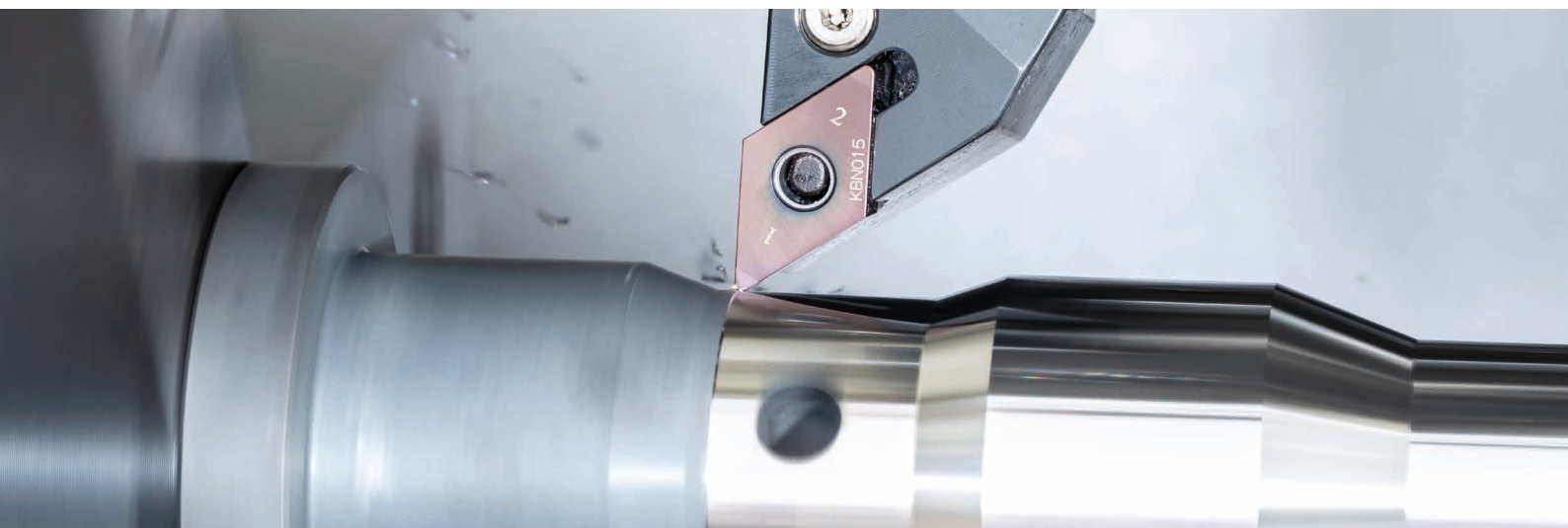


New Coated CBN for Machining Hardened Material

# KBN015

**NEW**



**"Wear Resistance + Fracture Resistance" Lowers Costs when Machining Hardened Material**

1st recommended grade for general purpose machining of high hardness material

Supports high speed, continuous to interrupted machining

Newly developed "MEGACOAT TOUGH" Coating technology

Three grades for a variety of hardened material options

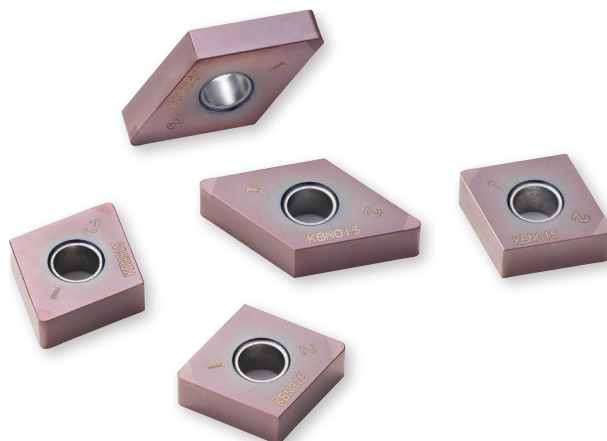
KBN010 / KBN015 / KBN020

**NEW**

New Coating is Now Available



**MEGACOAT  
TOUGH** | CBN |



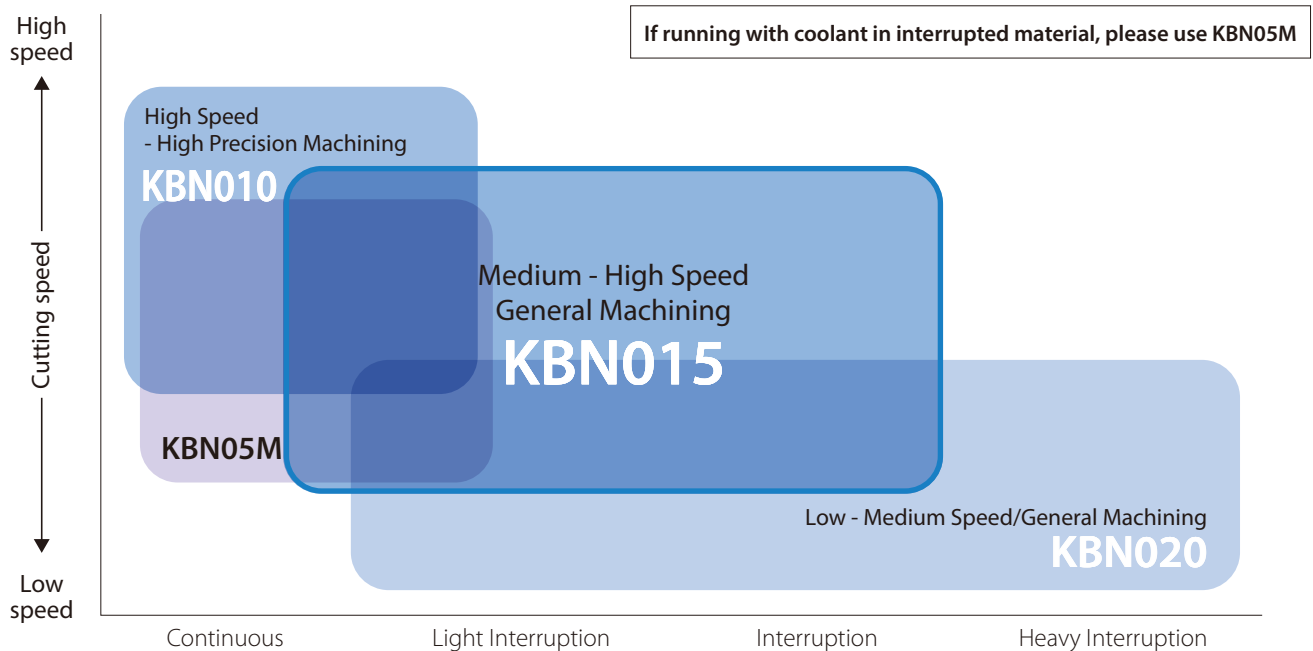
# KBN015

1st recommended grade for general purpose machining of high hardness material.

