | NNMU200708ZEN-MP                     | M     | E      |        |        |        |        |        |        |        | ●      |                   |        | .787 | .315 | .039                                                                                                                                         | .031 |
|                                                                                                                                                                                                                                                                                                                         |                         |                                      |       |        |        |        |        |        |        |        |        |        |                   |        |      |      |                                                                                                                                              |      |
| <b>AHX640S</b>  <b>L048</b><br>                                                                                                                   | <b>NNMU200712ZER-MM</b> | NNMU200712ZER-MM                     | M     | E      |        |        |        |        |        |        |        |        | ●                 |        | .787 | .315 | .039                                                                                                                                         | .047 |
|                                                                                                                                                                                                                                                                                                                         |                         |                                      |       |        |        |        |        |        |        |        |        |        |                   |        |      |      |                                                                                                                                              |      |
| <b>AHX640S</b>  <b>L048</b><br><b>AHX640W</b>  <b>L060</b><br> | <b>NNMU200608ZEN-HK</b> | NNMU200608ZEN-HK                     | M     | E      | ●      |        |        |        |        |        |        | ●      | ●                 |        | .787 | .258 | .039                                                                                                                                         | .031 |
|                                                                                                                                                                                                                                                                                                                         |                         |                                      |       |        |        |        |        |        |        |        |        |        |                   |        |      |      |                                                                                                                                              |      |
| <b>AHX640S</b>  <b>L048</b><br><b>AHX640W</b>  <b>L060</b><br> | <b>NNMU200608ZEN-MK</b> | NNMU200608ZEN-MK                     | M     | E      | ●      |        |        |        |        |        |        | ●      | ●                 |        | .787 | .258 | .039                                                                                                                                         | .031 |
|                                                                                                                                                                                                                                                                                                                         |                         |                                      |       |        |        |        |        |        |        |        |        |        |                   |        |      |      |                                                                                                                                              |      |

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ROTATING TOOL INSERTS

## ROTATING TOOL INSERTS

**K025**

# ROTATING INSERTS

| Work Material                                                                                                                        | P                 | Steel                                | Cutter Type | Order Number | (ISO) Number | Class | Honing | Coated |        |        |        |        |        |        |        |        |        | Carbide | Dimensions (inch) |      |      |      |      |
|--------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------------------------------|-------------|--------------|--------------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|-------------------|------|------|------|------|
|                                                                                                                                      | M                 | Stainless Steel                      |             |              |              |       |        | MC5020 | MP6120 | MP6130 | MP7130 | MP7140 | MP9120 | MP9130 | VP15TF | VP20RT | VP30RT |         | L                 | W1   | S    | BS   | RE   |
|                                                                                                                                      | K                 | Cast Iron                            |             |              |              |       |        |        |        |        |        |        |        |        |        |        |        |         |                   |      |      |      |      |
|                                                                                                                                      | N                 | Non-Ferrous Metal                    |             |              |              |       |        |        |        |        |        |        |        |        |        |        |        |         |                   |      |      |      |      |
|                                                                                                                                      | S                 | Heat-resistant Alloy, Titanium Alloy |             |              |              |       |        |        |        |        |        |        |        |        |        |        |        |         |                   |      |      |      |      |
|                                                                                                                                      | H                 | Hardened Steel                       |             |              |              |       |        |        |        |        |        |        |        |        |        |        |        |         |                   |      |      |      |      |
| Cutting Conditions (Guide) :<br>● : Stable Cutting<br>● : General Cutting<br>✱ : Unstable Cutting<br>Honing :<br>E : Round F : Sharp |                   |                                      |             |              |              |       |        |        |        |        |        |        |        |        |        |        |        |         |                   |      |      |      |      |
| APX3000 ➡ L096<br>                                                                                                                   |                   |                                      |             |              |              |       |        |        |        |        |        |        |        |        |        |        |        |         |                   |      |      |      |      |
|                                                                                                                                      | AOGT123602PEFR-GM | AOGT123602PEFR-GM                    | G           | F            |              |       |        |        |        |        |        |        |        |        |        |        |        | ●       | .472              | .260 | .142 | .071 | .008 |
|                                                                                                                                      | AOGT123604PEFR-GM | AOGT123604PEFR-GM                    | G           | F            |              |       |        |        |        |        |        |        |        |        |        |        |        | ●       | .472              | .260 | .142 | .063 | .016 |
|                                                                                                                                      | AOGT123608PEFR-GM | AOGT123608PEFR-GM                    | G           | F            |              |       |        |        |        |        |        |        |        |        |        |        |        | ●       | .472              | .260 | .142 | .047 | .031 |
| APX3000 ➡ L096<br>                                                                                                                   |                   |                                      |             |              |              |       |        |        |        |        |        |        |        |        |        |        |        |         |                   |      |      |      |      |
|                                                                                                                                      | AOMT123604PEER-H  | AOMT123604PEER-H                     | M           | E            |              |       |        | ●      | ●      | ●      |        | ●      | ●      | ●      |        |        |        |         | .472              | .260 | .142 | .063 | .016 |
|                                                                                                                                      | AOMT123608PEER-H  | AOMT123608PEER-H                     | M           | E            |              |       |        | ●      | ●      | ●      |        | ●      | ●      | ●      |        |        |        |         | .472              | .260 | .142 | .047 | .031 |
|                                                                                                                                      | AOMT123616PEER-H  | AOMT123616PEER-H                     | M           | E            |              |       |        | ●      | ●      | ●      |        | ●      | ●      | ●      |        |        |        |         | .472              | .260 | .142 | .016 | .063 |
| APX3000 ➡ L096<br>                                                                                                                   |                   |                                      |             |              |              |       |        |        |        |        |        |        |        |        |        |        |        |         |                   |      |      |      |      |
|                                                                                                                                      | AOMT123602PEER-M  | AOMT123602PEER-M                     | M           | E            |              |       |        | ●      | ●      | ●      |        | ●      | ●      | ●      |        |        |        |         | .472              | .260 | .142 | .071 | .008 |
|                                                                                                                                      | AOMT123604PEER-M  | AOMT123604PEER-M                     | M           | E            |              |       |        | ●      | ●      | ●      |        | ●      | ●      | ●      |        |        |        |         | .472              | .260 | .142 | .063 | .016 |
|                                                                                                                                      | AOMT123608PEER-M  | AOMT123608PEER-M                     | M           | E            |              |       |        | ●      | ●      | ●      |        | ●      | ●      | ●      |        |        |        |         | .472              | .260 | .142 | .047 | .031 |
|                                                                                                                                      | AOMT123610PEER-M  | AOMT123610PEER-M                     | M           | E            |              |       |        | ●      | ●      | ●      |        | ●      | ●      | ●      | ★      | ★      |        |         | .472              | .260 | .142 | .039 | .039 |
|                                                                                                                                      | AOMT123612PEER-M  | AOMT123612PEER-M                     | M           | E            |              |       |        | ●      | ●      | ●      |        | ●      | ●      | ●      |        |        |        |         | .472              | .260 | .142 | .031 | .047 |
|                                                                                                                                      | AOMT123616PEER-M  | AOMT123616PEER-M                     | M           | E            |              |       |        | ●      | ●      | ●      |        | ●      | ●      | ●      |        |        |        |         | .472              | .260 | .142 | .016 | .063 |
|                                                                                                                                      | AOMT123620PEER-M  | AOMT123620PEER-M                     | M           | E            |              |       |        | ●      | ●      | ●      |        | ●      | ●      | ●      |        |        |        |         | .472              | .260 | .142 | .016 | .079 |
|                                                                                                                                      | AOMT123624PEER-M  | AOMT123624PEER-M                     | M           | E            |              |       |        | ●      | ●      | ●      |        | ●      | ●      | ●      |        |        |        |         | .472              | .260 | .142 | .016 | .094 |
|                                                                                                                                      | AOMT123630PEER-M  | AOMT123630PEER-M                     | M           | E            |              |       |        | ●      | ●      | ●      |        | ●      | ●      | ●      |        |        |        |         | .472              | .260 | .142 | .016 | .118 |
|                                                                                                                                      | AOMT123632PEER-M  | AOMT123632PEER-M                     | M           | E            |              |       |        | ●      | ●      | ●      |        | ●      | ●      | ●      |        |        |        |         | .472              | .260 | .142 | .016 | .126 |
| APX4000 ➡ L110<br>                                                                                                                   |                   |                                      |             |              |              |       |        |        |        |        |        |        |        |        |        |        |        |         |                   |      |      |      |      |
|                                                                                                                                      | AOMT184804PEER-H  | AOMT184804PEER-H                     | M           | E            |              |       |        | ●      | ●      | ●      |        | ●      | ●      | ●      |        |        |        |         | .709              | .354 | .189 | .071 | .016 |
|                                                                                                                                      | AOMT184808PEER-H  | AOMT184808PEER-H                     | M           | E            |              |       |        | ●      | ●      | ●      |        | ●      | ●      | ●      |        |        |        |         | .709              | .354 | .189 | .055 | .031 |
|                                                                                                                                      | AOMT184816PEER-H  | AOMT184816PEER-H                     | M           | E            |              |       |        | ●      | ●      | ●      |        | ●      | ●      | ●      |        |        |        |         | .709              | .354 | .189 | .016 | .063 |
|                                                                                                                                      | AOMT184832PEER-H  | AOMT184832PEER-H                     | M           | E            |              |       |        |        | ●      | ●      |        |        |        |        | ●      |        |        |         | .709              | .354 | .189 | .016 | .126 |
|                                                                                                                                      | AOMT184840PEER-H  | AOMT184840PEER-H                     | M           | E            |              |       |        |        | ●      | ●      |        |        |        |        | ●      |        |        |         | .709              | .354 | .189 | .016 | .157 |
|                                                                                                                                      | AOMT184850PEER-H  | AOMT184850PEER-H                     | M           | E            |              |       |        |        | ●      | ●      |        |        |        |        | ●      |        |        |         | .709              | .354 | .189 | —    | .197 |
|                                                                                                                                      | AOMT184864PEER-H  | AOMT184864PEER-H                     | M           | E            |              |       |        |        | ●      | ●      |        |        |        |        | ●      |        |        |         | .709              | .354 | .189 | —    | .250 |
| APX4000 ➡ L110<br>                                                                                                                   |                   |                                      |             |              |              |       |        |        |        |        |        |        |        |        |        |        |        |         |                   |      |      |      |      |
|                                                                                                                                      | AOMT184804PEER-M  | AOMT184804PEER-M                     | M           | E            |              |       |        | ●      | ●      | ●      |        | ●      | ●      | ●      |        |        |        |         | .709              | .354 | .189 | .071 | .016 |
|                                                                                                                                      | AOMT184808PEER-M  | AOMT184808PEER-M                     | M           | E            |              |       |        | ●      | ●      | ●      |        | ●      | ●      | ●      |        |        |        |         | .709              | .354 | .189 | .055 | .031 |
|                                                                                                                                      | AOMT184810PEER-M  | AOMT184810PEER-M                     | M           | E            |              |       |        | ●      |        |        |        | ●      | ●      | ★      |        |        |        |         | .709              | .354 | .189 | .039 | .039 |
|                                                                                                                                      | AOMT184812PEER-M  | AOMT184812PEER-M                     | M           | E            |              |       |        | ●      |        |        |        | ●      | ●      | ●      |        |        |        |         | .709              | .354 | .189 | .031 | .047 |
|                                                                                                                                      | AOMT184816PEER-M  | AOMT184816PEER-M                     | M           | E            |              |       |        | ●      | ●      | ●      |        | ●      | ●      | ●      |        |        |        |         | .709              | .354 | .189 | .016 | .063 |
|                                                                                                                                      | AOMT184820PEER-M  | AOMT184820PEER-M                     | M           | E            |              |       |        | ●      |        |        |        | ●      | ●      | ★      |        |        |        |         | .709              | .354 | .189 | .016 | .079 |

K

ROTATING TOOL INSERTS

## ROTATING TOOL INSERTS

**K027**

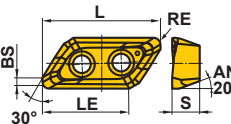
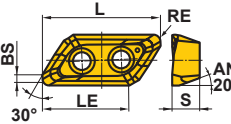
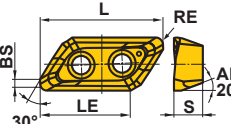
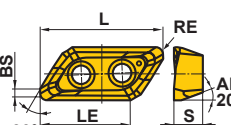
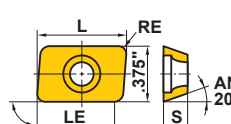
# ROTATING INSERTS

## ROTATING TOOL INSERTS

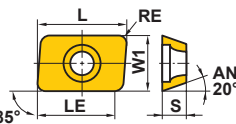
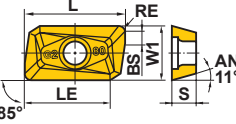
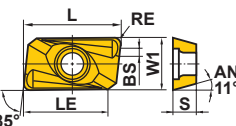
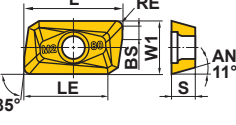
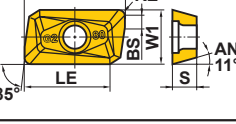
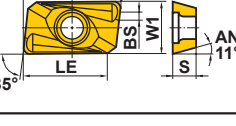
**K028** ● : USA Stock ★ : Stocked in Japan <10 inserts in one case>

