



## TURNING TOOLS

# CBN & PCD INSERT STANDARDS

# CBN & PCD INSERT GRADES

INDENTIFICATION .....	B002
CBN (CUBIC BORON NITRIDE) .....	B008
PCD (SINTERED DIAMOND) .....	B013
CLASSIFICATION OF CBN INSERTS .....	B014
CLASSIFICATION OF PCD INSERTS .....	B016

### STANDARD OF CBN TURNING INSERTS

#### NEGATIVE INSERTS WITH HOLE

CN $\circ\circ$ TYPE	··RHOMBIC 80°	·····	B018
DN $\circ\circ$ TYPE	··RHOMBIC 55°	·····	B020
SN $\circ\circ$ TYPE	··SQUARE 90°	·····	B022
TN $\circ\circ$ TYPE	··TRIANGULAR 60°	·····	B023
VN $\circ\circ$ TYPE	··RHOMBIC 35°	·····	B024
WN $\circ\circ$ TYPE	··TRIGON 80°	·····	B025

#### NEGATIVE INSERTS WITHOUT HOLE

CN $\circ\circ$ TYPE	··RHOMBIC 80°	·····	B026
DN $\circ\circ$ TYPE	··RHOMBIC 55°	·····	B026
RN $\circ\circ$ TYPE	··ROUND	·····	B026
SN $\circ\circ$ TYPE	··SQUARE 90°	·····	B027
TN $\circ\circ$ TYPE	··TRIANGULAR 60°	·····	B027

#### POSITIVE INSERTS WITH HOLE

CC $\circ\circ$ TYPE	··RHOMBIC 80°	·····	B028
CP $\circ\circ$ TYPE	··RHOMBIC 80°	·····	B030
DC $\circ\circ$ TYPE	··RHOMBIC 55°	·····	B031
TC $\circ\circ$ TYPE	··TRIANGULAR 60°	·····	B033
TP $\circ\circ$ TYPE	··TRIANGULAR 60°	·····	B034
VB $\circ\circ$ TYPE	··RHOMBIC 35°	·····	B035
VC $\circ\circ$ TYPE	··RHOMBIC 35°	·····	B036
WC $\circ\circ$ TYPE	··TRIGON 80°	·····	B036

#### POSITIVE INSERTS WITHOUT HOLE

RTG TYPE	·····	B037	
SP $\circ\circ$ TYPE	··SQUARE 90°	·····	B037
TB $\circ\circ$ TYPE	··TRIANGULAR 60°	·····	B038
TP $\circ\circ$ TYPE	··TRIANGULAR 60°	·····	B038
DGJ TYPE	·····	B039	
GY TYPE	·····	B040	
MGTR TYPE	·····	B041	

### STANDARD OF PCD TURNING INSERTS

#### NEGATIVE INSERTS WITH HOLE

CN $\circ\circ$ TYPE	··RHOMBIC 80°	·····	B042
DN $\circ\circ$ TYPE	··RHOMBIC 55°	·····	B042
SN $\circ\circ$ TYPE	··SQUARE 90°	·····	B043
TN $\circ\circ$ TYPE	··TRIANGULAR 60°	·····	B043
VN $\circ\circ$ TYPE	··RHOMBIC 35°	·····	B044

#### NEGATIVE INSERTS WITHOUT HOLE

SN $\circ\circ$ TYPE	··SQUARE 90°	·····	B045
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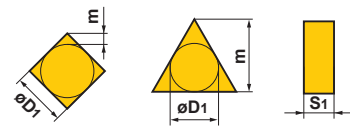
#### POSITIVE INSERTS WITH HOLE

CC $\circ\circ$ TYPE	··RHOMBIC 80°	·····	B046
CP $\circ\circ$ TYPE	··RHOMBIC 80°	·····	B046
DC $\circ\circ$ TYPE	··RHOMBIC 55°	·····	B047
DE $\circ\circ$ TYPE	··RHOMBIC 55°	·····	B047
SP $\circ\circ$ TYPE	··SQUARE 90°	·····	B048
TC $\circ\circ$ TYPE	··TRIANGULAR 60°	·····	B048
TE $\circ\circ$ TYPE	··TRIANGULAR 60°	·····	B048
TP $\circ\circ$ TYPE	··TRIANGULAR 60°	·····	B049
VB $\circ\circ$ TYPE	··RHOMBIC 35°	·····	B050
VC $\circ\circ$ TYPE	··RHOMBIC 35°	·····	B050
VD $\circ\circ$ TYPE	··RHOMBIC 35°	·····	B050
WC $\circ\circ$ TYPE	··TRIGON 80°	·····	B051
WP $\circ\circ$ TYPE	··TRIGON 80°	·····	B051

#### POSITIVE INSERTS WITHOUT HOLE

SP $\circ\circ$ TYPE	··SQUARE 90°	·····	B052
TP $\circ\circ$ TYPE	··TRIANGULAR 60°	·····	B053

# IDENTIFICATION

Symbol	Tolerance of Nose Height <b>m</b> (mm)	Tolerance of Inscribed Circle <b>øD1</b> (mm)	Tolerance of Thickness <b>S1</b> (mm)
<b>G</b>	±0.025	±0.025	±0.13
<b>M*</b>	±0.08–±0.18	±0.05–±0.15	±0.13

Inserts marked with \* are sintered.