"Wear resistance + Fracture resistance" lowers costs when machining hardened material.

1

**KBN015 : 1st recommended grade for general purpose machining of high hardness material**



## KBN015

1st recommended grade of high hardness material

Available for a wide range of machining applications from continuous to interrupted machining to high speed machining



- New CBN maintains heat resistance and fracture resistance
- "MEGACOAT TOUGH" Coating technology
- Special multi-layer improves wear resistance

## KBN010



High speed, high-precision machining

- Mixed structure of micro grain CBN and coarse grain CBN
- Excellent heat resistance and surface quality
- "MEGACOAT TOUGH" Coating technology

## KBN020



Good for heavily interrupted machining

- High content CBN with high purity TiN binder
- High fracture resistance
- "MEGACOAT TOUGH" Coating technology

## Case Studies

### Gear SCM420H 58-60HRC

#### Continuous Facing

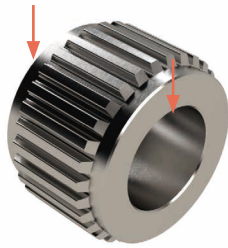
Vc = 180 m/min

ap = 0.2 mm

f = 0.1 mm/rev

Wet

CNGA120408S01225MEW



#### Tool Life

**KBN015** 2,000 pcs/edge

1.3×

Competitor A 1,500 pcs/edge

KBN015 showed good cutting edge condition and maintains long tool life.

(User evaluation)

### Outer Race S55C 62HRC

#### Internal Interrupted Turning

Vc = 160 m/min

ap = 0.2 mm

f = 0.17 mm/rev

Dry

TNGA160412S00545



#### Tool Life

**KBN015** 500 pcs/edge

1.6×

Competitor B 300 pcs/edge

KBN015 is resistant to chipping and maintains extended long tool life.

(User evaluation)

### Gear SNCM220<sup>®</sup> 58HRC

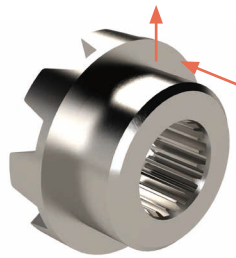
Vc = 125 m/min

ap = 0.25 mm

f = 0.1 mm/rev

Dry

CNGA120408S04030MEH



#### Tool Life

**KBN010** 600 pcs/edge

3.0×

Competitor C 200 pcs/edge

KBN010 provides longer tool life than competitor D.

(User evaluation)

### Roll SKD11 62HRC

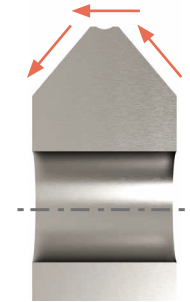
Vc = 145 m/min

ap = 0.25-0.50 mm

f = 0.1 mm/rev

Dry

DNGA150608S01225



#### Tool Life

**KBN010** 18 pcs/edge

1.3×

Competitor D 13 pcs/edge

Achieved longer tool life with excellent wear resistance in continuous machining of hardened material.

(User evaluation)

### Clutch SCr420H

Vc = 100 m/min

ap = 0.15 mm

f = 0.1 mm/rev

Wet

WNGA080408S01225



#### Tool Life

**KBN020** 650 pcs/edge

1.6×

Competitor E 400 pcs/edge

KBN020 provides stable machining with longer tool life.

(User evaluation)

### Gear SCM415

Vc = 100 m/min

ap = 0.05 mm

f = 0.15 mm/rev

Wet

CNGA120408S01325MEW



#### Tool Life

**KBN020** 300 pcs/edge

1.5×

Competitor F 200 pcs/edge

KBN020 improves dimensional variation with longer tool life.

(User evaluation)

2

## "MEGACOAT TOUGH" and new CBN provide both wear resistance and Fracture Resistance



**MEGACOAT  
TOUGH** | CBN |



"MEGACOAT TOUGH" coating with newly developed CBN dedicated high adhesion layer  
High adhesion suppresses delamination for long tool life and stable machining



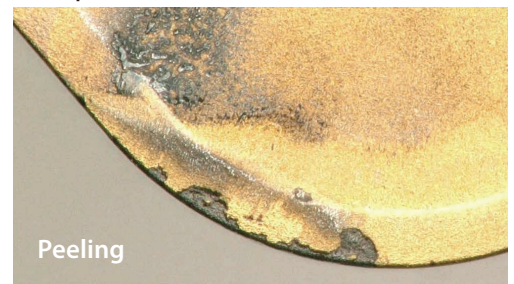
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**Cutting edge condition after machining** (Internal evaluation)

**KBN015**



**Competitor G**



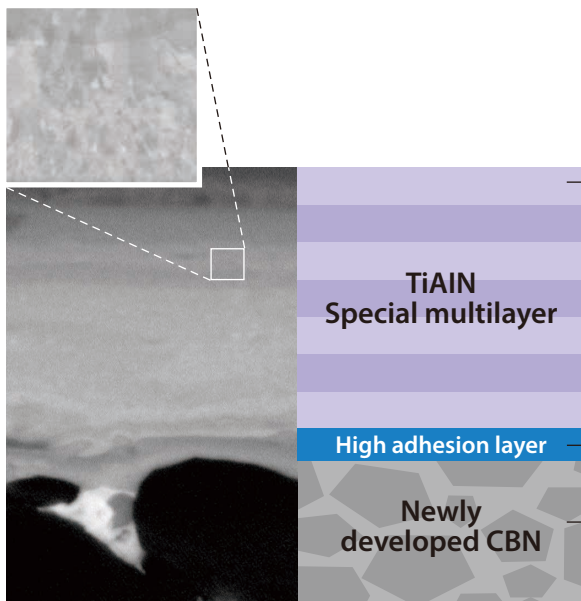
Cutting Conditions :  $V_c = 150$  m/min,  $a_p = 0.2$  mm,  $f = 0.2$  mm/rev, Dry SCM415® HRC61

Intermediate layer and high adhesion layer for decreased stress improve adhesion with CBN