K

# ROTATING INSERTS

| Work Material                                                                                      | P                  | Steel              | M     | Stainless Steel | K      | Cast Iron | N      | Non-Ferrous Metal | S      | Heat-resistant Alloy, Titanium Alloy | H       | Hardened Steel       | Cutting Conditions (Guide) : |       |      |   |       |      |      |      |      |  |  |  |  |
|----------------------------------------------------------------------------------------------------|--------------------|--------------------|-------|-----------------|--------|-----------|--------|-------------------|--------|--------------------------------------|---------|----------------------|------------------------------|-------|------|---|-------|------|------|------|------|--|--|--|--|
|                                                                                                    |                    |                    |       |                 |        |           |        |                   |        |                                      |         | ● : Stable Cutting   |                              |       |      |   |       |      |      |      |      |  |  |  |  |
|                                                                                                    |                    |                    |       |                 |        |           |        |                   |        |                                      |         | ● : General Cutting  |                              |       |      |   |       |      |      |      |      |  |  |  |  |
|                                                                                                    |                    |                    |       |                 |        |           |        |                   |        |                                      |         | ✱ : Unstable Cutting |                              |       |      |   |       |      |      |      |      |  |  |  |  |
|                                                                                                    |                    |                    |       |                 |        |           |        |                   |        |                                      |         | Honing :             |                              |       |      |   |       |      |      |      |      |  |  |  |  |
|                                                                                                    |                    |                    |       |                 |        |           |        |                   |        |                                      |         | E : Round F : Sharp  |                              |       |      |   |       |      |      |      |      |  |  |  |  |
| Cutter Type<br>Insert Geometry                                                                     | Order Number       | (ISO) Number       | Class | Honing          | Coated |           |        |                   | Cermel |                                      | Carbide |                      | Dimensions (inch)            |       |      |   |       |      |      |      |      |  |  |  |  |
|                                                                                                    |                    |                    |       |                 | F7030  | MP6120    | MP9120 | VP15TF            | LC15TF | UP20M                                | NX2525  | NX4545               | UT120T                       | HT110 | TF15 | L | LE    | S    | BS   | RE   |      |  |  |  |  |
| <b>AXD4000</b>    | XDGX175004PDER-GM  | XDGX175004PDER-GM  | G     | E               | ●      | ●         |        |                   |        |                                      |         |                      |                              |       |      |   | .906  | .669 | .197 | .067 | .016 |  |  |  |  |
|                                                                                                    | XDGX175008PDER-GM  | XDGX175008PDER-GM  | G     | E               | ●      | ●         |        |                   |        |                                      |         |                      |                              |       |      |   | .906  | .669 | .197 | .047 | .031 |  |  |  |  |
|                                                                                                    | XDGX175012PDER-GM  | XDGX175012PDER-GM  | G     | E               | ●      | ●         |        |                   |        |                                      |         |                      |                              |       |      |   | .906  | .669 | .197 | .035 | .047 |  |  |  |  |
|                                                                                                    | XDGX175016PDER-GM  | XDGX175016PDER-GM  | G     | E               | ●      | ●         |        |                   |        |                                      |         |                      |                              |       |      |   | .866  | .626 | .197 | .054 | .063 |  |  |  |  |
|                                                                                                    | XDGX175020PDER-GM  | XDGX175020PDER-GM  | G     | E               | ●      | ●         |        |                   |        |                                      |         |                      |                              |       |      |   | .866  | .626 | .197 | .033 | .079 |  |  |  |  |
|                                                                                                    | XDGX175024PDER-GM  | XDGX175024PDER-GM  | G     | E               | ●      | ●         |        |                   |        |                                      |         |                      |                              |       |      |   | .866  | .626 | .197 | .017 | .094 |  |  |  |  |
|                                                                                                    | XDGX175030PDER-GM  | XDGX175030PDER-GM  | G     | E               | ●      | ●         |        |                   |        |                                      |         |                      |                              |       |      |   | .831  | .630 | .197 | .023 | .118 |  |  |  |  |
|                                                                                                    | XDGX175032PDER-GM  | XDGX175032PDER-GM  | G     | E               | ●      | ●         |        |                   |        |                                      |         |                      |                              |       |      |   | .831  | .630 | .197 | .015 | .126 |  |  |  |  |
|                                                                                                    | XDGX175040PDER-GM  | XDGX175040PDER-GM  | G     | E               | ●      | ●         |        |                   |        |                                      |         |                      |                              |       |      |   | .787  | .583 | .197 | .020 | .157 |  |  |  |  |
|                                                                                                    | XDGX175050PDER-GM  | XDGX175050PDER-GM  | G     | E               | ●      | ●         |        |                   |        |                                      |         |                      |                              |       |      |   | .764  | .591 | .197 | .014 | .197 |  |  |  |  |
| <b>AXD4000</b>  | XDGX175004PDFR-GM  | XDGX175004PDFR-GM  | G     | F               |        |           |        |                   |        |                                      |         |                      |                              | ●     |      |   | .906  | .669 | .197 | .066 | .016 |  |  |  |  |
|                                                                                                    | XDGX175008PDFR-GM  | XDGX175008PDFR-GM  | G     | F               |        |           |        |                   |        |                                      |         |                      |                              | ●     |      |   | .906  | .669 | .197 | .047 | .031 |  |  |  |  |
|                                                                                                    | XDGX175012PDFR-GM  | XDGX175012PDFR-GM  | G     | F               |        |           |        |                   |        |                                      |         |                      |                              | ●     |      |   | .906  | .669 | .197 | .035 | .047 |  |  |  |  |
|                                                                                                    | XDGX175016PDFR-GM  | XDGX175016PDFR-GM  | G     | F               |        |           |        |                   |        |                                      |         |                      |                              | ●     |      |   | .866  | .626 | .197 | .054 | .063 |  |  |  |  |
|                                                                                                    | XDGX175020PDFR-GM  | XDGX175020PDFR-GM  | G     | F               |        |           |        |                   |        |                                      |         |                      |                              | ●     |      |   | .866  | .626 | .197 | .033 | .079 |  |  |  |  |
|                                                                                                    | XDGX175024PDFR-GM  | XDGX175024PDFR-GM  | G     | F               |        |           |        |                   |        |                                      |         |                      |                              | ●     |      |   | .866  | .626 | .197 | .017 | .094 |  |  |  |  |
|                                                                                                    | XDGX175030PDFR-GM  | XDGX175030PDFR-GM  | G     | F               |        |           |        |                   |        |                                      |         |                      |                              | ●     |      |   | .831  | .630 | .197 | .023 | .118 |  |  |  |  |
|                                                                                                    | XDGX175032PDFR-GM  | XDGX175032PDFR-GM  | G     | F               |        |           |        |                   |        |                                      |         |                      |                              | ●     |      |   | .831  | .630 | .197 | .015 | .126 |  |  |  |  |
|                                                                                                    | XDGX175040PDFR-GM  | XDGX175040PDFR-GM  | G     | F               |        |           |        |                   |        |                                      |         |                      |                              | ●     |      |   | .787  | .583 | .197 | .020 | .157 |  |  |  |  |
|                                                                                                    | XDGX175050PDFR-GM  | XDGX175050PDFR-GM  | G     | F               |        |           |        |                   |        |                                      |         |                      |                              | ●     |      |   | .764  | .591 | .197 | .014 | .197 |  |  |  |  |
| <b>AXD7000</b>  | XDGX227008PDFR-GL  | XDGX227008PDFR-GL  | G     | F               |        |           |        | ★                 |        |                                      |         |                      |                              | ●     |      |   | 1.181 | .850 | .276 | .079 | .031 |  |  |  |  |
|                                                                                                    | XDGX227016PDFR-GL  | XDGX227016PDFR-GL  | G     | F               |        |           |        | ★                 |        |                                      |         |                      |                              | ●     |      |   | 1.181 | .854 | .276 | .048 | .063 |  |  |  |  |
|                                                                                                    | XDGX227020PDFR-GL  | XDGX227020PDFR-GL  | G     | F               |        |           |        | ★                 |        |                                      |         |                      |                              | ●     |      |   | 1.181 | .854 | .276 | .032 | .079 |  |  |  |  |
|                                                                                                    | XDGX227024PDFR-GL  | XDGX227024PDFR-GL  | G     | F               |        |           |        | □                 |        |                                      |         |                      |                              | ●     |      |   | 1.181 | .854 | .276 | .017 | .094 |  |  |  |  |
|                                                                                                    | XDGX227030PDFR-GL  | XDGX227030PDFR-GL  | G     | F               |        |           |        | ★                 |        |                                      |         |                      |                              | ●     |      |   | 1.134 | .835 | .276 | .033 | .118 |  |  |  |  |
|                                                                                                    | XDGX227032PDFR-GL  | XDGX227032PDFR-GL  | G     | F               |        |           |        | ★                 |        |                                      |         |                      |                              | ●     |      |   | 1.134 | .835 | .276 | .025 | .126 |  |  |  |  |
|                                                                                                    | XDGX227040PDFR-GL  | XDGX227040PDFR-GL  | G     | F               |        |           |        | ★                 |        |                                      |         |                      |                              | ●     |      |   | 1.083 | .811 | .276 | .038 | .157 |  |  |  |  |
|                                                                                                    | XDGX227050PDFR-GL  | XDGX227050PDFR-GL  | G     | F               |        |           |        | ★                 |        |                                      |         |                      |                              | ●     |      |   | 1.063 | .799 | .276 | .016 | .197 |  |  |  |  |
| <b>AXD7000</b>  | XDGX227008PDER-GLA | XDGX227008PDER-GLA | G     | E               | ●      | ●         |        |                   |        |                                      |         |                      |                              |       |      |   | 1.181 | .854 | .276 | .078 | .031 |  |  |  |  |
|                                                                                                    | XDGX227016PDER-GLA | XDGX227016PDER-GLA | G     | E               | ●      | ●         |        |                   |        |                                      |         |                      |                              |       |      |   | 1.181 | .854 | .276 | .046 | .063 |  |  |  |  |
|                                                                                                    | XDGX227020PDER-GLA | XDGX227020PDER-GLA | G     | E               | ●      | ●         |        |                   |        |                                      |         |                      |                              |       |      |   | 1.181 | .854 | .276 | .029 | .079 |  |  |  |  |
|                                                                                                    | XDGX227024PDER-GLA | XDGX227024PDER-GLA | G     | E               | ●      | ●         |        |                   |        |                                      |         |                      |                              |       |      |   | 1.181 | .854 | .276 | .013 | .094 |  |  |  |  |
|                                                                                                    | XDGX227030PDER-GLA | XDGX227030PDER-GLA | G     | E               | ●      | ●         |        |                   |        |                                      |         |                      |                              |       |      |   | 1.134 | .831 | .276 | .029 | .118 |  |  |  |  |
|                                                                                                    | XDGX227032PDER-GLA | XDGX227032PDER-GLA | G     | E               | ●      | ●         |        |                   |        |                                      |         |                      |                              |       |      |   | 1.134 | .831 | .276 | .022 | .126 |  |  |  |  |
|                                                                                                    | XDGX227040PDER-GLA | XDGX227040PDER-GLA | G     | E               | ●      | ●         |        |                   |        |                                      |         |                      |                              |       |      |   | 1.083 | .803 | .276 | .033 | .157 |  |  |  |  |
|                                                                                                    | XDGX227050PDER-GLA | XDGX227050PDER-GLA | G     | E               | ●      | ●         |        |                   |        |                                      |         |                      |                              |       |      |   | 1.063 | .795 | .276 | .009 | .197 |  |  |  |  |
| <b>BAE500</b>   | AEMW150304ER       | AEMW150304ER       | M     | E               |        |           |        | ●                 | ★      | ●                                    |         |                      |                              |       |      |   | .657  | .598 | .125 | —    | .016 |  |  |  |  |
|                                                                                                    | AEMW150308ER       | AEMW150308ER       | M     | E               |        |           |        | ●                 | ★      | ●                                    |         |                      |                              |       |      |   | .654  | .583 | .125 | —    | .031 |  |  |  |  |