Detail of M Class Insert Tolerance

● Tolerance of Nose Height **m** (mm)

D.I.C.	Triangular	Square	Rhombic 80°	Rhombic 55°	Rhombic 35°	Round
<b>6.35</b>	±0.08	±0.08	±0.08	±0.11	±0.16	—
<b>9.525</b>	±0.08	±0.08	±0.08	±0.11	±0.16	—
<b>12.70</b>	±0.13	±0.13	±0.13	±0.15	—	—

● Tolerance of Inscribed Circle **øD1** (mm)

D.I.C.	Triangular	Square	Rhombic 80°	Rhombic 55°	Rhombic 35°	Round
<b>6.35</b>	±0.05	±0.05	±0.05	±0.05	±0.05	—
<b>9.525</b>	±0.05	±0.05	±0.05	±0.05	±0.05	±0.05
<b>12.70</b>	±0.08	±0.08	±0.08	±0.08	—	±0.08

<b>BF</b>	With Breaker
<b>NP</b>	New Petit Cut
<b>No mark</b>	Standard Type
<b>① Insert Geometry</b>	

**NP** - **D** **N** **G** **A**

② Insert Shape		
Symbol	Insert Shape	
<b>C</b>	Rhombic 80°	
<b>D</b>	Rhombic 55°	
<b>R</b>	Round	
<b>S</b>	Square	
<b>T</b>	Triangular	
<b>V</b>	Rhombic 35°	
<b>W</b>	Trigon	

③ Normal Clearance	
Symbol	Normal Clearance
<b>B</b>	5°
<b>C</b>	7°
<b>D</b>	15°
<b>E</b>	20°
<b>N</b>	0°
<b>P</b>	11°

⑤ Fixing and/or for Chip Breaker				
Metric				
Symbol	Hole	Hole Configuration	Chip Breaker	Figure
<b>W</b>	With Hole	Cylindrical Hole +	No	
<b>T</b>	With Hole	One Countersink (40–60°)	One Sided	
<b>B</b>	With Hole	Cylindrical Hole +	No	
<b>H</b>	With Hole	One Countersink (70–90°)	One Sided	
<b>A</b>	With Hole	Cylindrical Hole	No	
<b>M</b>	With Hole	Cylindrical Hole	One Sided	
<b>N</b>	Without Hole	—	No	
<b>X</b>	—	—	—	Special Design

Diameter of Inscribed Circle (mm)	Symbol						
3.97		<b>02</b>		<b>04</b>	<b>03</b>	<b>03</b>	<b>06</b>
4.76		<b>L3</b>	<b>08</b>	<b>05</b>	<b>04</b>	<b>04</b>	<b>08</b>
5.56		<b>03</b>	<b>09</b>	<b>06</b>	<b>05</b>	<b>05</b>	<b>09</b>
6.35		<b>04</b>	<b>11</b>	<b>07</b>	<b>06</b>	<b>06</b>	<b>11</b>
7.94		<b>05</b>	<b>13</b>	<b>09</b>	<b>08</b>	<b>07</b>	<b>13</b>
9.525	<b>09</b>	<b>06</b>	<b>16</b>	<b>11</b>	<b>09</b>	<b>09</b>	<b>16</b>
12.70	<b>12</b>	<b>08</b>	<b>22</b>	<b>15</b>	<b>12</b>	<b>12</b>	<b>22</b>

**⑥ Insert Size**

\*Thickness is from the bottom of the insert to the top of the cutting edge.

Symbol	Thickness (mm)
<b>S1</b>	1.39
<b>01</b>	1.59
<b>T0</b>	1.79
<b>02</b>	2.38
<b>T2</b>	2.78
<b>03</b>	3.18
<b>T3</b>	3.97
<b>04</b>	4.76

**⑦ Insert Thickness**

Symbol	Corner Radius (mm)
<b>02</b>	0.2
<b>04</b>	0.4
<b>08</b>	0.8
<b>12</b>	1.2
<b>16</b>	1.6

**⑧ Insert Corner Configuration**

⑥  
**15**
⑦  
**04**
⑧  
**04**
⑨  
**GA**
⑩  
**W**
⑪  
**2**
⑫  
**J**
⑬  
**R**

⑨ Application (Honing)	
Symbol	Honing
<b>GA</b>	Continuous Cutting – Medium Interrupted Cutting
<b>GS</b>	
<b>GN</b>	
<b>FA</b>	Continuous Cutting
<b>FS</b>	
<b>FN</b>	
<b>TA</b>	Interrupted Cutting
<b>TS</b>	
<b>TN</b>	

⑩ Wiper	
WS	With Wiper
<b>WC</b>	
<b>W</b>	
No mark	Without Wiper

⑪ Number of Teeth	
<b>2</b>	2
<b>3</b>	3
<b>4</b>	4
<b>6</b>	6
No mark	1

⑫ Cutting Edge Angle	
<b>F</b>	91°
<b>J</b>	93°
No mark	Non Restriction

Please pay special attention when using wiper inserts. Please refer to page A024 for further information.

⑬ Cutting Direction		
Figure	Hand	Symbol
	Right	<b>R</b>
	Left	<b>L</b>
	Neutral	<b>N</b>

Please refer to page B009 for further information.