Medium - High Speed/General Machining **KBN015**

"MEGACOAT TOUGH" and New CBN substrate for Long Tool Life and Stable Machining

Micronized film structure

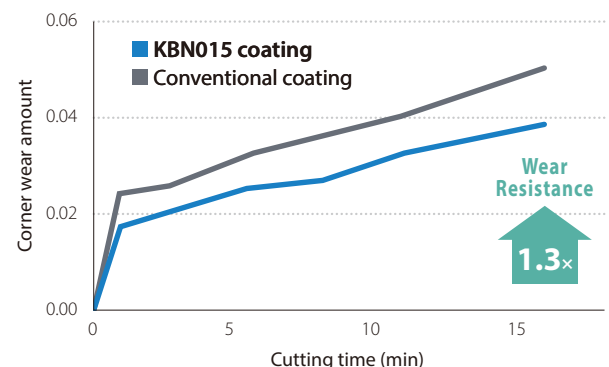


< Layer image >

### Wear resistance layer

- Improved heat resistance by optimizing film composition
- Improved hardness and toughness with atomization

**Wear resistance comparison** (Internal evaluation)



Cutting Conditions :  $V_c = 150$  m/min,  $f = 0.1$  mm/rev,  $a_p = 0.2$  mm Wet SCM420 (H)

**"MEGACOAT TOUGH" unique technology**  
Suppresses delamination with high adhesion

**Balanced CBN with heat resistance and fracture resistance**

- High purity and tough CBN abrasive grain
- Fine ceramic binder improves heat resistance and fracture resistance

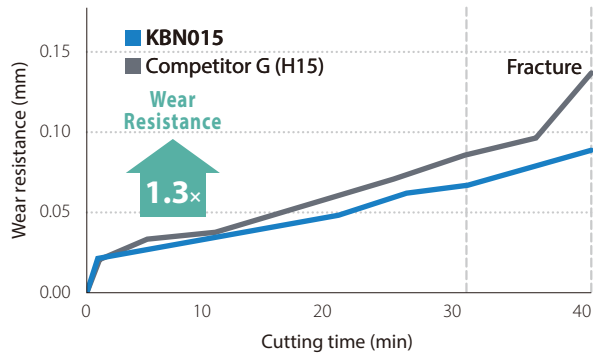
## Cutting Performance

Excellent balance of abrasion resistance and fracture resistance, long tool life and stable machining

Medium Speed Machining Evaluation ( $V_c=150\text{m/min}$ )

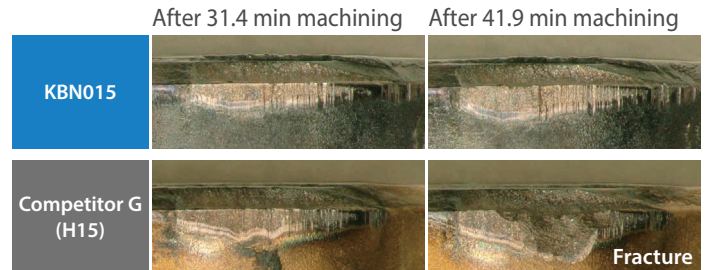
KBN015 has 1.3 times higher wear resistance of competitor G (H15) of the same grade.

**Wear resistance comparison** (Internal evaluation)



Cutting Conditions :  $V_c = 150 \text{ m/min}$ ,  $f = 0.1 \text{ mm/rev}$ ,  $a_p = 0.2 \text{ mm}$  Wet SCM415®

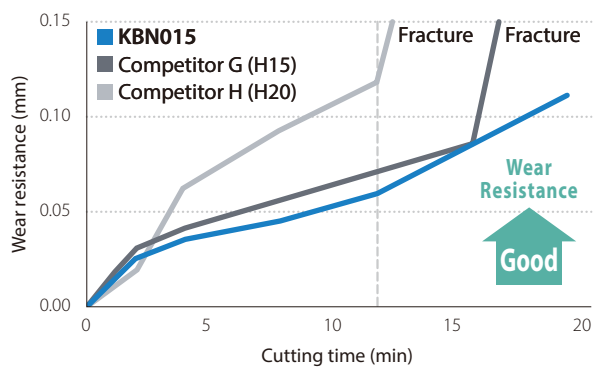
**Edge condition**



High Speed Machining Evaluation ( $V_c=200\text{m/min}$ )

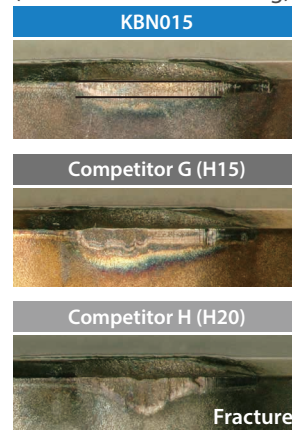
KBN015 has excellent wear resistance and fracture resistance compared to competitor's H15 and H20 grades.

**Wear resistance comparison** (Internal evaluation)



Cutting Conditions :  $V_c = 200 \text{ m/min}$ ,  $f = 0.1 \text{ mm/rev}$ ,  $a_p = 0.2 \text{ mm}$  Wet SCM415®

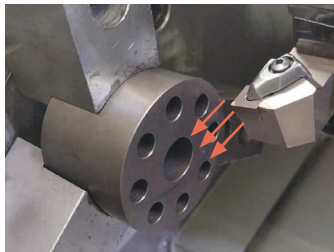
**Edge condition**  
(after 11.5 min machining)



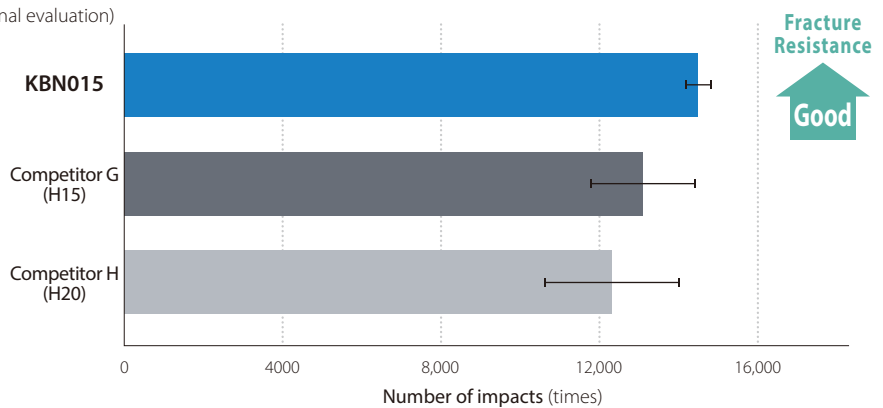
Interrupted machining evaluation

KBN015 is resistant to chipping and has high stability compared to competitor's H15 and H20 grades.