● : USA Stock ★ : Stocked in Japan □ : Made to Order  
 <10 inserts in one case>

| Work Material                                                                                                  | P                      | Steel                                |       |       |       |       |       | Cutting Conditions (Guide) : |      |      |      |      |      |
|----------------------------------------------------------------------------------------------------------------|------------------------|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|------|------|------|------|------|
|                                                                                                                | M                      | Stainless Steel                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | ●                            | ●    | ●    | ●    | ●    | ●    |
|                                                                                                                | K                      | Cast Iron                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | ●                            | ●    | ●    | ●    | ●    | ●    |
|                                                                                                                | N                      | Non-Ferrous Metal                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | ●                            | ●    | ●    | ●    | ●    | ●    |
|                                                                                                                | S                      | Heat-resistant Alloy, Titanium Alloy |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | ●                            | ●    | ●    | ●    | ●    | ●    |
|                                                                                                                | H                      | Hardened Steel                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | ●                            | ●    | ●    | ●    | ●    | ●    |
| Cutter Type<br>Insert Geometry                                                                                 | Order Number           | (ISO) Number                         | Class                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Honing                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Coated                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Cermet                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Carbide                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Dimensions (inch)            |      |      |      |      |      |
|                                                                                                                |                        |                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | F7030<br>VP15TF<br>UP20M<br>NX4545                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | UT120T<br>HT110                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | L                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | LE                           | W1   | S    | BS   | RE   |      |
| <b>BAE600</b><br>             | <b>AEMW19T304ER</b>    | AEMW19T304ER                         | M                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | E                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | ●                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | ●                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | .793                         | .724 | .500 | .156 | —    | .016 |
|                                                                                                                | <b>AEMW19T308ER</b>    | AEMW19T308ER                         | M                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | E                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | ●                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | ●                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | .791                         | .709 | .500 | .156 | —    | .031 |
|                                                                                                                |                        |                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                              |      |      |      |      |      |
| <b>BAP300</b><br>             | <b>APGT1135PDFR-G2</b> | APGT1135PDFR-G2                      | G                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | F                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | ●                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | .445                         | .382 | .250 | .138 | .047 | .031 |
|                                                                                                                |                        |                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                              |      |      |      |      |      |
| <b>BAP300 SRM2 L274</b><br> | <b>APMT1135PDER-H1</b> | APMT1135PDER-H1                      | M                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | E                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | ●                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | ★                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | .442                         | .354 | .250 | .138 | .059 | .016 |
|                                                                                                                | <b>APMT1135PDER-H2</b> | APMT1135PDER-H2                      | M                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | E                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | ●                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | ●                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | ●                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | .442                         | .354 | .250 | .138 | .047 | .031 |
|                                                                                                                | <b>APMT1135PDER-H6</b> | APMT1135PDER-H6                      | M                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | E                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | ★                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | .437                         | .354 | .250 | .138 | .016 | .094 |
|                                                                                                                |                        |                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                              |      |      |      |      |      |
| <b>BAP300</b><br>           | <b>APMT1135PDER-M0</b> | APMT1135PDER-M0                      | M                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | E                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | ●                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | .442                         | .354 | .250 | .138 | .071 | .008 |
|                                                                                                                | <b>APMT1135PDER-M1</b> | APMT1135PDER-M1                      | M                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | E                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | ●                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | .442                         | .354 | .250 | .138 | .059 | .016 |
|                                                                                                                | <b>APMT1135PDER-M2</b> | APMT1135PDER-M2                      | M                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | E                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | ●                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | ●                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | ●                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | .440                         | .354 | .250 | .138 | .047 | .031 |
|                                                                                                                |                        |                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                              |      |      |      |      |      |
| <b>BAP400</b><br>           | <b>APGT1604PDFR-G2</b> | APGT1604PDFR-G2                      | G                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | F                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | ●                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | .670                         | .551 | .375 | .187 | .055 | .031 |
|                                                                                                                |                        |                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                              |      |      |      |      |      |
| <b>BAP400</b><br>           | <b>APMT1604PDER-H1</b> | APMT1604PDER-H1                      | M                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | E                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | ★                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | .670                         | .551 | .375 | .187 | .067 | .016 |
|                                                                                                                | <b>APMT1604PDER-H2</b> | APMT1604PDER-H2                      | M                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | E                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | ●                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | ●                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | ●                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | .674                         | .551 | .375 | .187 | .055 | .031 |
|                                                                                                                | <b>APMT1604PDER-H4</b> | APMT1604PDER-H4                      | M                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | E                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | ★                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | .672                         | .551 | .375 | .187 | .016 | .063 |
|                                                                                                                | <b>APMT1604PDER-H6</b> | APMT1604PDER-H6                      | M                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | E                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | ★                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | .667                         | .551 | .375 | .187 | .016 | .094 |
|                                                                                                                | <b>APMT1604PDER-H8</b> | APMT1604PDER-H8                      | M                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | E                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | ★                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | .661                         | .551 | .375 | .187 | .016 | .126 |
|                                                                                                                |                        |                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                              |      |      |      |      |      |
| <b>BAP400</b><br>           | <b>APMT1604PDER-M2</b> | APMT1604PDER-M2                      | M                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | E                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | ●                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | ●                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | ●                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | .673                         | .551 | .375 | .187 | .055 | .031 |
|                                                                                                                |                        |                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                              |      |      |      |      |      |

K

ROTATING TOOL INSERTS

# ROTATING INSERTS

## ROTATING TOOL INSERTS

K

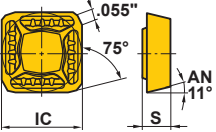
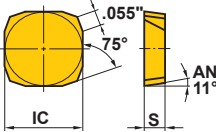
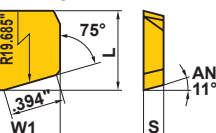
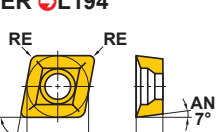
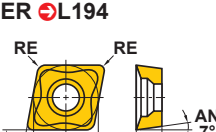
# ROTATING INSERTS

| Work Material | P | Steel | M | Stainless Steel | K | Cast Iron | N | Non-Ferrous Metal | S | Heat-resistant Alloy, Titanium Alloy | H | Hardened Steel | Cutting Conditions (Guide) : |   |   |   |   |   |   |   |   |   | Honing : |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   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|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   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|   |   |   |   |   |   |   |   |   |   |
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| ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● 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| ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |

\* Grade NX2525 and NX4545 have "T" honing. Grade HT10 has "F" honing.

K

ROTATING TOOL INSERTS

| Work Material                                                                                                                   | P                    | Steel                                |      |      |      | Cutting Conditions (Guide) : |         |       |                   |        |        |       |      |      |      |      |
|---------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|---------|-------|-------------------|--------|--------|-------|------|------|------|------|
|                                                                                                                                 | M                    | Stainless Steel                      |                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                     | ●                            | ●       | ●     | ●                 | ●      |        |       |      |      |      |      |
|                                                                                                                                 | K                    | Cast Iron                            |                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                     | +                            | +       | +     | +                 | +      |        |       |      |      |      |      |
|                                                                                                                                 | N                    | Non-Ferrous Metal                    |                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                     |                              |         |       |                   |        |        |       |      |      |      |      |
|                                                                                                                                 | S                    | Heat-resistant Alloy, Titanium Alloy |                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                     |                              |         |       |                   |        |        |       |      |      |      |      |
|                                                                                                                                 | H                    | Hardened Steel                       |                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                     |                              |         |       |                   |        |        |       |      |      |      |      |
| Cutter Type<br>Insert Geometry                                                                                                  | Order Number         | (ISO) Number                         | Class                                                                                                                                                                                                                                                                                                                                                                                                                     | Honing                                                                                                                                                                                                                                                                                                                                                                                                                    | Coated                                                                                                                                                                                                                                                                                                                                                                                                                              |                              | Carbide |       | Dimensions (inch) |        |        |       |      |      |      |      |
|                                                                                                                                 |                      |                                      |                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                           | F7030                                                                                                                                                                                                                                                                                                                                                                                                                               | MC5020                       | VP15TF  | UP20M | AP10H             | UT120T | HT105T | HT110 | L    | LE   | W1   | IC   |
| <b>FBP415</b><br>                              | <b>SPER42EEER-JS</b> | SPER1203EEER-JS                      | E                                                                                                                                                                                                                                                                                                                                                                                                                         | E                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                     | ●                            |         |       |                   |        | —      | —     | —    | .500 | .125 | —    |
|                                                                                                                                 |                      |                                      |                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                     |                              |         |       |                   |        |        |       |      |      |      |      |
| <b>FBP415</b><br><br>Right hand insert shown.  | <b>SPNN42EEER1</b>   | SPNN1203EEER1                        | N                                                                                                                                                                                                                                                                                                                                                                                                                         | E                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                     | ●                            |         |       |                   | ★      | —      | —     | —    | .500 | .125 | —    |
|                                                                                                                                 | <b>SPNN42EEEL1</b>   | SPNN1203EEEL1                        | N                                                                                                                                                                                                                                                                                                                                                                                                                         | E                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                     |                              |         |       |                   | ★      | —      | —     | —    | .500 | .125 | —    |
| <b>FBP415</b><br><br>Right hand insert shown. | <b>WPC42EEER10C</b>  | WPC42EEER10C                         | C                                                                                                                                                                                                                                                                                                                                                                                                                         | E                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                     |                              |         |       | ●                 |        | .597   | —     | .500 | —    | .125 | —    |
|                                                                                                                                 | <b>WPC42EEEL10C</b>  | WPC42EEEL10C                         | C                                                                                                                                                                                                                                                                                                                                                                                                                         | E                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                     |                              |         |       | ★                 |        | .597   | —     | .500 | —    | .125 | —    |
| <b>LER L194</b><br>                          | <b>CCMX083508ENA</b> | CCMX083508EN-A                       | M                                                                                                                                                                                                                                                                                                                                                                                                                         | E                                                                                                                                                                                                                                                                                                                                                                                                                         | ★                                                                                                                                                                                                                                                                                                                                                                                                                                   |                              | ●       |       | ★                 |        | —      | —     | —    | .313 | .138 | .031 |
|                                                                                                                                 | <b>CCMX09T308ENA</b> | CCMX09T308EN-A                       | M                                                                                                                                                                                                                                                                                                                                                                                                                         | E                                                                                                                                                                                                                                                                                                                                                                                                                         | ●                                                                                                                                                                                                                                                                                                                                                                                                                                   |                              | ●       | ●     | ★                 |        | —      | —     | —    | .375 | .156 | .031 |
| <b>LER L194</b><br>                          | <b>CCMX09T308ENB</b> | CCMX09T308EN-B                       | M                                                                                                                                                                                                                                                                                                                                                                                                                         | E                                                                                                                                                                                                                                                                                                                                                                                                                         | ★                                                                                                                                                                                                                                                                                                                                                                                                                                   |                              |         |       | ★                 |        | —      | —     | —    | .375 | .156 | .031 |
|                                                                                                                                 |                      |                                      |                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                     |                              |         |       |                   |        |        |       |      |      |      |      |
| <b>LER L194</b><br>                          | <b>ZCMX083508ERA</b> | ZCMX083508ER-A                       | M                                                                                                                                                                                                                                                                                                                                                                                                                         | E                                                                                                                                                                                                                                                                                                                                                                                                                         | ★                                                                                                                                                                                                                                                                                                                                                                                                                                   |                              |         |       | ★                 |        | .409   | .335  | .313 | —    | .137 | .031 |
|                                                                                                                                 | <b>ZCMX09T308ERA</b> | ZCMX09T308ER-A                       | M                                                                                                                                                                                                                                                                                                                                                                                                                         | E                                                                                                                                                                                                                                                                                                                                                                                                                         | ●                                                                                                                                                                                                                                                                                                                                                                                                                                   |                              | ●       | ●     | ★                 |        | .472   | .433  | .375 | —    | .156 | .031 |
| <b>LER L194</b><br>                          | <b>ZCMX09T308ERB</b> | ZCMX09T308ER-B                       | M                                                                                                                                                                                                                                                                                                                                                                                                                         | E                                                                                                                                                                                                                                                                                                                                                                                                                         | ★                                                                                                                                                                                                                                                                                                                                                                                                                                   |                              | ●       |       | ★                 |        | .472   | .433  | .375 | —    | .156 | .031 |
|                                                                                                                                 |                      |                                      |                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                     |                              |         |       |                   |        |        |       |      |      |      |      |

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ROTATING TOOL INSERTS

# ROTATING TOOL INSERTS

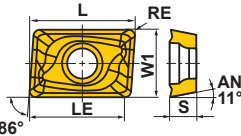
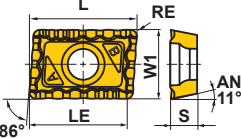
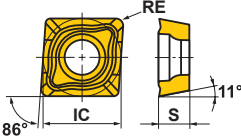
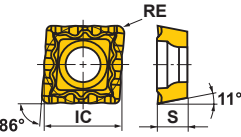
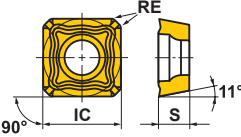
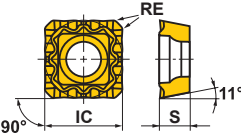
| Work Material | P | Steel | 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● : USA Stock ★ : Stocked in Japan  
<10 inserts in one case>