# COATED CBN SERIES

## MBC010 / MBC020

COATED CBN SERIES | TURNING INSERTS

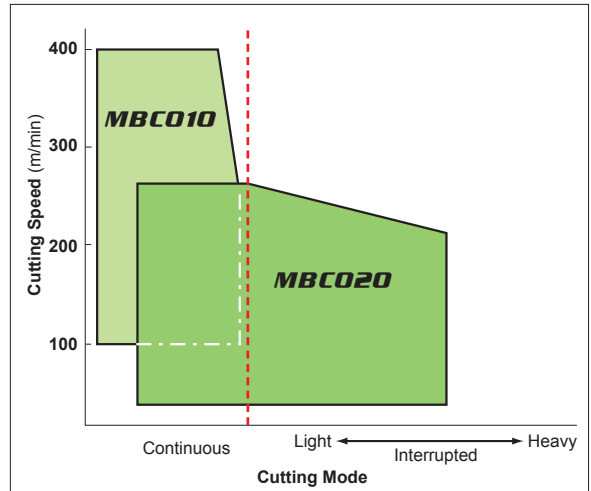
### FEATURES

#### MBC010

MBC010 is a coated CBN grade for hardened steels. High wear resistance enables high-speed cutting. Micrograin CBN makes MBC010 suitable for excellent surface finishes.

#### MBC020

MBC020 is a general purpose coated CBN grade suitable for machining hardened steel. It covers a wide range of applications from continuous to light interrupted cutting. The CBN substrate with high cutting edge rigidity and the coating based on MIRACLE coating technology improves wear resistance and allows MBC020 to cover a wider range of machining applications than conventional CBN grades.

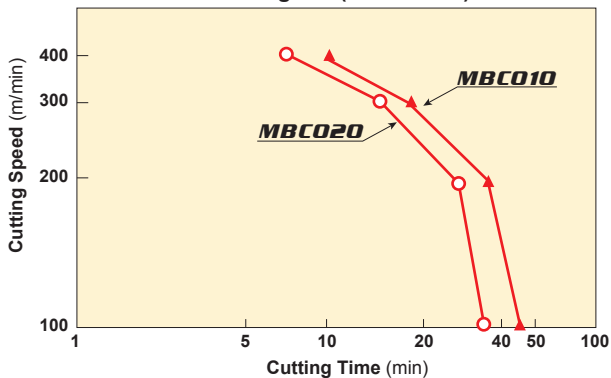


Grade	Grade Features and Application	Main Component	Coating Layer
<b>MBC010</b>	<b>Coated CBN for High Speed Continuous Cutting</b> MBC010 makes the best use of a special ceramic binder structure, actualizing high wear resistance. High wear resistance enables continuous machining at high speeds of over 300m/min.	CBN (Micro Grain) TiN Al <sub>2</sub> O <sub>3</sub>	TiN
<b>MBC020</b>	<b>Coated CBN for general cutting (First recommendation)</b> Uses a CBN substrate that has high cutting edge rigidity. The TiAlN based coating delivers superb wear resistance. CBN grade first recommendation.	CBN (Micro Grain) TiN Al <sub>2</sub> O <sub>3</sub>	TiAlN

### CUTTING PERFORMANCE

#### Continuous Cutting

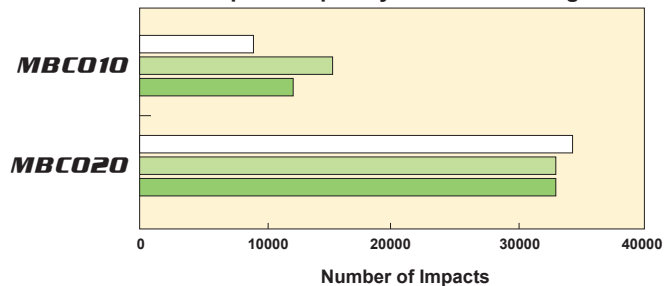
V-T Diagram (VB=0.1mm)



<Cutting Conditions>  
 Workpiece : Alloy steel (60HRC)  
 Feed : 0.1mm/rev  
 Depth of Cut : 0.1mm  
 External Continuous Cutting  
 Wet Cutting

#### Interrupted Cutting

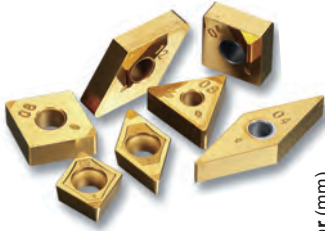
Impact frequency before fracturing



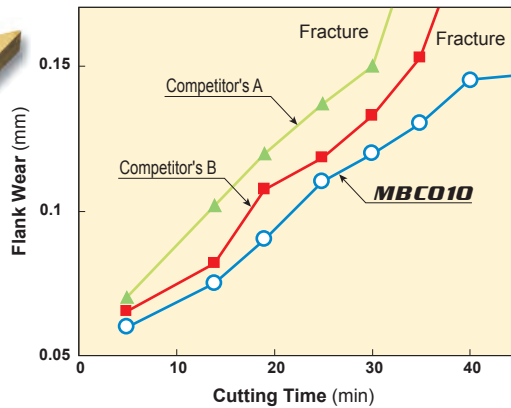
<Cutting Conditions>

Workpiece : Alloy steel (60HRC)  
 External Interrupted Cutting 8 Groove  
 Cutting Speed : 150m/min  
 Feed : 0.15mm/rev  
 Depth of Cut : 0.2mm  
 Dry Cutting