**Fracture resistance comparison** (Internal evaluation)

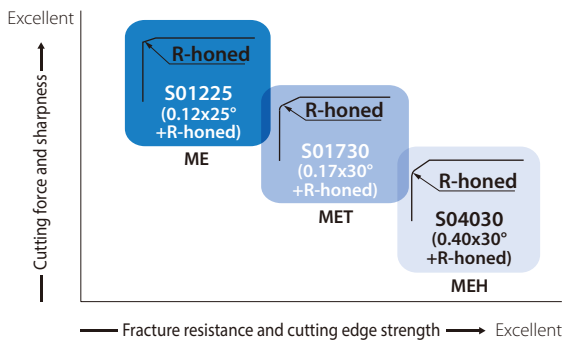


Cutting Conditions :  $V_c = 150 \text{ m/min}$   
 $f = 0.2 \text{ mm/rev}$ ,  $a_p = 0.2 \text{ mm}$  Dry  
SCM415®

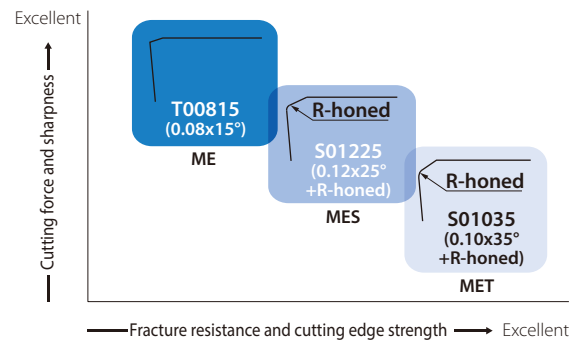




## Negative Insert



## Positive Insert

Negative Insert Standard Cutting Edge Prep.  
(Hardened material machining)

| Symbol | Cutting Edge Prep. |                       | Applications and Features                                 |
|--------|--------------------|-----------------------|-----------------------------------------------------------|
| ME     | S01225             | 0.12mm x 25° +R-honed | General purpose                                           |
| MET    | S01730             | 0.17mm x 30° +R-honed | Superior fracture resistance                              |
| MEH    | S04030             | 0.40mm x 30° +R-honed | For interrupted - high-feed machining<br>Prevents flaking |

Positive Insert Standard Cutting Edge Prep.  
(Hardened material machining)

| Symbol | Cutting Edge Prep. |                       | Applications and Features               |
|--------|--------------------|-----------------------|-----------------------------------------|
| ME     | T00815             | 0.08mm x 15°          | Chamfered Sharp edge,<br>Minimize burrs |
| MES    | S01225             | 0.12mm x 25° +R-honed | General purpose                         |
| MET    | S01035             | 0.10mm x 35° +R-honed | For interruption<br>Stable machining    |

## Recommended Cutting Conditions

| Workpiece Material |               | Recommended Insert Grade |                                    | Application                    | Cutting Conditions    |                           |                           |
|--------------------|---------------|--------------------------|------------------------------------|--------------------------------|-----------------------|---------------------------|---------------------------|
|                    |               |                          |                                    |                                | Vc (m/min)            | ap (mm)                   | f (mm/rev)                |
| Hard Materials     | 55HRC or more | KBN010                   | High Precision Machining Finishing | Continuous                     | 80 - <b>180</b> - 250 | 0.05 - <b>0.20</b> - 0.35 | 0.05 - <b>0.15</b> - 0.30 |
|                    |               | KBN015                   | High speed/ General                | Continuous~ Interruption       | 80 - <b>180</b> - 230 | 0.05 - <b>0.20</b> - 0.50 | 0.05 - <b>0.20</b> - 0.45 |
|                    |               | KBN020                   | Low speed/ General                 | Continuous~ Heavy Interruption | 80 - <b>120</b> - 200 | 0.05 - <b>0.20</b> - 0.50 | 0.05 - <b>0.20</b> - 0.45 |

# Solution for Automotive Parts

## KBN010 / KBN015 / KBN020

### Solution 1

Available for continuous to interrupted/heavy interrupted machining  
Can be used on a variety of part shapes such as machining shafts and gears.

#### Point

Excellent machining performance of auto suspension parts that use a lot of hardened materials

### Solution 2

Long tool life and stable machining. High toughness suppresses sudden fractures during continuous to interrupted machining applications.

#### Point

Stable machining increases productivity



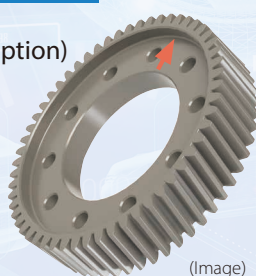
#### Sun Gear

Boring finishing for spline part (Interruption)



#### Diff Ring

Facing (Interruption)



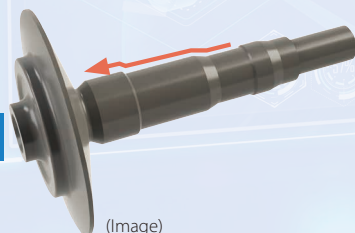
#### Pinion Gear

External finishing



#### CVT Shaft

External finishing

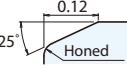


#### Side Gear

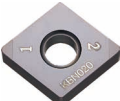
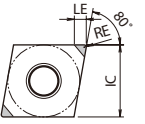
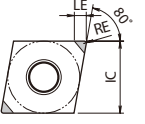
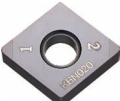
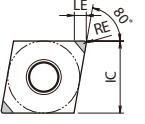
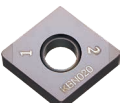
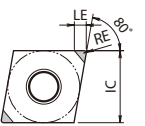
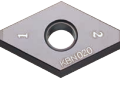
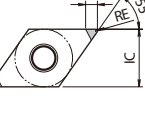
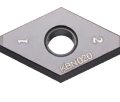
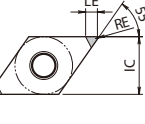
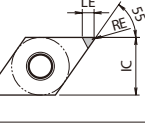
Boring finishing for spline part (Interruption)



## Standard Stock (Negative)

| Cutting Edge Preparation |                            |                                          |                                                                                   |
|--------------------------|----------------------------|------------------------------------------|-----------------------------------------------------------------------------------|
| Symbol                   | Cutting Edge Specification | Indication Example                       | Shape                                                                             |
| S                        | Chamfered and Honed        | S01225 0.12 mm x 25° chamfered and honed |  |