K

# ROTATING INSERTS

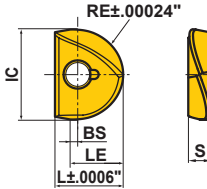
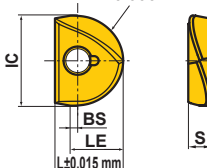
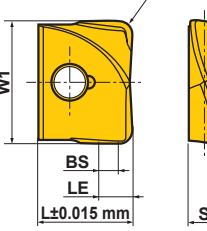
## ROTATING TOOL INSERTS

|                                                                                                                                                                                     |               |                                      |                                                                                     |                                                                                                                                |                            |                   |      |      |      |      |      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|--------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|----------------------------|-------------------|------|------|------|------|------|
| Work Material                                                                                                                                                                       | P             | Steel                                | <div><div>●</div><div>●</div><div>●</div><div>✖</div><div>●</div><div>✖</div></div> | Cutting Conditions (Guide) :<br>● : Stable Cutting<br>● : General Cutting<br>✖ : Unstable Cutting<br><br>Honing :<br>E : Round |                            |                   |      |      |      |      |      |
|                                                                                                                                                                                     | M             | Stainless Steel                      |                                                                                     |                                                                                                                                |                            |                   |      |      |      |      |      |
|                                                                                                                                                                                     | K             | Cast Iron                            |                                                                                     |                                                                                                                                |                            |                   |      |      |      |      |      |
|                                                                                                                                                                                     | N             | Non-Ferrous Metal                    |                                                                                     |                                                                                                                                |                            |                   |      |      |      |      |      |
|                                                                                                                                                                                     | S             | Heat-resistant Alloy, Titanium Alloy |                                                                                     |                                                                                                                                |                            |                   |      |      |      |      |      |
|                                                                                                                                                                                     | H             | Hardened Steel                       |                                                                                     |                                                                                                                                |                            |                   |      |      |      |      |      |
| Cutter Type<br>Insert Geometry                                                                                                                                                      | Order Number  | (ISO) Number                         | Class                                                                               | Honing                                                                                                                         | Coated<br>VP15TF<br>VP20RT | Dimensions (inch) |      |      |      |      |      |
|                                                                                                                                                                                     |               |                                      |                                                                                     |                                                                                                                                |                            | L                 | LE   | W1   | IC   | S    | RE   |
| SPX  L180<br>     | JPMX140412-JM | JPMX140412-JM                        | M                                                                                   | E                                                                                                                              | ●●                         | .563              | .508 | .500 | —    | .187 | .047 |
|                                                                                                                                                                                     | JPMX190412-JM | JPMX190412-JM                        | M                                                                                   | E                                                                                                                              | ●●                         | .750              | .693 | .500 | —    | .187 | .047 |
|                                                                                                                                                                                     |               |                                      |                                                                                     |                                                                                                                                |                            |                   |      |      |      |      |      |
| SPX  L180<br>     | JPMX140412-WH | JPMX140412-WH                        | M                                                                                   | E                                                                                                                              | ●●                         | .563              | .508 | .500 | —    | .187 | .047 |
|                                                                                                                                                                                     | JPMX190412-WH | JPMX190412-WH                        | M                                                                                   | E                                                                                                                              | ●●                         | .750              | .693 | .500 | —    | .187 | .047 |
|                                                                                                                                                                                     |               |                                      |                                                                                     |                                                                                                                                |                            |                   |      |      |      |      |      |
| SPX  L180<br>   | MPMX120412-JM | MPMX120412-JM                        | M                                                                                   | E                                                                                                                              | ●●                         | —                 | —    | —    | .500 | .187 | .047 |
|                                                                                                                                                                                     |               |                                      |                                                                                     |                                                                                                                                |                            |                   |      |      |      |      |      |
| SPX  L180<br> | MPMX120412-WH | MPMX120412-WH                        | M                                                                                   | E                                                                                                                              | ●●                         | —                 | —    | —    | .500 | .187 | .047 |
|                                                                                                                                                                                     |               |                                      |                                                                                     |                                                                                                                                |                            |                   |      |      |      |      |      |
| SPX  L180<br> | SPMX120408-JM | SPMX120408-JM                        | M                                                                                   | E                                                                                                                              | ●●                         | —                 | —    | —    | .500 | .187 | .031 |
|                                                                                                                                                                                     |               |                                      |                                                                                     |                                                                                                                                |                            |                   |      |      |      |      |      |
| SPX  L180<br> | SPMX120408-WH | SPMX120408-WH                        | M                                                                                   | E                                                                                                                              | ●●                         | —                 | —    | —    | .500 | .187 | .031 |
|                                                                                                                                                                                     |               |                                      |                                                                                     |                                                                                                                                |                            |                   |      |      |      |      |      |

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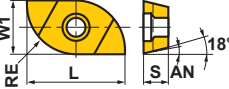
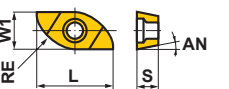
ROTATING TOOL INSERTS

# ROTATING INSERTS

| Work Material                                                                                                        | P            | Steel                                | <div><div><div>C</div><div>G</div><div>R</div><div>B</div><div>S</div></div><div><div>●</div><div>●</div><div>✱</div></div></div> | Cutting Conditions (Guide) : |        |        |        |                   |      |       |       |      |      |       |       |
|----------------------------------------------------------------------------------------------------------------------|--------------|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|------------------------------|--------|--------|--------|-------------------|------|-------|-------|------|------|-------|-------|
|                                                                                                                      | M            | Stainless Steel                      |                                                                                                                                   | ● : Stable Cutting           |        |        |        |                   |      |       |       |      |      |       |       |
|                                                                                                                      | K            | Cast Iron                            |                                                                                                                                   | ● : General Cutting          |        |        |        |                   |      |       |       |      |      |       |       |
|                                                                                                                      | N            | Non-Ferrous Metal                    |                                                                                                                                   | ✱ : Unstable Cutting         |        |        |        |                   |      |       |       |      |      |       |       |
|                                                                                                                      | S            | Heat-resistant Alloy, Titanium Alloy |                                                                                                                                   | Honing :                     |        |        |        |                   |      |       |       |      |      |       |       |
|                                                                                                                      | H            | Hardened Steel                       |                                                                                                                                   | F : Sharp                    |        |        |        |                   |      |       |       |      |      |       |       |
| Cutter Type<br>Insert Geometry                                                                                       | Order Number | (ISO) Number                         | Class                                                                                                                             | Honing                       | Coated |        |        | Dimensions (inch) |      |       |       |      |      |       |       |
|                                                                                                                      |              |                                      |                                                                                                                                   |                              | EP6120 | VP15TF | MP8010 | L                 | LE   | W1    | IC    | S    | BS   | RE    | APMX  |
| <b>SRF L262</b><br>            | SRFT0375     | SRFT0375                             | —                                                                                                                                 | F                            | ●      | ●      | ●      | .335              | .216 | —     | .375  | .102 | .020 | .1875 | —     |
|                                                                                                                      | SRFT0500     | SRFT0500                             | —                                                                                                                                 | F                            | ●      | ●      | ●      | .394              | .256 | —     | .500  | .118 | .020 | .2500 | —     |
|                                                                                                                      | SRFT0625     | SRFT0625                             | —                                                                                                                                 | F                            | ●      | ●      | ●      | .472              | .354 | —     | .625  | .158 | .039 | .3125 | —     |
|                                                                                                                      | SRFT0750     | SRFT0750                             | —                                                                                                                                 | F                            | ●      | ●      | ●      | .591              | .433 | —     | .750  | .197 | .039 | .3750 | —     |
|                                                                                                                      | SRFT1000     | SRFT1000                             | —                                                                                                                                 | F                            | ●      | ●      | ●      | .728              | .531 | —     | 1.000 | .236 | .039 | .5000 | —     |
|                                                                                                                      | SRFT1250     | SRFT1250                             | —                                                                                                                                 | F                            | ●      | ●      | ●      | .925              | .669 | —     | 1.250 | .276 | .039 | .6250 | —     |
|                                                                                                                      |              |                                      |                                                                                                                                   |                              |        |        |        |                   |      |       |       |      |      |       |       |
| <b>SRF (METRIC) L262</b><br>  | SRFT10       | SRFT10                               | —                                                                                                                                 | F                            | ★      | ★      | ★      | .335              | .217 | —     | .394  | .102 | .020 | .1969 | —     |
|                                                                                                                      | SRFT12       | SRFT12                               | —                                                                                                                                 | F                            | ★      | ★      | ★      | .394              | .256 | —     | .472  | .118 | .020 | .2362 | —     |
|                                                                                                                      | SRFT16       | SRFT16                               | —                                                                                                                                 | F                            | ★      | ★      | ★      | .472              | .354 | —     | .630  | .157 | .039 | .3150 | —     |
|                                                                                                                      | SRFT20       | SRFT20                               | —                                                                                                                                 | F                            | ★      | ★      | ★      | .591              | .433 | —     | .787  | .197 | .039 | .3937 | —     |
|                                                                                                                      | SRFT25       | SRFT25                               | —                                                                                                                                 | F                            | ★      | ★      | ★      | .728              | .531 | —     | .984  | .236 | .039 | .4921 | —     |
|                                                                                                                      | SRFT30       | SRFT30                               | —                                                                                                                                 | F                            | ★      | ★      | ★      | .886              | .630 | —     | 1.181 | .276 | .039 | .5906 | —     |
|                                                                                                                      | SRFT32       | SRFT32                               | —                                                                                                                                 | F                            | ★      | ★      | ★      | .925              | .669 | —     | 1.260 | .276 | .039 | .6299 | —     |
| <b>SUF (METRIC) L262</b><br> | SUFT10R05    | SUFT10R05                            | —                                                                                                                                 | F                            |        | ★      | ★      | .335              | .059 | .394  | —     | .102 | .039 | .0197 | .0591 |
|                                                                                                                      | SUFT10R10    | SUFT10R10                            | —                                                                                                                                 | F                            |        | ★      | ★      | .335              | .079 | .394  | —     | .102 | .039 | .0394 | .0787 |
|                                                                                                                      | SUFT10R20    | SUFT10R20                            | —                                                                                                                                 | F                            |        | ★      | ★      | .335              | .118 | .394  | —     | .102 | .039 | .0787 | .1181 |
|                                                                                                                      | SUFT12R05    | SUFT12R05                            | —                                                                                                                                 | F                            |        | ★      | ★      | .394              | .067 | .472  | —     | .118 | .047 | .0197 | .0669 |
|                                                                                                                      | SUFT12R10    | SUFT12R10                            | —                                                                                                                                 | F                            |        | ★      | ★      | .394              | .087 | .472  | —     | .118 | .047 | .0394 | .0866 |
|                                                                                                                      | SUFT12R20    | SUFT12R20                            | —                                                                                                                                 | F                            |        | ★      | ★      | .394              | .126 | .472  | —     | .118 | .047 | .0787 | .1260 |
|                                                                                                                      | SUFT12R30    | SUFT12R30                            | —                                                                                                                                 | F                            |        | ★      | ★      | .394              | .165 | .472  | —     | .118 | .047 | .1181 | .1654 |
|                                                                                                                      | SUFT16R05    | SUFT16R05                            | —                                                                                                                                 | F                            |        | ★      | ★      | .472              | .083 | .630  | —     | .157 | .063 | .0197 | .0827 |
|                                                                                                                      | SUFT16R10    | SUFT16R10                            | —                                                                                                                                 | F                            |        | ★      | ★      | .472              | .102 | .630  | —     | .157 | .063 | .0394 | .1024 |
|                                                                                                                      | SUFT16R15    | SUFT16R15                            | —                                                                                                                                 | F                            |        | ★      | ★      | .472              | .122 | .630  | —     | .157 | .063 | .0591 | .1220 |
|                                                                                                                      | SUFT16R20    | SUFT16R20                            | —                                                                                                                                 | F                            |        | ★      | ★      | .472              | .142 | .630  | —     | .157 | .063 | .0787 | .1417 |
|                                                                                                                      | SUFT16R30    | SUFT16R30                            | —                                                                                                                                 | F                            |        | ★      | ★      | .472              | .181 | .630  | —     | .157 | .063 | .1181 | .1811 |
|                                                                                                                      | SUFT20R05    | SUFT20R05                            | —                                                                                                                                 | F                            |        | ★      | ★      | .591              | .098 | .787  | —     | .197 | .079 | .0197 | .0984 |
|                                                                                                                      | SUFT20R10    | SUFT20R10                            | —                                                                                                                                 | F                            |        | ★      | ★      | .591              | .118 | .787  | —     | .197 | .079 | .0394 | .1181 |
|                                                                                                                      | SUFT20R15    | SUFT20R15                            | —                                                                                                                                 | F                            |        | ★      | ★      | .591              | .138 | .787  | —     | .197 | .079 | .0591 | .1378 |
|                                                                                                                      | SUFT20R20    | SUFT20R20                            | —                                                                                                                                 | F                            |        | ★      | ★      | .591              | .157 | .787  | —     | .197 | .079 | .0787 | .1575 |
|                                                                                                                      | SUFT20R30    | SUFT20R30                            | —                                                                                                                                 | F                            |        | ★      | ★      | .591              | .197 | .787  | —     | .197 | .079 | .1181 | .1969 |
|                                                                                                                      | SUFT25R05    | SUFT25R05                            | —                                                                                                                                 | F                            |        | ★      | ★      | .728              | .118 | .984  | —     | .236 | .098 | .0197 | .1181 |
|                                                                                                                      | SUFT25R10    | SUFT25R10                            | —                                                                                                                                 | F                            |        | ★      | ★      | .728              | .138 | .984  | —     | .236 | .098 | .0394 | .1378 |
|                                                                                                                      | SUFT25R20    | SUFT25R20                            | —                                                                                                                                 | F                            |        | ★      | ★      | .728              | .177 | .984  | —     | .236 | .098 | .0787 | .1772 |
|                                                                                                                      | SUFT25R30    | SUFT25R30                            | —                                                                                                                                 | F                            |        | ★      | ★      | .728              | .217 | .984  | —     | .236 | .098 | .1181 | .2165 |
|                                                                                                                      | SUFT30R05    | SUFT30R05                            | —                                                                                                                                 | F                            |        | ★      | ★      | .886              | .138 | 1.181 | —     | .276 | .118 | .0197 | .1378 |
|                                                                                                                      | SUFT30R10    | SUFT30R10                            | —                                                                                                                                 | F                            |        | ★      | ★      | .886              | .157 | 1.181 | —     | .276 | .118 | .0394 | .1575 |
|                                                                                                                      | SUFT30R20    | SUFT30R20                            | —                                                                                                                                 | F                            |        | ★      | ★      | .886              | .197 | 1.181 | —     | .276 | .118 | .0787 | .1969 |
|                                                                                                                      | SUFT30R30    | SUFT30R30                            | —                                                                                                                                 | F                            |        | ★      | ★      | .886              | .236 | 1.181 | —     | .276 | .118 | .1181 | .2362 |
|                                                                                                                      | SUFT32R05    | SUFT32R05                            | —                                                                                                                                 | F                            |        | ★      | ★      | .925              | .146 | 1.26  | —     | .276 | .126 | .0197 | .1457 |
|                                                                                                                      | SUFT32R10    | SUFT32R10                            | —                                                                                                                                 | F                            |        | ★      | ★      | .925              | .165 | 1.26  | —     | .276 | .126 | .0394 | .1772 |
|                                                                                                                      | SUFT32R20    | SUFT32R20                            | —                                                                                                                                 | F                            |        | ★      | ★      | .925              | .205 | 1.26  | —     | .276 | .126 | .0787 | .2047 |