# MBC010

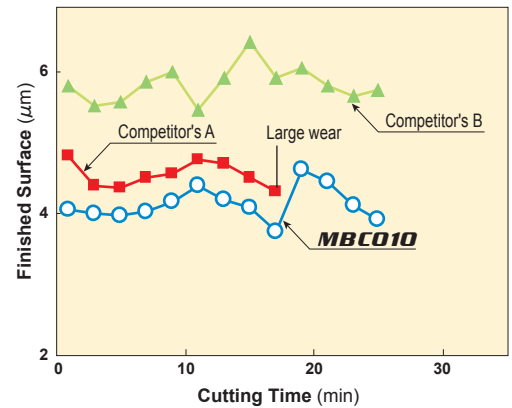


## WEAR RESISTANCE



<Cutting Conditions>  
 Workpiece : Alloy steel (60HRC)  
 Insert : NP-CNGA120408GS2  
 Cutting speed : 300m/min  
 Feed : 0.05mm/rev  
 Depth of Cut : 0.1mm  
 Dry Continuous Cutting

## FINISHED SURFACE



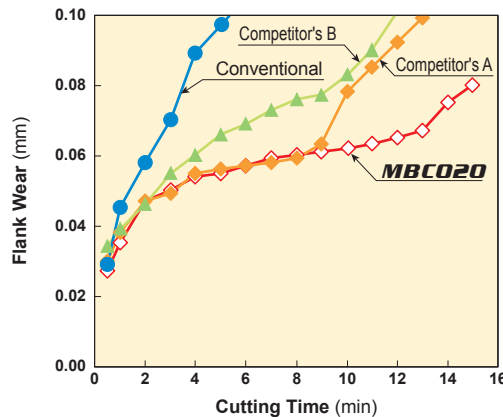
<Cutting Conditions>  
 Workpiece : Alloy steel (60HRC)  
 Insert : NP-CNGA120408GS2  
 Cutting speed : 150m/min  
 Feed : 0.15mm/rev  
 Depth of Cut : 0.2mm  
 Dry Continuous Cutting

**MBC010** employs TiN based coating for superior, consistent surface finishes.

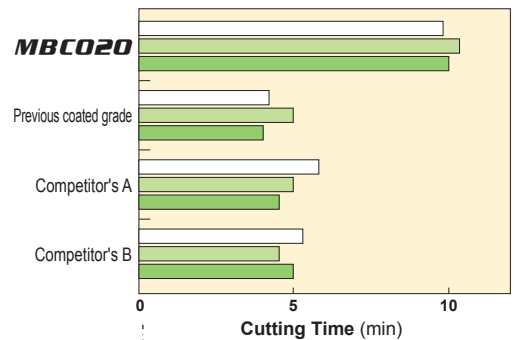
# MBC020



## TOUGHNESS



<Cutting Conditions>  
 Workpiece : Alloy steel (60HRC)  
 Round bar  
 Insert : NP-CNGA120408GA4  
 Cutting speed : 220m/min  
 Feed : 0.1mm/rev  
 Depth of Cut : 0.1mm  
 Dry Continuous Cutting



<Cutting Conditions>  
 Workpiece : Alloy steel (60HRC)  
 8 Grooves  
 Insert : NP-CNGA120408GA4  
 Cutting speed : 200m/min  
 Feed : 0.1mm/rev  
 Depth of Cut : 0.1mm  
 Dry Interrupted Cutting

**MBC020** exhibits excellent cutting performance for a wide range of applications from continuous through to interrupted machining.

# NON-COATED CBN SERIES

CBN & PCD  
TURNING INSERTS

NON-COATED CBN SERIES

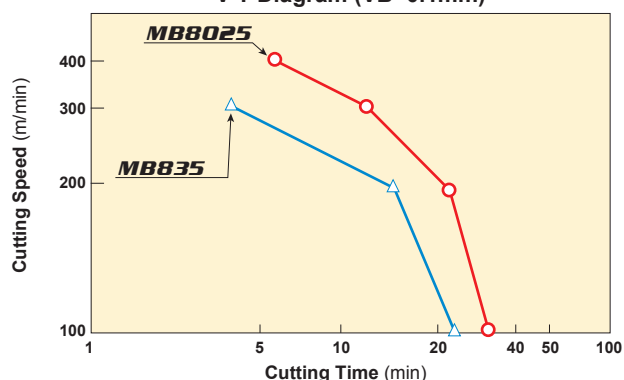
## HARDENED STEEL MACHINING

Grade	Grade Features and Application	Main Component
<b>MB8025</b>	<b>For General Purpose Turning, For Continuous to Light Interrupted Cutting</b> By employing a "Particle-activated Sintering Method", the new sintered CBN technology is recommended for continuous cutting at medium to high speeds.	CBN (Micro Grain) TiN Al <sub>2</sub> O <sub>3</sub>
<b>MB835</b>	<b>For Heavy Interrupted Cutting</b> Improved grade employing micro-grain CBN particles. Excellent fracture resistance for use in heavy interrupted cutting.	CBN (Micro Grain) TiN Al <sub>2</sub> O <sub>3</sub>

## CUTTING PERFORMANCE

### Continuous Cutting

V-T Diagram (VB=0.1mm)