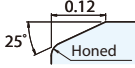
| Description | IC    | S    | D1   |
|-------------|-------|------|------|
| CNGA 1204_  | 12.70 | 4.76 | 5.16 |
| DNGA 1504_  | 12.70 | 4.76 | 5.16 |
| DNGA 1506_  |       | 6.35 |      |

| Shape                                                                               |                                                                                     | Description          | Cutting Edge Preparation | Dimensions (mm) |     | No. of Edges | MEGACOAT TOUGH |        |        |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|----------------------|--------------------------|-----------------|-----|--------------|----------------|--------|--------|
|                                                                                     |                                                                                     |                      |                          | RE              | LE  |              | KBN015         | KBN010 | KBN020 |
|    |    | CNGA 120404S01215MEW | S01215                   | 0.4             | 2.6 | 2            | ●              | ●      | ●      |
|                                                                                     |                                                                                     | 120408S01215MEW      |                          | 0.8             | 2.5 |              | ●              | ●      | ●      |
|                                                                                     |                                                                                     | 120412S01215MEW      |                          | 1.2             | 2.5 |              | ●              | ●      | ●      |
|    |    | CNGA 120402S01225ME  | S01225                   | 0.2             | 2.6 | 2            | ●              | ●      | ●      |
|                                                                                     |                                                                                     | 120404S01225ME       |                          | 0.4             | 2.6 |              | ●              | ●      | ●      |
|                                                                                     |                                                                                     | 120408S01225ME       |                          | 0.8             | 2.6 |              | ●              | ●      | ●      |
|                                                                                     |                                                                                     | 120412S01225ME       |                          | 1.2             | 2.5 |              | ●              | ●      | ●      |
|                                                                                     |                                                                                     | 120416S01225ME       |                          | 1.6             | 3.4 |              | ●              | ●      | ●      |
|                                                                                     |                                                                                     | 120420S01225ME       |                          | 2.0             | 3.4 |              | ●              | ●      | ●      |
|   |   | CNGA 120404S01730MET | S01730                   | 0.4             | 2.6 | 2            | ●              | ●      | ●      |
|                                                                                     |                                                                                     | 120408S01730MET      |                          | 0.8             | 2.6 |              | ●              | ●      | ●      |
|                                                                                     |                                                                                     | 120412S01730MET      |                          | 1.2             | 2.5 |              | ●              | ●      | ●      |
|                                                                                     |                                                                                     | 120416S01730MET      |                          | 1.6             | 3.4 |              | ●              | ●      | ●      |
|  |  | CNGA 120408S04030MEH | S04030                   | 0.8             | 2.6 | 2            | ●              | ●      | ●      |
|                                                                                     |                                                                                     | 120412S04030MEH      |                          | 1.2             | 2.5 |              | ●              | ●      | ●      |
|  |  | DNGA 150401S01225ME  | S01225                   | 0.1             | 2.8 | 2            | ●              | ●      | ●      |
|                                                                                     |                                                                                     | 150402S01225ME       |                          | 0.2             | 2.7 |              | ●              | ●      | ●      |
|                                                                                     |                                                                                     | 150404S01225ME       |                          | 0.4             | 2.6 |              | ●              | ●      | ●      |
|                                                                                     |                                                                                     | 150408S01225ME       |                          | 0.8             | 2.2 |              | ●              | ●      | ●      |
|                                                                                     |                                                                                     | 150412S01225ME       |                          | 1.2             | 1.9 |              | ●              | ●      | ●      |
|                                                                                     |                                                                                     | 150416S01225ME       |                          | 1.6             | 3.8 |              | ●              | ●      | ●      |
|                                                                                     |                                                                                     | DNGA 150604S01225ME  | S01225                   | 0.4             | 2.6 | 2            | ●              | ●      | ●      |
|                                                                                     |                                                                                     | 150608S01225ME       |                          | 0.8             | 2.2 |              | ●              | ●      | ●      |
|                                                                                     |                                                                                     | DNGA 150404S01730MET | S01730                   | 0.4             | 2.6 | 2            | ●              | ●      | ●      |
|                                                                                     |                                                                                     | 150408S01730MET      |                          | 0.8             | 2.2 |              | ●              | ●      | ●      |
|                                                                                     |                                                                                     | 150412S01730MET      |                          | 1.2             | 1.9 |              | ●              | ●      | ●      |
|                                                                                     |                                                                                     | 150416S01730MET      |                          | 1.6             | 3.8 |              | ●              | ●      | ●      |
|  |  | DNGA 150604S01730MET | S01730                   | 0.4             | 2.6 | 2            | ●              | ●      | ●      |
|                                                                                     |                                                                                     | 150608S01730MET      |                          | 0.8             | 2.2 |              | ●              | ●      | ●      |
|  |  | DNGA 150404S04030MEH | S04030                   | 0.4             | 2.6 | 2            | ●              | ●      | ●      |
|                                                                                     |                                                                                     | 150408S04030MEH      |                          | 0.8             | 2.2 |              | ●              | ●      | ●      |
|                                                                                     |                                                                                     | 150412S04030MEH      |                          | 1.2             | 1.9 |              | ●              | ●      | ●      |

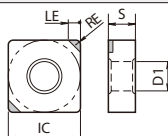
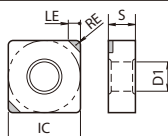
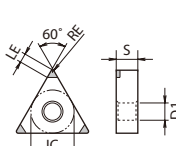
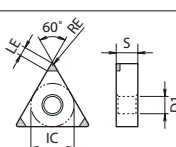
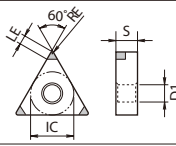
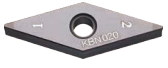
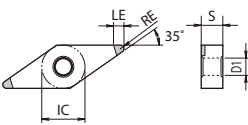
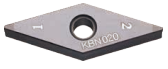
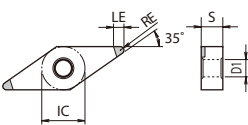
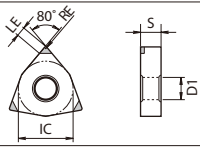
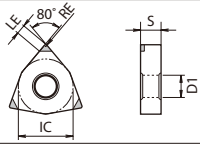
● : Standard Stock



## Standard Stock (Negative)

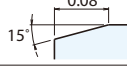
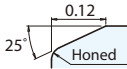
| Cutting Edge Preparation |                            |                                          |                                                                                   |
|--------------------------|----------------------------|------------------------------------------|-----------------------------------------------------------------------------------|
| Symbol                   | Cutting Edge Specification | Indication Example                       | Shape                                                                             |
| S                        | Chamfered and Honed        | S01225 0.12 mm x 25° chamfered and honed |  |

| Description | IC    | S    | D1   |
|-------------|-------|------|------|
| SNGA 1204_  | 12.70 | 4.76 | 5.16 |
| TNGA 1604_  | 9.525 | 4.76 | 3.81 |
| VNGA 1604_  | 9.525 | 4.76 | 3.81 |
| WNGA 0804_  | 12.70 | 4.76 | 5.16 |