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ROTATING TOOL INSERTS

| Work Material                                                                                            | P                | Steel                                | C       | M      | K                          | N                 | S     | H    | Cutting Conditions (Guide) : |                    |  |  |  |
|----------------------------------------------------------------------------------------------------------|------------------|--------------------------------------|---------|--------|----------------------------|-------------------|-------|------|------------------------------|--------------------|--|--|--|
|                                                                                                          | M                | Stainless Steel                      |         |        |                            |                   |       |      | ●                            | : Stable Cutting   |  |  |  |
|                                                                                                          | K                | Cast Iron                            |         |        |                            |                   |       |      | ●                            | : General Cutting  |  |  |  |
|                                                                                                          | N                | Non-Ferrous Metal                    |         |        |                            |                   |       |      | ✱                            | : Unstable Cutting |  |  |  |
|                                                                                                          | S                | Heat-resistant Alloy, Titanium Alloy |         |        |                            |                   |       |      | Honing :                     |                    |  |  |  |
| H                                                                                                        | Hardened Steel   | E                                    | : Round |        |                            |                   |       |      |                              |                    |  |  |  |
| Cutter Type<br>Insert Geometry                                                                           | Order Number     | (ISO) Number                         | Class   | Honing | Coated                     | Dimensions (inch) |       |      |                              |                    |  |  |  |
|                                                                                                          |                  |                                      |         |        | MP6120<br>MP9120<br>VP15TF | RE                | L     | W1   | S                            | AN                 |  |  |  |
| <b>SRM2 </b>            | <b>SRM212C</b>   | SRM212C                              | M       | E      | ●●●●                       | .375              | .748  | .385 | .169                         | 11°                |  |  |  |
|                                                                                                          | <b>SRM216C</b>   | SRM216C                              | M       | E      | ●●●●                       | .500              | .945  | .512 | .216                         | 11°                |  |  |  |
|                                                                                                          | <b>SRM220C</b>   | SRM220C                              | M       | E      | ●●●●                       | .625              | 1.102 | .638 | .275                         | 11°                |  |  |  |
|                                                                                                          |                  |                                      |         |        |                            |                   |       |      |                              |                    |  |  |  |
| <b>SRM2 </b>            | <b>SRM212E</b>   | SRM212E                              | M       | E      | ●●●●                       | .375              | .610  | .315 | .169                         | 11°                |  |  |  |
|                                                                                                          | <b>SRM216E</b>   | SRM216E                              | M       | E      | ●●●●                       | .500              | .807  | .409 | .216                         | 11°                |  |  |  |
|                                                                                                          | <b>SRM220E</b>   | SRM220E                              | M       | E      | ●●●●                       | .625              | .964  | .520 | .275                         | 11°                |  |  |  |
|                                                                                                          |                  |                                      |         |        |                            |                   |       |      |                              |                    |  |  |  |
| <b>SRM2 </b>          | <b>SRM210C-M</b> | SRM210C-M                            | M       | E      | ●●●●                       | .313              | .630  | .323 | .138                         | 11°                |  |  |  |
|                                                                                                          | <b>SRM212C-M</b> | SRM212C-M                            | M       | E      | ●●●●                       | .375              | .748  | .385 | .169                         | 11°                |  |  |  |
|                                                                                                          | <b>SRM216C-M</b> | SRM216C-M                            | M       | E      | ●●●●                       | .500              | .945  | .512 | .216                         | 11°                |  |  |  |
|                                                                                                          | <b>SRM220C-M</b> | SRM220C-M                            | M       | E      | ●●●●                       | .625              | 1.102 | .638 | .275                         | 11°                |  |  |  |
|                                                                                                          |                  |                                      |         |        |                            |                   |       |      |                              |                    |  |  |  |
| <b>SRM2 </b>          | <b>SRM210E-M</b> | SRM210E-M                            | M       | E      | ●●●●                       | .313              | .531  | .258 | .138                         | 11°                |  |  |  |
|                                                                                                          | <b>SRM212E-M</b> | SRM212E-M                            | M       | E      | ●●●●                       | .375              | .610  | .315 | .169                         | 11°                |  |  |  |
|                                                                                                          | <b>SRM216E-M</b> | SRM216E-M                            | M       | E      | ●●●●                       | .500              | .807  | .409 | .216                         | 11°                |  |  |  |
|                                                                                                          | <b>SRM220E-M</b> | SRM220E-M                            | M       | E      | ●●●●                       | .625              | .964  | .520 | .275                         | 11°                |  |  |  |
|                                                                                                          |                  |                                      |         |        |                            |                   |       |      |                              |                    |  |  |  |
| <b>SRM2 (METRIC) </b> | <b>SRG16C</b>    | SRG16C                               | G       | E      | ★ ★ ★                      | .315              | .630  | .323 | .138                         | 11°                |  |  |  |
|                                                                                                          | <b>SRG20C</b>    | SRG20C                               | G       | E      | ★ ★ ★                      | .394              | .748  | .402 | .181                         | 10°                |  |  |  |
|                                                                                                          | <b>SRG25C</b>    | SRG25C                               | G       | E      | ★ ★ ★                      | .492              | .945  | .504 | .217                         | 10°                |  |  |  |
|                                                                                                          | <b>SRG30C</b>    | SRG30C                               | G       | E      | ★ ★ ★                      | .591              | 1.102 | .602 | .276                         | 10°                |  |  |  |
|                                                                                                          | <b>SRG32C</b>    | SRG32C                               | G       | E      | ★ ★ ★                      | .630              | 1.102 | .642 | .276                         | 10°                |  |  |  |
|                                                                                                          |                  |                                      |         |        |                            |                   |       |      |                              |                    |  |  |  |
| <b>SRM2 (METRIC) </b> | <b>SRG16E</b>    | SRG16E                               | G       | E      | ★ ★ ★                      | .315              | .531  | .264 | .138                         | 11°                |  |  |  |
|                                                                                                          | <b>SRG20E</b>    | SRG20E                               | G       | E      | ★ ★ ★                      | .394              | .610  | .335 | .181                         | 9°                 |  |  |  |
|                                                                                                          | <b>SRG25E</b>    | SRG25E                               | G       | E      | ★ ★ ★                      | .492              | .807  | .402 | .217                         | 9°                 |  |  |  |
|                                                                                                          | <b>SRG30E</b>    | SRG30E                               | G       | E      | ★ ★ ★                      | .591              | .992  | .480 | .276                         | 9°                 |  |  |  |
|                                                                                                          | <b>SRG32E</b>    | SRG32E                               | G       | E      | ★ ★ ★                      | .630              | 1.028 | .516 | .276                         | 9°                 |  |  |  |
|                                                                                                          |                  |                                      |         |        |                            |                   |       |      |                              |                    |  |  |  |
| <b>SRM2 (METRIC) </b> | <b>SRM16C-M</b>  | SRM16C-M                             | M       | E      | ★ ★ ★                      | .315              | .630  | .323 | .138                         | 11°                |  |  |  |
|                                                                                                          | <b>SRM20C-M</b>  | SRM20C-M                             | M       | E      | ★ ★ ★                      | .394              | .748  | .402 | .181                         | 10°                |  |  |  |
|                                                                                                          | <b>SRM25C-M</b>  | SRM25C-M                             | M       | E      | ★ ★ ★                      | .492              | .945  | .504 | .217                         | 10°                |  |  |  |
|                                                                                                          | <b>SRM30C-M</b>  | SRM30C-M                             | M       | E      | ★ ★ ★                      | .591              | 1.102 | .602 | .276                         | 10°                |  |  |  |
|                                                                                                          | <b>SRM32C-M</b>  | SRM32C-M                             | M       | E      | ★ ★ ★                      | .630              | 1.102 | .642 | .276                         | 10°                |  |  |  |
|                                                                                                          |                  |                                      |         |        |                            |                   |       |      |                              |                    |  |  |  |

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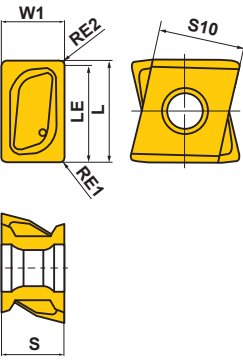
ROTATING TOOL INSERTS

# ROTATING INSERTS

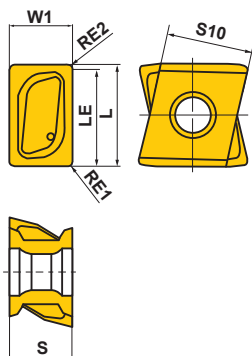
| Work Material | P | Steel |       |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
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ROTATING TOOL INSERTS