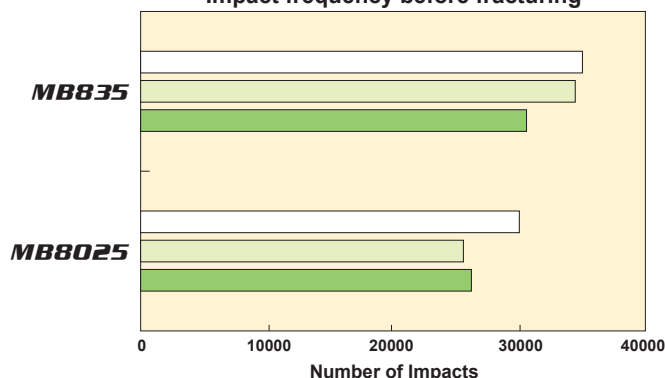


<Cutting Conditions>

Workpiece : Alloy steel (60HRC)  
Feed : 0.1mm/rev  
Depth of Cut : 0.1mm  
Wet Cutting

### Interrupted Cutting

Impact frequency before fracturing



<Cutting Conditions>

Workpiece : Alloy steel (60HRC) Feed : 0.15mm/rev  
External Interrupted Depth of Cut : 0.2mm  
Cutting 8 Groove Dry Cutting  
Cutting Speed : 150m/min

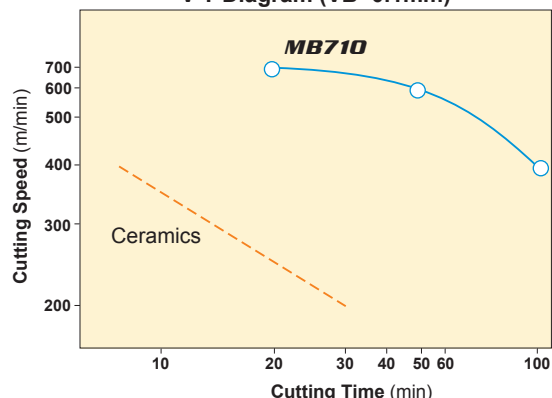
## CAST IRON MACHINING

Grade	Grade Features and Application	Main Component
<b>MB710</b>	<b>For General Cutting</b> General purpose grade with well balanced wear and fracture resistance.	CBN TiC Al <sub>2</sub> O <sub>3</sub>
<b>MB730</b>	<b>For High Speed Cutting</b> Has the larger 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) Co Base Alloy
<b>MB5140</b>	<b>For High Speed Cutting and Roughing of Cast Iron</b> Highest CBN content, high thermal conductivity. Enables deep depth of cut.	CBN AlN (Solid)

## CUTTING PERFORMANCE

### Continuous Cutting

V-T Diagram (VB=0.1mm)



<Cutting Condition of MB710>

Workpiece : DIN GG25  
Insert : TNGA160408  
Feed : 0.1mm/rev  
Depth of Cut : 0.15mm  
Wet Cutting

<Cutting Condition of Ceramics>

Workpiece : DIN GG25  
Insert : TNGA160408  
Feed : 0.1mm/rev  
Depth of Cut : 0.1mm  
Dry Cutting

## SINTERED ALLOY MACHINING

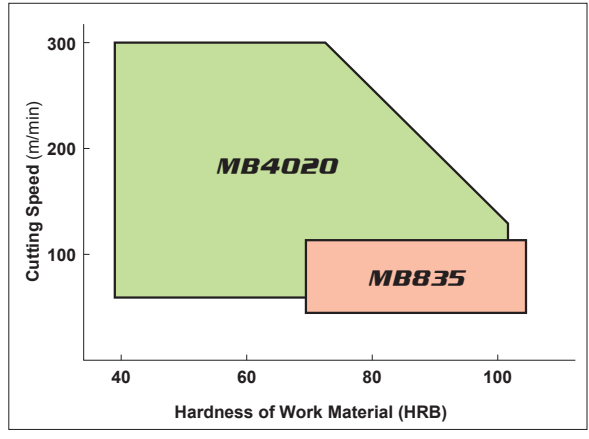
### **NEW** MB4020

#### FEATURES AND RECOMMENDED CUTTING CONDITIONS

##### ● For General Cutting

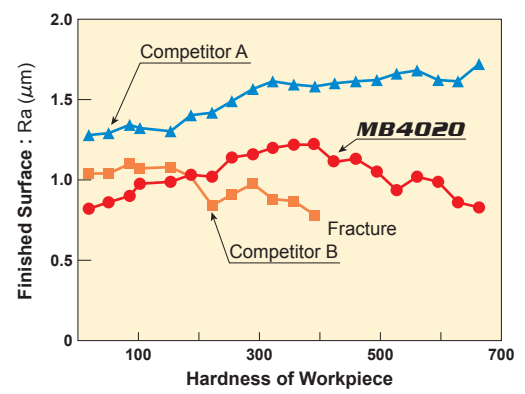
High CBN content and a special binder that bonds the CBN particles allows MB4020 to deliver long tool life during the machining of sintered alloys. A general-purpose grade suitable for the machining of various sintered alloys with different hardness and structures and varied workpiece geometries.