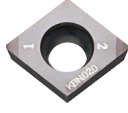
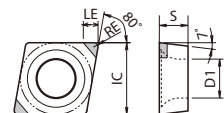
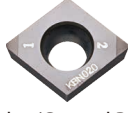
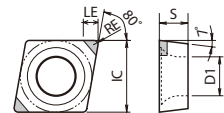
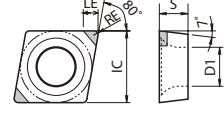
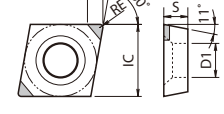
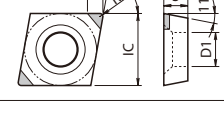
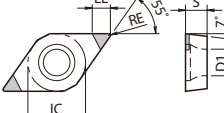
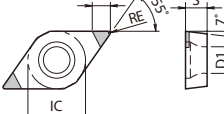
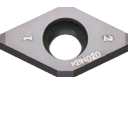
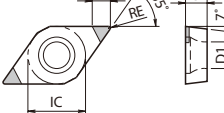
| Shape                                                                                                          |                                                                                     | Description          | Cutting Edge Preparation | Dimensions (mm) |     | No. of Edges | MEGACOAT TOUGH |        |        |
|----------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|----------------------|--------------------------|-----------------|-----|--------------|----------------|--------|--------|
|                                                                                                                |                                                                                     |                      |                          | RE              | LE  |              | KBN015         | KBN010 | KBN020 |
| <br>Multi Edge                |    | SNGA 120404S01225ME  | S01225                   | 0.4             | 2.6 | 2            | ●              | ●      | ●      |
|                                                                                                                |                                                                                     | 120408S01225ME       |                          | 0.8             | 2.6 |              | ●              | ●      | ●      |
| <br>Multi Edge/Tough          |    | SNGA 120404S01730MET | S01730                   | 0.4             | 2.6 | 2            | ●              | ●      | ●      |
|                                                                                                                |                                                                                     | 120408S01730MET      |                          | 0.8             | 2.6 |              | ●              | ●      | ●      |
|                                                                                                                |                                                                                     | 120412S01730MET      |                          | 1.2             | 2.6 |              | ●              | ●      | ●      |
| <br>Multi Edge                |    | TNGA 160401S01225ME  | S01225                   | 0.1             | 2.9 | 3            | ●              | ●      | ●      |
|                                                                                                                |                                                                                     | 160402S01225ME       |                          | 0.2             | 2.8 |              | ●              | ●      | ●      |
|                                                                                                                |                                                                                     | 160404S01225ME       |                          | 0.4             | 2.7 |              | ●              | ●      | ●      |
|                                                                                                                |                                                                                     | 160408S01225ME       |                          | 0.8             | 2.4 |              | ●              | ●      | ●      |
|                                                                                                                |                                                                                     | 160412S01225ME       |                          | 1.2             | 2.1 |              | ●              | ●      | ●      |
| <br>Multi Edge/Tough        |  | TNGA 160404S01730MET | S01730                   | 0.4             | 2.7 | 3            | ●              | ●      | ●      |
|                                                                                                                |                                                                                     | 160408S01730MET      |                          | 0.8             | 2.4 |              | ●              | ●      | ●      |
|                                                                                                                |                                                                                     | 160412S01730MET      |                          | 1.2             | 2.1 |              | ●              | ●      | ●      |
| <br>Multi Edge/Interruption |  | TNGA 160404S04030MEH | S04030                   | 0.4             | 2.7 | 3            | ●              | ●      | ●      |
|                                                                                                                |                                                                                     | 160408S04030MEH      |                          | 0.8             | 2.4 |              | ●              | ●      | ●      |
| <br>Multi Edge              |  | VNGA 160401S01225ME  | S01225                   | 0.1             | 2.6 | 2            | ●              | ●      | ●      |
|                                                                                                                |                                                                                     | 160402S01225ME       |                          | 0.2             | 2.3 |              | ●              | ●      | ●      |
|                                                                                                                |                                                                                     | 160404S01225ME       |                          | 0.4             | 2.0 |              | ●              | ●      | ●      |
|                                                                                                                |                                                                                     | 160408S01225ME       |                          | 0.8             | 2.7 |              | ●              | ●      | ●      |
| <br>Multi Edge/Tough        |  | VNGA 160404S01730MET | S01730                   | 0.4             | 2.0 | 2            | ●              | ●      | ●      |
|                                                                                                                |                                                                                     | 160408S01730MET      |                          | 0.8             | 2.7 |              | ●              | ●      | ●      |
| <br>Multi Edge              |  | WNGA 080404S01225ME  | S01225                   | 0.4             | 2.6 | 3            | ●              | ●      | ●      |
|                                                                                                                |                                                                                     | 080408S01225ME       |                          | 0.8             | 2.6 |              | ●              | ●      | ●      |
| <br>Multi Edge/Tough        |  | WNGA 080404S01730MET | S01730                   | 0.4             | 2.0 | 3            | ●              | ●      | ●      |
|                                                                                                                |                                                                                     | 080408S01730MET      |                          | 0.8             | 2.6 |              | ●              | ●      | ●      |

● : Standard Stock

## Standard Stock (Positive)

| Cutting Edge Preparation |                            |                                          |                                                                                   |
|--------------------------|----------------------------|------------------------------------------|-----------------------------------------------------------------------------------|
| Symbol                   | Cutting Edge Specification | Indication Example                       | Shape                                                                             |
| T                        | Chamfered                  | T00815 0.08 mm x 15° chamfered           |  |
| S                        | Chamfered and Honed        | S01225 0.12 mm x 25° chamfered and honed |  |

| Description | IC    | S    | D1  |
|-------------|-------|------|-----|
| CCMW 0602_  | 6.35  | 2.38 | 2.8 |
| CCMW 09T3_  | 9.525 | 3.97 | 4.4 |
| CPGB 0802_  | 7.94  | 2.38 | 3.5 |
| CPGB 0903_  | 9.525 | 3.18 | 4.5 |
| DCMW 0702_  | 6.35  | 2.38 | 2.8 |
| DCMW 11T3_  | 9.525 | 3.97 | 4.4 |