| Work Material                                                                                                                                           | P                | Steel                                |                  |        |        |        | <div>Cutting Conditions (Guide) :</div> <div>● : Stable Cutting</div> <div>● : General Cutting</div> <div>✖ : Unstable Cutting</div> <div>Honing :</div> <div>E : Round</div> |      |      |      |      |      |      |      |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|--------------------------------------|------------------|--------|--------|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|------|------|------|------|------|
|                                                                                                                                                         | M                | Stainless Steel                      |                  |        |        |        |                                                                                                                                                                               |      |      |      |      |      |      |      |
|                                                                                                                                                         | K                | Cast Iron                            |                  |        |        |        |                                                                                                                                                                               |      |      |      |      |      |      |      |
|                                                                                                                                                         | N                | Non-ferrous Metal                    |                  |        |        |        |                                                                                                                                                                               |      |      |      |      |      |      |      |
|                                                                                                                                                         | S                | Heat-resistant Alloy, Titanium Alloy |                  |        |        |        |                                                                                                                                                                               |      |      |      |      |      |      |      |
| H                                                                                                                                                       | Hardened Steel   |                                      |                  |        |        |        |                                                                                                                                                                               |      |      |      |      |      |      |      |
| Cutter Type<br>Insert Geometry                                                                                                                          | Order Number     | (ISO)Number                          | Class            | Honing | Coated |        | Dimensions (inch)                                                                                                                                                             |      |      |      |      |      |      |      |
|                                                                                                                                                         |                  |                                      |                  |        | MP6120 | VP15TF | L                                                                                                                                                                             | LE   | S    | S10  | RE1  | RE2  | W1   |      |
| <div>VAS400</div> <div>Side Cutter</div> <div>☞L088</div> <div></div> | LNGU130804PNER-M | LNGU130804PNER-M                     | G                | E      | ●      |        | .512                                                                                                                                                                          | .480 | .315 | .433 | .016 | .031 | .315 |      |
|                                                                                                                                                         | LNGU130804PNEL-M | LNGU130804PNEL-M                     | G                | E      | ●      |        | .512                                                                                                                                                                          | .480 | .315 | .433 | .016 | .031 | .315 |      |
|                                                                                                                                                         | LNGU130808PNER-M | LNGU130808PNER-M                     | G                | E      | ●      |        | .512                                                                                                                                                                          | .480 | .315 | .433 | .031 | .031 | .315 |      |
|                                                                                                                                                         | LNGU130808PNEL-M | LNGU130808PNEL-M                     | G                | E      | ●      |        | .512                                                                                                                                                                          | .480 | .315 | .433 | .031 | .031 | .315 |      |
|                                                                                                                                                         | LNGU130812PNER-M | LNGU130812PNER-M                     | G                | E      | ●      |        | .512                                                                                                                                                                          | .480 | .315 | .433 | .047 | .031 | .315 |      |
|                                                                                                                                                         | LNGU130812PNEL-M | LNGU130812PNEL-M                     | G                | E      | ●      |        | .512                                                                                                                                                                          | .480 | .315 | .433 | .047 | .031 | .315 |      |
|                                                                                                                                                         | LNGU130816PNER-M | LNGU130816PNER-M                     | G                | E      | ●      |        | .512                                                                                                                                                                          | .480 | .315 | .433 | .063 | .031 | .315 |      |
|                                                                                                                                                         | LNGU130816PNEL-M | LNGU130816PNEL-M                     | G                | E      | ●      |        | .512                                                                                                                                                                          | .480 | .315 | .433 | .063 | .031 | .315 |      |
|                                                                                                                                                         | LNGU130820PNER-M | LNGU130820PNER-M                     | G                | E      | ●      |        | .512                                                                                                                                                                          | .480 | .315 | .433 | .079 | .031 | .315 |      |
|                                                                                                                                                         | LNGU130820PNEL-M | LNGU130820PNEL-M                     | G                | E      | ●      |        | .512                                                                                                                                                                          | .480 | .315 | .433 | .079 | .031 | .315 |      |
|                                                                                                                                                         | LNGU130824PNER-M | LNGU130824PNER-M                     | G                | E      | ●      |        | .512                                                                                                                                                                          | .480 | .315 | .433 | .094 | .031 | .315 |      |
|                                                                                                                                                         | LNGU130824PNEL-M | LNGU130824PNEL-M                     | G                | E      | ●      |        | .512                                                                                                                                                                          | .480 | .315 | .433 | .094 | .031 | .315 |      |
|                                                                                                                                                         | LNGU130830PNER-M | LNGU130830PNER-M                     | G                | E      | ●      |        | .512                                                                                                                                                                          | .449 | .315 | .433 | .118 | .063 | .315 |      |
|                                                                                                                                                         | LNGU130830PNEL-M | LNGU130830PNEL-M                     | G                | E      | ●      |        | .512                                                                                                                                                                          | .449 | .315 | .433 | .118 | .063 | .315 |      |
|                                                                                                                                                         | LNGU130840PNER-M | LNGU130840PNER-M                     | G                | E      | ●      |        | .512                                                                                                                                                                          | .449 | .315 | .433 | .157 | .063 | .315 |      |
|                                                                                                                                                         | LNGU130840PNEL-M | LNGU130840PNEL-M                     | G                | E      | ●      |        | .512                                                                                                                                                                          | .449 | .315 | .433 | .157 | .063 | .315 |      |
|                                                                                                                                                         | LNGU130850PNER-M | LNGU130850PNER-M                     | G                | E      | ●      |        | .512                                                                                                                                                                          | .449 | .315 | .433 | .197 | .063 | .315 |      |
|                                                                                                                                                         | LNGU130850PNEL-M | LNGU130850PNEL-M                     | G                | E      | ●      |        | .512                                                                                                                                                                          | .449 | .315 | .433 | .197 | .063 | .315 |      |
|                                                                                                                                                         | NEW              | LNGU130804PNER-R                     | LNGU130804PNER-R | G      | E      | ● ●    |                                                                                                                                                                               | .512 | .480 | .315 | .433 | .016 | .031 | .315 |
|                                                                                                                                                         | NEW              | LNGU130804PNEL-R                     | LNGU130804PNEL-R | G      | E      | ● ●    |                                                                                                                                                                               | .512 | .480 | .315 | .433 | .016 | .031 | .315 |
|                                                                                                                                                         | NEW              | LNGU130808PNER-R                     | LNGU130808PNER-R | G      | E      | ● ●    |                                                                                                                                                                               | .512 | .480 | .315 | .433 | .031 | .031 | .315 |
|                                                                                                                                                         | NEW              | LNGU130808PNEL-R                     | LNGU130808PNEL-R | G      | E      | ● ●    |                                                                                                                                                                               | .512 | .480 | .315 | .433 | .031 | .031 | .315 |
|                                                                                                                                                         | NEW              | LNGU130812PNER-R                     | LNGU130812PNER-R | G      | E      | ● ●    |                                                                                                                                                                               | .512 | .480 | .315 | .433 | .047 | .031 | .315 |
|                                                                                                                                                         | NEW              | LNGU130812PNEL-R                     | LNGU130812PNEL-R | G      | E      | ● ●    |                                                                                                                                                                               | .512 | .480 | .315 | .433 | .047 | .031 | .315 |
|                                                                                                                                                         | NEW              | LNGU130816PNER-R                     | LNGU130816PNER-R | G      | E      | ● ●    |                                                                                                                                                                               | .512 | .480 | .315 | .433 | .063 | .031 | .315 |
|                                                                                                                                                         | NEW              | LNGU130816PNEL-R                     | LNGU130816PNEL-R | G      | E      | ● ●    |                                                                                                                                                                               | .512 | .480 | .315 | .433 | .063 | .031 | .315 |
|                                                                                                                                                         | NEW              | LNGU130820PNER-R                     | LNGU130820PNER-R | G      | E      | ● ●    |                                                                                                                                                                               | .512 | .480 | .315 | .433 | .079 | .031 | .315 |
|                                                                                                                                                         | NEW              | LNGU130820PNEL-R                     | LNGU130820PNEL-R | G      | E      | ● ●    |                                                                                                                                                                               | .512 | .480 | .315 | .433 | .079 | .031 | .315 |
|                                                                                                                                                         | NEW              | LNGU130824PNER-R                     | LNGU130824PNER-R | G      | E      | ● ●    |                                                                                                                                                                               | .512 | .480 | .315 | .433 | .094 | .031 | .315 |
|                                                                                                                                                         | NEW              | LNGU130824PNEL-R                     | LNGU130824PNEL-R | G      | E      | ● ●    |                                                                                                                                                                               | .512 | .480 | .315 | .433 | .094 | .031 | .315 |
|                                                                                                                                                         | NEW              | LNGU130830PNER-R                     | LNGU130830PNER-R | G      | E      | ● ●    |                                                                                                                                                                               | .512 | .449 | .315 | .433 | .118 | .063 | .315 |
|                                                                                                                                                         | NEW              | LNGU130830PNEL-R                     | LNGU130830PNEL-R | G      | E      | ● ●    |                                                                                                                                                                               | .512 | .449 | .315 | .433 | .118 | .063 | .315 |
|                                                                                                                                                         | NEW              | LNGU130840PNER-R                     | LNGU130840PNER-R | G      | E      | ● ●    |                                                                                                                                                                               | .512 | .449 | .315 | .433 | .157 | .063 | .315 |
|                                                                                                                                                         | NEW              | LNGU130840PNEL-R                     | LNGU130840PNEL-R | G      | E      | ● ●    |                                                                                                                                                                               | .512 | .449 | .315 | .433 | .157 | .063 | .315 |
|                                                                                                                                                         | NEW              | LNGU130850PNER-R                     | LNGU130850PNER-R | G      | E      | ● ●    |                                                                                                                                                                               | .512 | .449 | .315 | .433 | .197 | .063 | .315 |
|                                                                                                                                                         | NEW              | LNGU130850PNEL-R                     | LNGU130850PNEL-R | G      | E      | ● ●    |                                                                                                                                                                               | .512 | .449 | .315 | .433 | .197 | .063 | .315 |

Right hand insert shown.



Right hand insert shown.

● = NEW

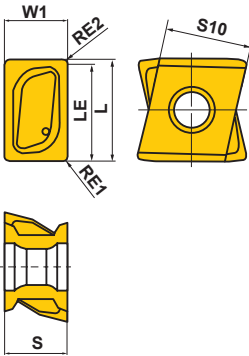
K

ROTATING TOOL INSERTS

# ROTATING INSERTS

| Work Material                         | P                | Steel                                | C     | C      |        | ✖      |                 | Cutting Conditions (Guide) :<br>● : Stable Cutting<br>● : General Cutting<br>✖ : Unstable Cutting<br><br>Honing :<br>E : Round |      |      |      |      |     |     |      |
|---------------------------------------|------------------|--------------------------------------|-------|--------|--------|--------|-----------------|--------------------------------------------------------------------------------------------------------------------------------|------|------|------|------|-----|-----|------|
|                                       | M                | Stainless Steel                      |       |        |        |        |                 |                                                                                                                                |      |      |      |      |     |     |      |
|                                       | K                | Cast Iron                            |       |        |        |        |                 |                                                                                                                                |      |      |      |      |     |     |      |
|                                       | N                | Non-ferrous Metal                    |       |        |        |        |                 |                                                                                                                                |      |      |      |      |     |     |      |
|                                       | S                | Heat-resistant Alloy, Titanium Alloy |       |        |        |        |                 |                                                                                                                                |      |      |      |      |     |     |      |
|                                       | H                | Hardened Steel                       |       |        |        |        |                 |                                                                                                                                |      |      |      |      |     |     |      |
| Cutter Type<br>Insert Geometry        | Order Number     | (ISO)Number                          | Class | Honing | Coated |        | Dimensions (mm) |                                                                                                                                |      |      |      |      |     |     |      |
|                                       |                  |                                      |       |        | MP6120 | VP15TF |                 |                                                                                                                                | L    | LE   | S    | S10  | RE1 | RE2 | W1   |
| <b>VAS500</b><br>Side Cutter<br>🔴L092 | LNGU171004PNER-R | LNGU171004PNER-R                     | G     | E      | ★      | ★      |                 |                                                                                                                                | 17.0 | 16.2 | 10.0 | 13.0 | 0.4 | 0.8 | 10.0 |
|                                       | LNGU171004PNEL-R | LNGU171004PNEL-R                     | G     | E      | ★      | ★      |                 |                                                                                                                                | 17.0 | 16.2 | 10.0 | 13.0 | 0.4 | 0.8 | 10.0 |
|                                       | LNGU171008PNER-R | LNGU171008PNER-R                     | G     | E      | ★      | ★      |                 |                                                                                                                                | 17.0 | 16.2 | 10.0 | 13.0 | 0.8 | 0.8 | 10.0 |
|                                       | LNGU171008PNEL-R | LNGU171008PNEL-R                     | G     | E      | ★      | ★      |                 |                                                                                                                                | 17.0 | 16.2 | 10.0 | 13.0 | 0.8 | 0.8 | 10.0 |
|                                       | LNGU171012PNER-R | LNGU171012PNER-R                     | G     | E      | ★      | ★      |                 |                                                                                                                                | 17.0 | 16.2 | 10.0 | 13.0 | 1.2 | 0.8 | 10.0 |
|                                       | LNGU171012PNEL-R | LNGU171012PNEL-R                     | G     | E      | ★      | ★      |                 |                                                                                                                                | 17.0 | 16.2 | 10.0 | 13.0 | 1.2 | 0.8 | 10.0 |
|                                       | LNGU171016PNER-R | LNGU171016PNER-R                     | G     | E      | ★      | ★      |                 |                                                                                                                                | 17.0 | 16.2 | 10.0 | 13.0 | 1.6 | 0.8 | 10.0 |
|                                       | LNGU171016PNEL-R | LNGU171016PNEL-R                     | G     | E      | ★      | ★      |                 |                                                                                                                                | 17.0 | 16.2 | 10.0 | 13.0 | 1.6 | 0.8 | 10.0 |
|                                       | LNGU171020PNER-R | LNGU171020PNER-R                     | G     | E      | ★      | ★      |                 |                                                                                                                                | 17.0 | 16.2 | 10.0 | 13.0 | 2.0 | 0.8 | 10.0 |
|                                       | LNGU171020PNEL-R | LNGU171020PNEL-R                     | G     | E      | ★      | ★      |                 |                                                                                                                                | 17.0 | 16.2 | 10.0 | 13.0 | 2.0 | 0.8 | 10.0 |
|                                       | LNGU171024PNER-R | LNGU171024PNER-R                     | G     | E      | ★      | ★      |                 |                                                                                                                                | 17.0 | 16.2 | 10.0 | 13.0 | 2.4 | 0.8 | 10.0 |
|                                       | LNGU171024PNEL-R | LNGU171024PNEL-R                     | G     | E      | ★      | ★      |                 |                                                                                                                                | 17.0 | 16.2 | 10.0 | 13.0 | 2.4 | 0.8 | 10.0 |
|                                       | LNGU171030PNER-R | LNGU171030PNER-R                     | G     | E      | ★      | ★      |                 |                                                                                                                                | 17.0 | 15.4 | 10.0 | 13.0 | 3.0 | 1.6 | 10.0 |
|                                       | LNGU171030PNEL-R | LNGU171030PNEL-R                     | G     | E      | ★      | ★      |                 |                                                                                                                                | 17.0 | 15.4 | 10.0 | 13.0 | 3.0 | 1.6 | 10.0 |
|                                       | LNGU171040PNER-R | LNGU171040PNER-R                     | G     | E      | ★      | ★      |                 |                                                                                                                                | 17.0 | 15.4 | 10.0 | 13.0 | 4.0 | 1.6 | 10.0 |
|                                       | LNGU171040PNEL-R | LNGU171040PNEL-R                     | G     | E      | ★      | ★      |                 |                                                                                                                                | 17.0 | 15.4 | 10.0 | 13.0 | 4.0 | 1.6 | 10.0 |
|                                       | LNGU171050PNER-R | LNGU171050PNER-R                     | G     | E      | ★      | ★      |                 |                                                                                                                                | 17.0 | 15.4 | 10.0 | 13.0 | 5.0 | 1.6 | 10.0 |
|                                       | LNGU171050PNEL-R | LNGU171050PNEL-R                     | G     | E      | ★      | ★      |                 |                                                                                                                                | 17.0 | 15.4 | 10.0 | 13.0 | 5.0 | 1.6 | 10.0 |
|                                       | LNGU171060PNER-R | LNGU171060PNER-R                     | G     | E      | ★      | ★      |                 |                                                                                                                                | 17.0 | 15.4 | 10.0 | 13.0 | 6.0 | 1.6 | 10.0 |
|                                       | LNGU171060PNEL-R | LNGU171060PNEL-R                     | G     | E      | ★      | ★      |                 |                                                                                                                                | 17.0 | 15.4 | 10.0 | 13.0 | 6.0 | 1.6 | 10.0 |
|                                       | LNGU171070PNER-R | LNGU171070PNER-R                     | G     | E      | ★      | ★      |                 |                                                                                                                                | 17.0 | 15.4 | 10.0 | 13.0 | 7.0 | 1.6 | 10.0 |
|                                       | LNGU171070PNEL-R | LNGU171070PNEL-R                     | G     | E      | ★      | ★      |                 |                                                                                                                                | 17.0 | 15.4 | 10.0 | 13.0 | 7.0 | 1.6 | 10.0 |

Right hand insert shown.