Work Material	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)
General sintered alloy	80 ————— 300	-0.2	-0.3
High strength sintered alloy	80 ————— 250	-0.2	-0.3
Sintered alloy	80 ————— 150	-0.2	-0.3



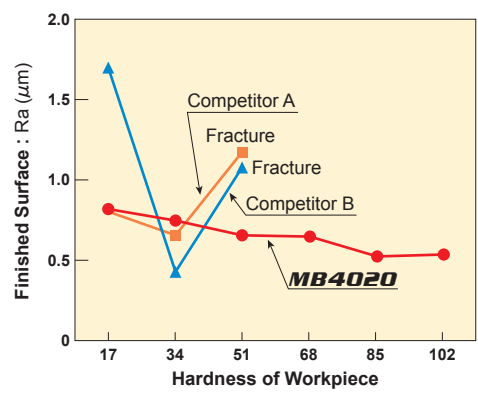
#### CUTTING PERFORMANCE

##### ■ Continuous cutting of high strength sintered alloy



<Cutting Conditions>  
 Workpiece : High strength sintered alloy    Insert : NP-CNGA120408  
 Cutting Speed : 190m/min    Feed : 0.15mm/rev  
 Depth of Cut : 0.1mm  
 Wet Cutting

##### ■ Continuous cutting of sintered alloy



<Cutting Conditions>  
 Workpiece : Sintered alloy    Insert : NP-CNGA120408  
 Cutting Speed : 100m/min    Feed : 0.15mm/rev  
 Depth of Cut : 0.1mm  
 Wet Cutting

## CBN

- Suitable for high speed finishing of heat treated steel, sintered ferrous alloy and cast iron.
- Low affinity to iron, thus good surface finishes are possible.
- Grinding can be replaced by machining.



CBN (CUBIC BORON NITRIDE) TURNING INSERTS

### SELECTION STANDARD

#### ● Heat Treated Steel

Work Material		Type	Cutting Mode	Recommended Grade	Recommended Cutting Conditions		
					Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)
Structural Steel Esp. Carburized Steel High Alloy Steel	35–65 HRC	Coated	High speed finishing cutting	<b>MBC010</b>	250 (150–400)	–0.2	–0.2
			Continuous cutting for general purpose	<b>MBC020</b>	200 (80–250)	–0.3	–0.5
			Interrupted cutting for general purpose		150 (60–200)	–0.2	–0.3
		Non-coated	Continuous cutting for general purpose	<b>MB8025</b>	180 (80–250)	–0.3	–0.5
			Interrupted cutting for general purpose		120 (60–150)	–0.2	–0.3
			Continuous to light interrupted cutting		120 (70–150)	–0.3	–0.5
Heavy interrupted cutting	<b>MB835</b>	100 (50–120)	–0.3	–0.5			

#### ● Cast Iron

Work Material		Workpiece Structure	Cutting Speed (m/min)					Feed (mm/rev)	Depth of Cut (mm)	Coolant
			250	500	750	1000	1250			
Gray Cast Iron	<b>GG25</b>	Ferritic + Pearlitic	<b>MB5140</b>					–0.5	–1.0 MBS140 –5.0	Dry, Wet
	<b>GG30</b>	Pearlitic								
Alloy Cast Iron		Pearlitic	<b>MB710</b> <b>MB730</b>					–0.4	–0.5	Dry, Wet
Ductile Cast Iron	<b>GGG40</b>	Ferritic	<b>MB710</b>					–0.4	–0.5	Dry, Wet
	<b>GGG70</b>	Ferritic + Pearlitic Pearlitic								

#### ● Sintered Alloy

Work Material	Recommended Grade	Recommended Cutting Conditions		
		Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)
General Sintered Alloy	<b>MB4020</b>	250 (80–300)	–0.2	–0.3
High Density Sintered Alloy	<b>MB4020</b>	150 (80–250)	–0.2	–0.3
Sintered Alloy	<b>MB4020, MB835</b>	100 (80–150)	–0.2	–0.3

#### ● Valve Seat

Amount of Hard Particles	None or Small ← → Large			
Hardness of Workpiece (HV)	150	250	300	350
Plunge Cut	<b>MB730</b>		<b>MB835</b>	
Traverse Cut	<b>MB730</b>		<b>MB710</b>	<b>MB835</b>

#### ● Roll

Work Material	Grade	Recommended Cutting Conditions		
		Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)
Cast Steel Adamite Cast Steel	<b>MB8025</b>	80 (30–130)	0.3 (0.1–0.5)	0.2–3.0
Ductile Cast Iron Granular Cast Iron Chilled Cast Iron	<b>MB710</b>	80 (30–130)	0.3 (0.1–0.5)	0.2–3.0
High Chromium Steel High Alloy Steel	<b>MB8025</b>	80 (30–130)	0.3 (0.1–0.5)	0.2–3.0
High Speed Steel	<b>MB730</b>	50 (20–70)	0.25 (0.1–0.4)	0.1–3.0
Cemented Carbide	<b>MB730, MBS140</b>	20 (10–30)	–0.2	–0.2

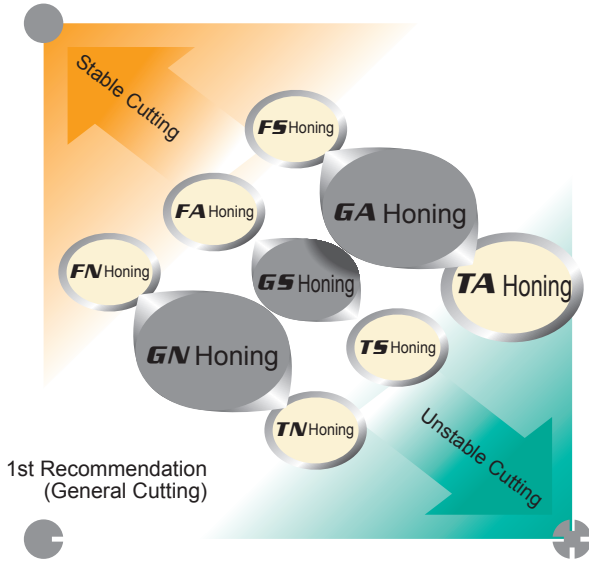
#### ● Heat Resistant Alloy

Work Material	Grade	Recommended Cutting Conditions		
		Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)
Ni Base Heat Resistant Alloy (e.g. Inconel)	<b>MB730</b>	120 (100–150)	–0.2	–0.5
Co Base Heat Resistant Alloy (e.g. Stellite)	<b>MB730</b>	70 (50–100)	–0.2	–0.5