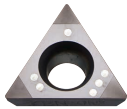
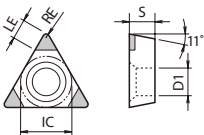
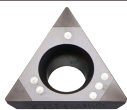
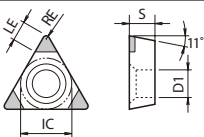
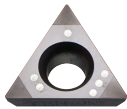
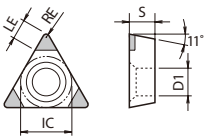
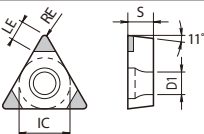
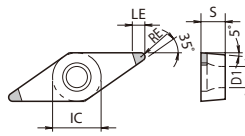
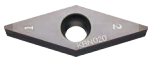
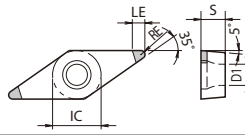
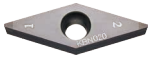
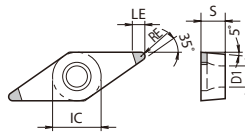
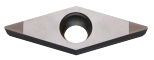
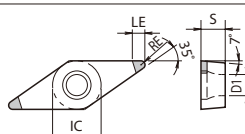
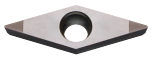
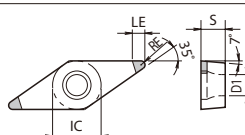
| Shape                                                                                                             | Description                                                                         | Cutting Edge Preparation | Dimensions (mm) |     | No. of Edges | MEGACOAT TOUGH |        |        |
|-------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------|-----------------|-----|--------------|----------------|--------|--------|
|                                                                                                                   |                                                                                     |                          | RE              | LE  |              | KBN015         | KBN010 | KBN020 |
| <br>Multi Edge                   |    | T00815                   | 0.2             | 2.0 | 2            | ●              | ●      | ●      |
|                                                                                                                   |                                                                                     |                          | 0.4             | 1.9 |              | ●              | ●      | ●      |
|                                                                                                                   |                                                                                     |                          | 0.8             | 1.8 |              | ●              | ●      | ●      |
|                                                                                                                   |                                                                                     | T00815                   | 0.2             | 2.0 | 2            | ●              | ●      | ●      |
|                                                                                                                   |                                                                                     |                          | 0.4             | 1.9 |              | ●              | ●      | ●      |
|                                                                                                                   |                                                                                     |                          | 0.8             | 1.8 |              | ●              | ●      | ●      |
| <br>Multi Edge/General Purpose   |    | S01225                   | 0.4             | 1.9 | 2            | ●              | ●      | ●      |
|                                                                                                                   |                                                                                     |                          | 0.8             | 1.8 |              | ●              | ●      | ●      |
|                                                                                                                   |                                                                                     | S01225                   | 0.4             | 1.9 | 2            | ●              | ●      | ●      |
|                                                                                                                   |                                                                                     |                          | 0.8             | 1.8 |              | ●              | ●      | ●      |
| <br>Multi Edge/Tough            |   | S01035                   | 0.4             | 1.9 | 2            | ●              | ●      | ●      |
|                                                                                                                   |                                                                                     |                          | 0.8             | 1.8 |              | ●              | ●      | ●      |
| <br>Multi Edge                 |  | T00815                   | 0.4             | 1.9 | 2            | ●              | ●      | ●      |
|                                                                                                                   |                                                                                     |                          | 0.2             | 2.6 |              | ●              | ●      | ●      |
|                                                                                                                   |                                                                                     | T00815                   | 0.4             | 2.6 | 2            | ●              | ●      | ●      |
| <br>Multi Edge/General Purpose |  | S01225                   | 0.4             | 2.5 | 2            | ●              | ●      | ●      |
|                                                                                                                   |                                                                                     |                          | 0.8             | 2.5 |              | ●              | ●      | ●      |
| <br>Multi Edge/Tough           |  | S01035                   | 0.4             | 1.9 | 2            | ●              | ●      | ●      |
|                                                                                                                   |                                                                                     |                          | 0.8             | 2.2 |              | ●              | ●      | ●      |
|                                                                                                                   |                                                                                     | S01035                   | 0.4             | 2.5 | 2            | ●              | ●      | ●      |
|                                                                                                                   |                                                                                     |                          | 0.8             | 2.5 |              | ●              | ●      | ●      |
| <br>Multi Edge                 |  | T00815                   | 0.2             | 2.4 | 2            | ●              | ●      | ●      |
|                                                                                                                   |                                                                                     |                          | 0.4             | 2.2 |              | ●              | ●      | ●      |
|                                                                                                                   |                                                                                     |                          | 0.8             | 1.9 |              | ●              | ●      | ●      |
|                                                                                                                   |                                                                                     | T00815                   | 0.2             | 2.4 | 2            | ●              | ●      | ●      |
|                                                                                                                   |                                                                                     |                          | 0.4             | 2.2 |              | ●              | ●      | ●      |
|                                                                                                                   |                                                                                     |                          | 0.8             | 1.9 |              | ●              | ●      | ●      |
|                                                                                                                   |                                                                                     |                          | 1.2             | 1.9 |              | ●              | ●      | ●      |
| <br>Multi Edge/General Purpose |  | S01225                   | 0.2             | 2.4 | 2            | ●              | ●      | ●      |
|                                                                                                                   |                                                                                     |                          | 0.4             | 2.2 |              | ●              | ●      | ●      |
|                                                                                                                   |                                                                                     |                          | 0.8             | 1.9 |              | ●              | ●      | ●      |
| <br>Multi Edge/Tough           |  | S01035                   | 0.2             | 1.9 | 2            | ●              | ●      | ●      |
|                                                                                                                   |                                                                                     |                          | 0.4             | 1.7 |              | ●              | ●      | ●      |
|                                                                                                                   |                                                                                     |                          | 0.8             | 1.9 |              | ●              | ●      | ●      |
|                                                                                                                   |                                                                                     | S01035                   | 0.2             | 2.4 | 2            | ●              | ●      | ●      |
|                                                                                                                   |                                                                                     |                          | 0.4             | 2.2 |              | ●              | ●      | ●      |
|                                                                                                                   |                                                                                     |                          | 0.8             | 1.9 |              | ●              | ●      | ●      |
|                                                                                                                   |                                                                                     |                          | 1.2             | 1.9 |              | ●              | ●      | ●      |
|                                                                                                                   |                                                                                     |                          | 0.2             | 2.4 |              | ●              | ●      | ●      |