Right hand insert shown.

K

ROTATING TOOL INSERTS

[illegible]

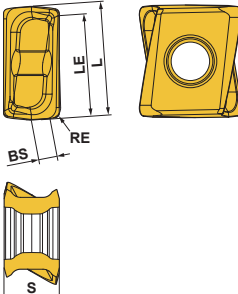
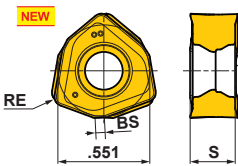
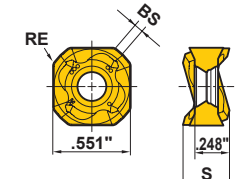
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## ROTATING TOOL INSERTS

# ROTATING INSERTS

## ROTATING TOOL INSERTS

● = NEW

| Work Material                                                                                                                                   | P                    | Steel                                |       |        |        |        |        |        |        |        |        |        | <div>Cutting Conditions (Guide) :</div> <div>● : Stable Cutting</div> <div>● : General Cutting</div> <div>✱ : Unstable Cutting</div> <div>Honing :</div> <div>E : Round F : Sharp</div> |        |        |         |                   |   |      |      |      |      |      |      |
|-------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------------------------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------|---------|-------------------|---|------|------|------|------|------|------|
|                                                                                                                                                 | M                    | Stainless Steel                      |       |        |        |        |        |        |        |        |        |        |                                                                                                                                                                                         |        |        |         |                   |   |      |      |      |      |      |      |
|                                                                                                                                                 | K                    | Cast Iron                            |       |        |        |        |        |        |        |        |        |        |                                                                                                                                                                                         |        |        |         |                   |   |      |      |      |      |      |      |
|                                                                                                                                                 | N                    | Non-Ferrous Metal                    |       |        |        |        |        |        |        |        |        |        |                                                                                                                                                                                         |        |        |         |                   |   |      |      |      |      |      |      |
|                                                                                                                                                 | S                    | Heat-resistant Alloy, Titanium Alloy |       |        |        |        |        |        |        |        |        |        |                                                                                                                                                                                         |        |        |         |                   |   |      |      |      |      |      |      |
|                                                                                                                                                 | H                    | Hardened Steel                       |       |        |        |        |        |        |        |        |        |        |                                                                                                                                                                                         |        |        |         |                   |   |      |      |      |      |      |      |
| Cutter Type<br>Insert Geometry                                                                                                                  | Order Number         | (ISO) Number                         | Class | Honing | Coated |        |        |        |        |        |        |        |                                                                                                                                                                                         |        | Cermet | Carbide | Dimensions (inch) |   |      |      |      |      |      |      |
|                                                                                                                                                 |                      |                                      |       |        | MC5020 | MC7020 | MP6120 | MP6130 | MP7130 | MP7140 | MP9120 | MP9130 | VP15TF                                                                                                                                                                                  | VP20RT | VP30RT | MX3030  | TF15              | L | LE   | S    | BS   | R    |      |      |
| <div>VPX300 ➡ L140</div> <div><div>NEW</div><div></div></div> | LOGU1207020PNER-M    | LOGU1207020PNER-M                    | G     | E      | ●      | ●      | ●      | ●      | ●      | ●      | ●      | ●      | ●                                                                                                                                                                                       | ●      |        |         |                   |   | .488 | .445 | .276 | .118 | .008 |      |
|                                                                                                                                                 | LOGU1207040PNER-M    | LOGU1207040PNER-M                    | G     | E      | ●      | ●      | ●      | ●      | ●      | ●      | ●      | ●      | ●                                                                                                                                                                                       | ●      | ●      |         |                   |   |      | .488 | .445 | .276 | .110 | .016 |
|                                                                                                                                                 | LOGU1207080PNER-M    | LOGU1207080PNER-M                    | G     | E      | ●      | ●      | ●      | ●      | ●      | ●      | ●      | ●      | ●                                                                                                                                                                                       | ●      | ●      |         |                   |   |      | .488 | .445 | .276 | .094 | .031 |
|                                                                                                                                                 | LOGU1207100PNER-M    | LOGU1207100PNER-M                    | G     | E      | ●      | ●      | ●      | ●      | ●      | ●      | ●      | ●      | ●                                                                                                                                                                                       | ●      | ●      |         |                   |   |      | .488 | .445 | .276 | .091 | .039 |
|                                                                                                                                                 | LOGU1207120PNER-M    | LOGU1207120PNER-M                    | G     | E      | ●      | ●      | ●      | ●      | ●      | ●      | ●      | ●      | ●                                                                                                                                                                                       | ●      | ●      |         |                   |   |      | .488 | .445 | .276 | .083 | .047 |
|                                                                                                                                                 | LOGU1207160PNER-M    | LOGU1207160PNER-M                    | G     | E      | ●      | ●      | ●      | ●      | ●      | ●      | ●      | ●      | ●                                                                                                                                                                                       | ●      | ●      |         |                   |   |      | .488 | .445 | .276 | .067 | .063 |
|                                                                                                                                                 | LOGU1207200PNER-M    | LOGU1207200PNER-M                    | G     | E      | ●      | ●      | ●      | ●      | ●      | ●      | ●      | ●      | ●                                                                                                                                                                                       | ●      | ●      |         |                   |   |      | .488 | .445 | .276 | .055 | .079 |
|                                                                                                                                                 | LOGU1207240PNER-M    | LOGU1207240PNER-M                    | G     | E      | ●      | ●      | ●      | ●      | ●      | ●      | ●      | ●      | ●                                                                                                                                                                                       | ●      | ●      |         |                   |   |      | .488 | .445 | .276 | .039 | .094 |
|                                                                                                                                                 | LOGU1207300PNER-M    | LOGU1207300PNER-M                    | G     | E      | ●      | ●      | ●      | ●      | ●      | ●      | ●      | ●      | ●                                                                                                                                                                                       | ●      | ●      |         |                   |   |      | .488 | .445 | .276 | .020 | .118 |
|                                                                                                                                                 | LOGU1207320PNER-M    | LOGU1207320PNER-M                    | G     | E      | ●      | ●      | ●      | ●      | ●      | ●      | ●      | ●      | ●                                                                                                                                                                                       | ●      | ●      |         |                   |   |      | .488 | .445 | .276 | .012 | .126 |
|                                                                                                                                                 | LOGU1207020PNFR-M    | LOGU1207020PNFR-M                    | G     | F      |        |        |        |        |        |        |        |        |                                                                                                                                                                                         |        |        |         | ●                 |   | .488 | .445 | .276 | .118 | .008 |      |
|                                                                                                                                                 | LOGU1207040PNFR-M    | LOGU1207040PNFR-M                    | G     | F      |        |        |        |        |        |        |        |        |                                                                                                                                                                                         |        |        |         | ●                 |   | .488 | .445 | .276 | .110 | .016 |      |
|                                                                                                                                                 | LOGU1207080PNFR-M    | LOGU1207080PNFR-M                    | G     | F      |        |        |        |        |        |        |        |        |                                                                                                                                                                                         |        |        |         | ●                 |   | .488 | .445 | .276 | .094 | .031 |      |
|                                                                                                                                                 | LOGU1207100PNFR-M    | LOGU1207100PNFR-M                    | G     | F      |        |        |        |        |        |        |        |        |                                                                                                                                                                                         |        |        |         | ●                 |   | .488 | .445 | .276 | .091 | .039 |      |
|                                                                                                                                                 | LOGU1207120PNFR-M    | LOGU1207120PNFR-M                    | G     | F      |        |        |        |        |        |        |        |        |                                                                                                                                                                                         |        |        |         | ●                 |   | .488 | .445 | .276 | .083 | .047 |      |
|                                                                                                                                                 | LOGU1207160PNFR-M    | LOGU1207160PNFR-M                    | G     | F      |        |        |        |        |        |        |        |        |                                                                                                                                                                                         |        |        |         | ●                 |   | .488 | .445 | .276 | .067 | .063 |      |
|                                                                                                                                                 | LOGU1207200PNFR-M    | LOGU1207200PNFR-M                    | G     | F      |        |        |        |        |        |        |        |        |                                                                                                                                                                                         |        |        |         | ●                 |   | .488 | .445 | .276 | .055 | .079 |      |
|                                                                                                                                                 | LOGU1207240PNFR-M    | LOGU1207240PNFR-M                    | G     | F      |        |        |        |        |        |        |        |        |                                                                                                                                                                                         |        |        |         | ●                 |   | .488 | .445 | .276 | .039 | .094 |      |
|                                                                                                                                                 | LOGU1207300PNFR-M    | LOGU1207300PNFR-M                    | G     | F      |        |        |        |        |        |        |        |        |                                                                                                                                                                                         |        |        |         | ●                 |   | .488 | .445 | .276 | .020 | .118 |      |
|                                                                                                                                                 | LOGU1207320PNFR-M    | LOGU1207320PNFR-M                    | G     | F      |        |        |        |        |        |        |        |        |                                                                                                                                                                                         |        |        |         | ●                 |   | .488 | .445 | .276 | .012 | .126 |      |
| Right hand insert only.                                                                                                                         |                      |                                      |       |        |        |        |        |        |        |        |        |        |                                                                                                                                                                                         |        |        |         |                   |   |      |      |      |      |      |      |
| <div>WJX ➡ L224</div> <div><div>NEW</div><div></div></div>   | JOMU140715ZZER-L     | JOMU140715ZZER-L                     | M     | E      | ●      | ●      | ●      | ●      | ●      | ●      | ●      | ●      | ●                                                                                                                                                                                       | ●      | ●      |         |                   | — | —    | .259 | .051 | .059 |      |      |
|                                                                                                                                                 | JOMU140715ZZER-M     | JOMU140715ZZER-M                     | M     | E      | ●      | ●      | ●      | ●      | ●      | ●      | ●      | ●      | ●                                                                                                                                                                                       | ●      | ●      | ●       |                   |   | —    | —    | .261 | .051 | .059 |      |
|                                                                                                                                                 | JOMU140715ZZER-R     | JOMU140715ZZER-R                     | M     | E      | ●      | ●      | ●      |        |        |        |        | ●      | ●                                                                                                                                                                                       | ●      | ●      |         |                   | — | —    | .266 | .051 | .059 |      |      |
|                                                                                                                                                 |                      |                                      |       |        |        |        |        |        |        |        |        |        |                                                                                                                                                                                         |        |        |         |                   |   |      |      |      |      |      |      |
| Right hand insert only.                                                                                                                         |                      |                                      |       |        |        |        |        |        |        |        |        |        |                                                                                                                                                                                         |        |        |         |                   |   |      |      |      |      |      |      |
| <div>WSX445 ➡ L018</div> <div></div>                         | SNGU140812ANFR-L     | SNGU140812ANFR-L                     | G     | F      |        |        |        |        |        |        |        |        |                                                                                                                                                                                         |        |        | ●       |                   | — | —    | .331 | .059 | .047 |      |      |
|                                                                                                                                                 | SNGU140812ANER-L     | SNGU140812ANER-L                     | G     | E      | ●      | ●      | ●      | ●      | ●      | ●      | ●      | ●      | ●                                                                                                                                                                                       | ●      | ●      | ●       |                   |   | —    | —    | .331 | .059 | .047 |      |
|                                                                                                                                                 | SNGU140812ANER-M     | SNGU140812ANER-M                     | G     | E      | ●      | ●      | ●      | ●      | ●      | ●      | ●      | ●      | ●                                                                                                                                                                                       | ●      | ●      | ●       |                   |   | —    | —    | .331 | .059 | .047 |      |
|                                                                                                                                                 | SNMU140812ANER-M     | SNMU140812ANER-M                     | M     | E      | ●      | ●      | ●      | ●      | ●      | ●      | ●      | ●      | ●                                                                                                                                                                                       | ●      | ●      | ●       |                   |   | —    | —    | .331 | .059 | .047 |      |
|                                                                                                                                                 | SNMU140812ANER-R     | SNMU140812ANER-R                     | M     | E      | ●      | ●      | ●      |        |        |        |        | ●      | ●                                                                                                                                                                                       | ●      | ●      |         |                   | — | —    | .331 | .059 | .047 |      |      |
|                                                                                                                                                 | SNMU140812ANER-H     | SNMU140812ANER-H                     | M     | E      | ●      | ●      | ●      |        |        |        |        | ●      | ●                                                                                                                                                                                       | ●      | ●      |         |                   | — | —    | .331 | .059 | .047 |      |      |
|                                                                                                                                                 | NEW SNGU140812ANFL-L | SNGU140812ANFL-L                     | G     | F      |        |        |        |        |        |        |        |        |                                                                                                                                                                                         |        |        | ●       |                   | — | —    | .331 | .059 | .047 |      |      |
|                                                                                                                                                 | NEW SNGU140812ANEL-L | SNGU140812ANEL-L                     | G     | E      | ●      | ●      | ●      |        |        |        |        | ●      | ●                                                                                                                                                                                       | ●      | ●      |         |                   | — | —    | .331 | .059 | .047 |      |      |
|                                                                                                                                                 | SNGU140812ANEL-M     | SNGU140812ANEL-M                     | G     | E      | ●      | ●      | ●      |        |        |        |        | ●      | ●                                                                                                                                                                                       | ●      | ●      |         |                   | — | —    | .331 | .059 | .047 |      |      |
|                                                                                                                                                 | SNMU140812ANEL-M     | SNMU140812ANEL-M                     | M     | E      | ●      | ●      | ●      |        |        |        |        | ●      | ●                                                                                                                                                                                       | ●      | ●      |         |                   | — | —    | .331 | .059 | .047 |      |      |
|                                                                                                                                                 | SNMU140812ANEL-R     | SNMU140812ANEL-R                     | M     | E      | ●      | ●      | ●      |        |        |        |        | ●      | ●                                                                                                                                                                                       | ●      | ●      |         |                   | — | —    | .331 | .059 | .047 |      |      |