# HONING

## NEW HONING TYPES

For CBN **MBC010** and **MBC020** coated grades, **MB4020** for sintered alloys, **MB710** and **MB730** for cast irons, a wide range of edge honing types are offered to cover a large range of applications and to represent Mitsubishi Materials' unique cutting tool technology.



### General cutting

**GA** honing is the first recommendation.  
**GS** honing if the depth of cut is 0.1mm or less.  
**GN** honing if the crater wear is large.

### Continuous cutting, stable cutting

**FS** honing is the first recommendation.  
**FA** honing to improve the initial machining performance.  
**FN** honing if the crater wear is large.

### Medium and heavy interrupted cutting, unstable cutting

**TA** honing is the first recommendation.  
**TS** honing if the depth of cut is 0.1mm or less.  
**TN** honing if the crater wear is large.

## HONING

# NP-CNGA120404 **F** **A** W2

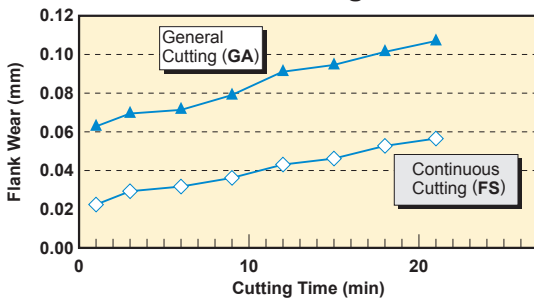
Main Application **F** **A** Edge Honing Type

EDGE HONING TYPE	<b>A</b>	<b>S</b>	<b>N</b>
MAIN APPLICATION	For General Purpose Machining (First recommendation)	For Very Small Depths of Cut (Sharp anti-burr type)	For High Load Machining (Crater wear resistant)
<b>F</b> For Continuous Machining	<b>FA</b> Honing 0.1 15° R0.015	<b>FS</b> Honing 0.1 15° R0.015	<b>FN</b> Honing 0.05 15° R0.015
<b>G</b> For Continuous – Light Interrupted Machining	<b>GA</b> Honing 0.13 25° R0.03	<b>GS</b> Honing 0.13 25° R0.015	<b>GN</b> Honing 0.05 25° R0.015
<b>T</b> For Interrupted Machining	<b>TA</b> Honing 0.13 35° R0.03	<b>TS</b> Honing 0.13 35° R0.015	<b>TN</b> Honing 0.05 35° R0.015

(Note) First, select the insert edge type from the main application area (F,G,T) then choose a honing type (A,S,N) that compliments the machining requirement.

## CUTTING PERFORMANCE

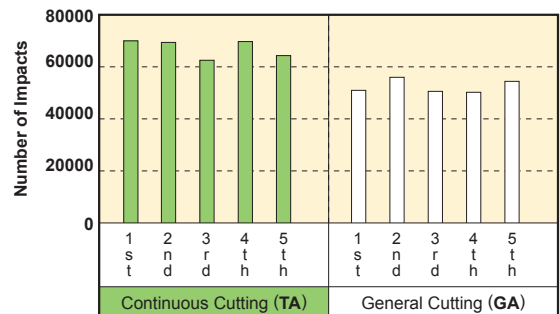
### For Continuous Cutting **FS** HONING



<Cutting Condition>

Workpiece : Alloy steel (60HRC)  
 Insert : NP-CNGA120408FS2/GA2 (MBC010)  
 Cutting Speed : 150m/min  
 Feed : 0.1mm/rev  
 Depth of Cut : 0.1mm  
 Dry Cutting

### For Interrupted Cutting **TA** HONING



<Cutting Condition>

Workpiece : Alloy steel (60HRC)  
 External Interrupted Cutting, 8 Grooves  
 Insert : NP-TNGA160408TA3/GA3 (MB8025)  
 Cutting Speed : 100m/min  
 Feed : 0.1mm/rev  
 Depth of Cut : 0.1mm  
 Wet Cutting

# CBN GROOVING SERIES

(*NEW* GY/*NEW* MG/DG)



## FEATURES

- A combination with a high rigidity holder ensures high accuracy and long tool life.

Holder rigidity is essential when grooving hardened steel. The GY series TriForce system offers high rigidity equivalent to a solid type tool. MG has a wide insert location face for high gripping force. The insert and holder combination allows delivery of excellent performance when grooving hardened steel.

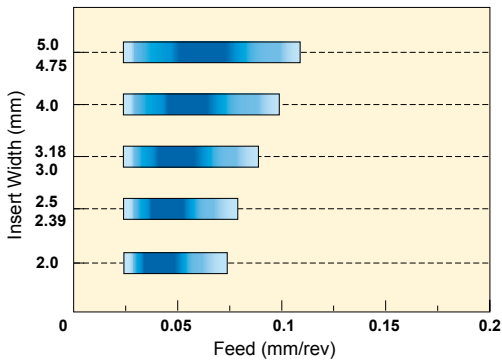
- Product line-up for different holder properties

MG for narrow grooves and GY for general grooves are both available to allow selection of the most suitable tool.