● : Standard Stock

## Standard Stock (Positive)

| Cutting Edge Preparation |                            |                    |                                   |       |
|--------------------------|----------------------------|--------------------|-----------------------------------|-------|
| Symbol                   | Cutting Edge Specification | Indication Example |                                   | Shape |
| T                        | Chamfered                  | T00815             | 0.08 mm x 15° chamfered           |       |
| S                        | Chamfered and Honed        | S01225             | 0.12 mm x 25° chamfered and honed |       |

| Description | IC    | S    | D1  |
|-------------|-------|------|-----|
| TPGB 1103_  | 6.35  | 3.18 | 3.5 |
| TPGB 1603_  | 9.525 |      | 4.5 |
| TPGW 1604_  | 9.525 | 4.76 | 4.4 |
| VBGW 1103_  | 6.35  | 3.18 | 2.8 |
| VBGW 1604_  | 9.525 | 4.76 | 4.4 |
| VCGW 0802_  | 4.76  | 2.38 | 2.3 |

| Shape                                                                                                             |                                                                                     | Description                                                | Cutting<br>Edge<br>Preparation | Dimensions<br>(mm)                                         |        | No. of<br>Edges | MEGACOAT<br>TOUGH |        |        |   |   |
|-------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------|--------------------------------|------------------------------------------------------------|--------|-----------------|-------------------|--------|--------|---|---|
|                                                                                                                   |                                                                                     |                                                            |                                | RE                                                         | LE     |                 | KBN015            | KBN010 | KBN020 |   |   |
| <br>Multi Edge                   |    | TPGB 110302T00815ME<br>110304T00815ME<br>110308T00815ME    | T00815                         | 0.2                                                        | 2.3    | 3               | ●                 | ●      | ●      |   |   |
|                                                                                                                   |                                                                                     |                                                            |                                | 0.4                                                        | 2.1    |                 | ●                 | ●      | ●      |   |   |
|                                                                                                                   |                                                                                     |                                                            |                                | 0.8                                                        | 1.8    |                 | ●                 | ●      | ●      |   |   |
| <br>Multi Edge/General Purpose   |    | TPGB 110304S01225MES<br>110308S01225MES                    | S01225                         | 0.4                                                        | 2.1    | 3               | ●                 | ●      | ●      |   |   |
|                                                                                                                   |                                                                                     |                                                            |                                | 0.8                                                        | 1.8    |                 | ●                 | ●      | ●      |   |   |
| <br>Multi Edge/Tough             |   | TPGB 110302S01035MET<br>110304S01035MET<br>110308S01035MET | S01035                         | 0.2                                                        | 2.3    | 3               | ●                 | ●      | ●      |   |   |
|                                                                                                                   |                                                                                     |                                                            |                                |                                                            | 0.4    |                 | 2.1               | ●      | ●      | ● |   |
|                                                                                                                   |                                                                                     |                                                            |                                |                                                            | 0.8    |                 | 1.8               | ●      | ●      | ● |   |
|                                                                                                                   |                                                                                     |                                                            |                                | TPGB 160304S01035MET<br>160308S01035MET                    | S01035 | 0.4             | 1.8               | 3      | ●      | ● | ● |
|                                                                                                                   |                                                                                     |                                                            |                                |                                                            |        | 0.8             | 1.5               |        | ●      | ● | ● |
| <br>Multi Edge/Tough           |  | TPGW 160404S01035MET<br>160408S01035MET                    | S01035                         | 0.4                                                        | 1.8    | 3               | ●                 | ●      | ●      |   |   |
|                                                                                                                   |                                                                                     |                                                            |                                |                                                            | 0.8    |                 | 1.5               | ●      | ●      | ● |   |
| <br>Multi Edge                 |  | VBGW 110302T00815ME<br>110304T00815ME<br>110308T00815ME    | T00815                         | 0.2                                                        | 2.4    | 2               | ●                 | ●      | ●      |   |   |
|                                                                                                                   |                                                                                     |                                                            |                                |                                                            | 0.4    |                 | 2.0               | ●      | ●      | ● |   |
|                                                                                                                   |                                                                                     |                                                            |                                |                                                            | 0.8    |                 | 1.7               | ●      | ●      | ● |   |
|                                                                                                                   |                                                                                     |                                                            |                                | VBGW 160402T00815ME<br>160404T00815ME<br>160408T00815ME    | T00815 | 0.2             | 2.4               | 2      | ●      | ● | ● |
|                                                                                                                   |                                                                                     |                                                            |                                | 0.4                                                        |        | 2.0             | ●                 |        | ●      | ● |   |
|                                                                                                                   |                                                                                     |                                                            |                                | 0.8                                                        |        | 1.7             | ●                 |        | ●      | ● |   |
| <br>Multi Edge/General Purpose |  | VBGW 110304S01225MES                                       | S01225                         | 0.4                                                        | 2.0    | 2               | ●                 | ●      | ●      |   |   |
|                                                                                                                   |                                                                                     | VBGW 160404S01225MES                                       | S01225                         | 0.4                                                        | 2.0    | 2               | ●                 | ●      | ●      |   |   |
| <br>Multi Edge/Tough           |  | VBGW 110302S01035MET<br>110304S01035MET<br>110308S01035MET | S01035                         | 0.2                                                        | 2.4    | 2               | ●                 | ●      | ●      |   |   |
|                                                                                                                   |                                                                                     |                                                            |                                |                                                            | 0.4    |                 | 2.0               | ●      | ●      | ● |   |
|                                                                                                                   |                                                                                     |                                                            |                                |                                                            | 0.8    |                 | 1.7               | ●      | ●      | ● |   |
|                                                                                                                   |                                                                                     |                                                            |                                | VBGW 160402S01035MET<br>160404S01035MET<br>160408S01035MET | S01035 | 0.2             | 2.4               | 2      | ●      | ● | ● |
|                                                                                                                   |                                                                                     |                                                            |                                | 0.4                                                        |        | 2.0             | ●                 |        | ●      | ● |   |
|                                                                                                                   |                                                                                     |                                                            |                                | 0.8                                                        |        | 1.7             | ●                 |        | ●      | ● |   |
| <br>Multi Edge                 |  | VCGW 080202T00815ME<br>080204T00815ME                      | T00815                         | 0.2                                                        | 2.4    | 2               | ●                 | ●      | ●      |   |   |
|                                                                                                                   |                                                                                     |                                                            |                                |                                                            | 0.4    |                 | 2.0               | ●      | ●      | ● |   |
| <br>Multi Edge/Tough           |  | VCGW 080202S01035MET<br>080204S01035MET<br>080208S01035MET | S01035                         | 0.2                                                        | 2.4    | 2               | ●                 | ●      | ●      |   |   |
|                                                                                                                   |                                                                                     |                                                            |                                |                                                            | 0.4    |                 | 2.0               | ●      | ●      | ● |   |
|                                                                                                                   |                                                                                     |                                                            |                                |                                                            | 0.8    |                 | 1.7               | ●      | ●      | ● |   |

● : Standard Stock