● = NEW

# ROTATING INSERTS

## ROTATING TOOL INSERTS

● = NEW

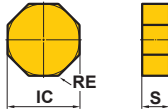
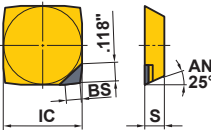
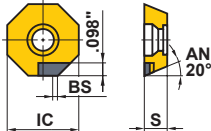
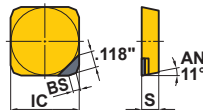
**K048**

K

\*2 Grade HTi10 has "F" honing, grade NX2525 has "T" honing.

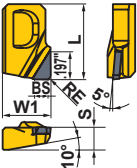
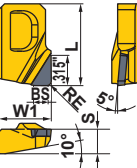
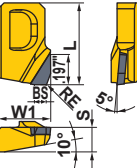
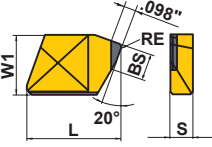
## ROTATING TOOL INSERTS

# CBN AND PCD

| Work Material                                                                       | K Cast Iron      |                   | ● ● ● |                                             |     |                   |    |      |      |      |      |
|-------------------------------------------------------------------------------------|------------------|-------------------|-------|---------------------------------------------|-----|-------------------|----|------|------|------|------|
|                                                                                     | N                | Non-Ferrous Metal |       |                                             | ● ● |                   |    |      |      |      |      |
| Cutter Type<br>Insert Geometry                                                      | Order Number     | (ISO) Number      | Class | CBN                                         | PCD | Dimensions (inch) |    |      |      |      |      |
|                                                                                     |                  |                   |       | MB710<br>MB730<br>BC5030<br>MD220<br>MD2030 |     | L                 | W1 | IC   | S    | BS   | RE   |
| AOX445 Ⓡ L069                                                                       | SL-ONEN120404ASN | SL-ONEN120404ASN  | E     | ★                                           |     | —                 | —  | .500 | .187 | —    | .016 |
|    |                  |                   |       |                                             |     |                   |    |      |      |      |      |
| BF407                                                                               | SFCN42ZFFR2      | SFCN1203ZFFR2     | C     |                                             | ●   | —                 | —  | .500 | .125 | .094 | —    |
|    |                  |                   |       |                                             |     |                   |    |      |      |      |      |
| BOE Ⓡ L256                                                                          | OEMX12T3ETR1     | OEMX12T3ETR1      | M     | ●                                           |     | —                 | —  | .500 | .156 | .039 | —    |
|                                                                                     | OEMX12T3ETR5     | OEMX12T3ETR5      | M     | ●                                           |     | —                 | —  | .500 | .156 | .197 | —    |
|   |                  |                   |       |                                             |     |                   |    |      |      |      |      |
| FBP415                                                                              | SPEN42EETR1      | SPEN1203EETR1     | E     | ★                                           |     | —                 | —  | .500 | .125 | .055 | —    |
|  |                  |                   |       |                                             |     |                   |    |      |      |      |      |

K

ROTATING TOOL INSERTS

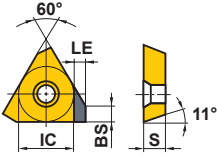
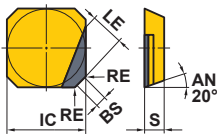
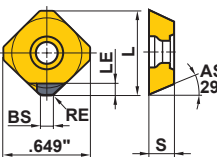
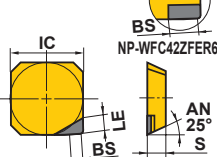
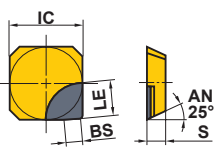
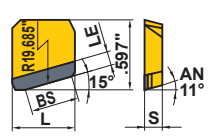
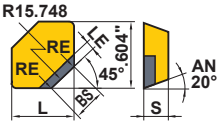
| Work Material                                                                                                                                                                       | K                       | Cast Iron         |       |                          |                 |                                                                                     |                                                                                     |                   |      |    |      |      |      |  |  |  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|-------------------|-------|--------------------------|-----------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------|------|----|------|------|------|--|--|--|
|                                                                                                                                                                                     | N                       | Non-Ferrous Metal |       |                          |                 |                                                                                     |                                                                                     |                   |      |    |      |      |      |  |  |  |
| Cutter Type<br>Insert Geometry                                                                                                                                                      | Order Number            | (ISO) Number      | Class | CBN                      |                 | PCD                                                                                 |                                                                                     | Dimensions (inch) |      |    |      |      |      |  |  |  |
|                                                                                                                                                                                     |                         |                   |       | MB710<br>MB730<br>BC5030 | MD220<br>MD2030 | L                                                                                   | W1                                                                                  | IC                | S    | BS | RE   |      |      |  |  |  |
| <b>FMAX </b><br>  | <b>GOER1404PXFR2</b>    | GOER1404PXFR2     | E     |                          |                 |  |  | .551              | .354 | —  | .165 | .079 | .016 |  |  |  |
|                                                                                                                                                                                     | <b>GOER1408PXFR2</b>    | GOER1408PXFR2     | E     |                          |                 |  |  | .551              | .354 | —  | .165 | .079 | .031 |  |  |  |
|                                                                                                                                                                                     |                         |                   |       |                          |                 |                                                                                     |                                                                                     |                   |      |    |      |      |      |  |  |  |
| <b>FMAX </b><br>  | <b>GOER1408PXFR2-8</b>  | GOER1408PXFR2-8   | E     |                          |                 |  |                                                                                     | .551              | .354 | —  | .165 | .079 | .031 |  |  |  |
|                                                                                                                                                                                     |                         |                   |       |                          |                 |                                                                                     |                                                                                     |                   |      |    |      |      |      |  |  |  |
| <b>FMAX </b><br> | <b>GOER1401ZXFR2</b>    | GOER1401ZXFR2     | E     |                          |                 |  |                                                                                     | .551              | .354 | —  | .165 | .079 | .004 |  |  |  |
|                                                                                                                                                                                     |                         |                   |       |                          |                 |                                                                                     |                                                                                     |                   |      |    |      |      |      |  |  |  |
| <b>NF10000</b><br>                                                                               | <b>NP-GDCN2004PDSR3</b> | NP-GDCN2004PDSR3  | C     | ★                        |                 |                                                                                     |                                                                                     | .787              | .500 | —  | .187 | —    | .031 |  |  |  |
|                                                                                                                                                                                     |                         |                   |       |                          |                 |                                                                                     |                                                                                     |                   |      |    |      |      |      |  |  |  |

● = NEW

K

ROTATING TOOL INSERTS

# CBN AND PCD WITH WIPER

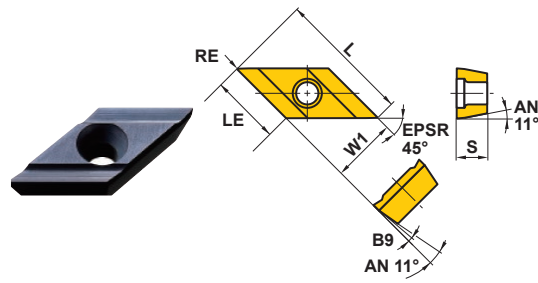
| Work Material                                                                                                              | K                        | Cast Iron         |       |                         |     |                   |      |      |      |      |      |  |
|----------------------------------------------------------------------------------------------------------------------------|--------------------------|-------------------|-------|-------------------------|-----|-------------------|------|------|------|------|------|--|
|                                                                                                                            | N                        | Non-Ferrous Metal |       |                         |     |                   |      |      |      |      |      |  |
| Cutter Type<br>Insert Geometry                                                                                             | Order Number             | (ISO) Number      | Class | CBN                     | PCD | Dimensions (inch) |      |      |      |      |      |  |
|                                                                                                                            |                          |                   |       | MB710<br>MB730<br>MD220 |     | L                 | IC   | LE   | S    | BS   | RE   |  |
| <b>PMF <math>\odot</math>L290</b><br>     | <b>TPEW1303ZPTR2</b>     | TPEW1303ZPTR2     | E     | ●                       |     | —                 | .313 | .059 | .125 | .079 | —    |  |
|                                                                                                                            |                          |                   |       |                         |     |                   |      |      |      |      |      |  |
| <b>SE445</b><br>                          | <b>SECN42AFFR1</b>       | SECN1203AFFR1     | C     |                         | ●   | —                 | .500 | .197 | .125 | .055 | .039 |  |
|                                                                                                                            |                          |                   |       |                         |     |                   |      |      |      |      |      |  |
| <b>ASX445 <math>\odot</math>L030</b><br> | <b>NP-WEEW13T3AGFR3C</b> | NP-WEEW13T3AGFR3C | E     |                         | ●   | .654              | —    | .071 | .156 | .118 | .059 |  |
|                                                                                                                            | <b>NP-WEEW13T3AGTR3C</b> | NP-WEEW13T3AGTR3C | E     | ●                       |     | .654              | —    | .071 | .156 | .118 | .059 |  |
| <b>BF407</b><br>                        | <b>NP-WFC42ZFER2</b>     | NP-WFC42ZFER2     | C     |                         | ●   | —                 | .500 | .118 | .125 | .094 | —    |  |
|                                                                                                                            | <b>NP-WFC42ZFER6</b>     | NP-WFC42ZFER6     | C     |                         | ●   | —                 | .500 | .130 | .125 | .236 | —    |  |
| <b>BF407</b><br>                        | <b>WFC42ZFER2</b>        | WFC42ZFER2        | C     |                         | ★   | —                 | .500 | .244 | .125 | .094 | —    |  |
|                                                                                                                            |                          |                   |       |                         |     |                   |      |      |      |      |      |  |
| <b>FBP415</b><br>                       | <b>WPC42EETR10C</b>      | WPC42EETR10C      | C     | ●                       |     | .500              | —    | .098 | .125 | .394 | —    |  |
|                                                                                                                            |                          |                   |       |                         |     |                   |      |      |      |      |      |  |
| <b>SE445</b><br>R15.748<br>             | <b>WEC42AFFR5C</b>       | WEC42AFFR5C       | C     |                         | ●   | .500              | —    | .087 | .125 | .197 | .039 |  |
|                                                                                                                            | <b>WEC42AFTR5C</b>       | WEC42AFTR5C       | C     | ●                       |     | .500              | —    | .087 | .125 | .197 | .039 |  |

K

ROTATING TOOL INSERTS

# DRILLING INSERTS

## Insert for TAW Drill Chamfering Module

| Shape<br>Geometry                                                                 | Order Number    | Coated |  | Dimensions (mm) |      |     |      |     |    |
|-----------------------------------------------------------------------------------|-----------------|--------|--|-----------------|------|-----|------|-----|----|
|                                                                                   |                 | VP15TF |  | L               | LE   | WI  | S    | RE  | B9 |
|  | TAWC12T301-45GM | ★      |  | 17.4            | 9.05 | 8.5 | 3.97 | 0.1 | 5° |
|                                                                                   |                 |        |  |                 |      |     |      |     |    |