CBN & PCD TURNING INSERTS

CBN GROOVING SERIES

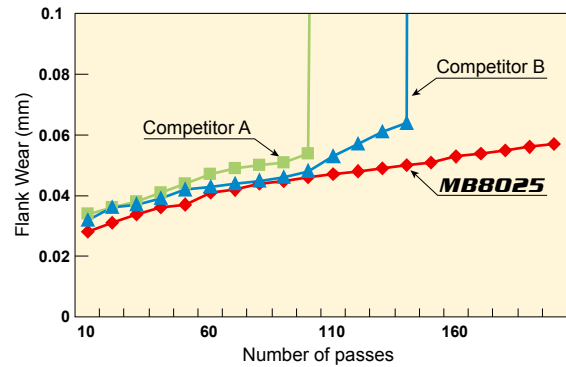
## RECOMMENDED CUTTING CONDITIONS



Work Material	Hardness	Grade	Cutting Speed (m/min)	Coolant
H Hardened Steel	35-65HRC	MB8025	100 (60-120)	Dry, Wet

## CUTTING PERFORMANCE

- Tool life evaluation for the GY holder



<Cutting Conditions>

Workpiece : Alloy steel (HRC60)      Depth of Cut : 0.35mm  
 Cutting Speed : 120m/min              Dry Cutting  
 Feed : 0.1mm/rev

## APPLICATION EXAMPLE

Insert	GY1G0300F020N-GFGS (Grade : MB8025)	MGTR43200 (Grade : MB8025)
Workpiece	Transmission shaft (Alloy steel (HRC58~62)) 	Transmission shaft (Alloy steel (HRC61~65)) 
Cutting Conditions	Cutting Speed (m/min)	129
	Feed (mm/rev)	0.1
Result	 GY achieves longer tool life without fracturing.	 2.5 times longer tool life than the conventional insert.

# CBN BREAKER INSERT NEW

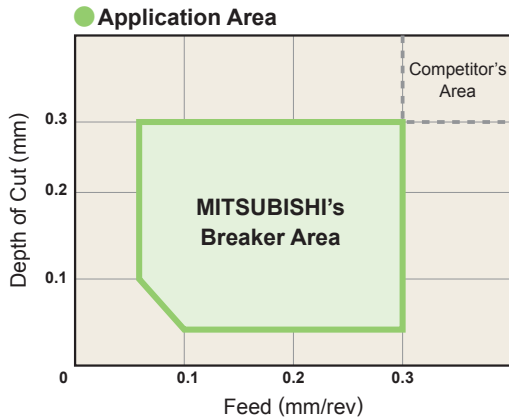
## FEATURES

### ● Chip Breaker Geometry Designed for Excellent Chip Control

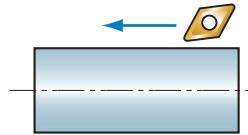
R-shaped chip breaker ensures optimization of the cutting point and the chip breaker position. Enables effective chip discharge even when copying and also prevents the fine chips generated during finishing operations from wrapping round the tool holder. Additionally, positive inserts are available that offer improved chip disposal when boring.

### ● Long Life Coated CBN Grade

The coated grade MBC020 made with MIRACLE coating technology exhibits high cutting performance over a wide range of machining applications from continuous through to medium interrupted cutting.

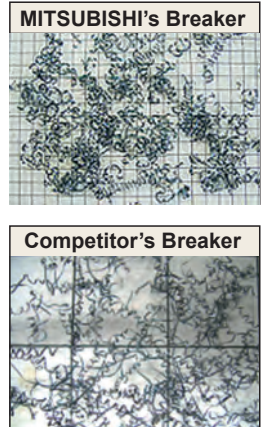


### ● External Turning



<Cutting Conditions>

Workpiece : Alloy Steel (55HRC)  
 Insert : BF-CNGG120408TA4  
 Cutting Speed : 100m/min  
 Feed : 0.2mm/rev  
 Depth of Cut : 0.1mm  
 Dry Cutting



# MULTI-CORNER TYPE INSERTS

### ● A single sided, multi-corner type insert has no cutting edges on the underside.

The type of grade is stamped on the upper side.

#### Double Sided, multi-corner type insert

Available in MBC020 grade.

**NP-CNGA120408GA4**

No. of Cutting Edge Corners \_\_\_\_\_

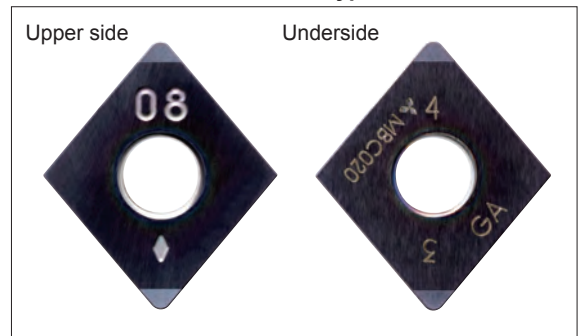
#### Single Sided, multi-corner type insert

Available in CBN grades except MB810.

**NP-CNGA120408GA2**

No. of Cutting Edge Corners \_\_\_\_\_

#### Double sided, multi-corner type insert



### NEW Corner R0.2 insert

Corner R0.2 inserts are available in MBC020, making it suitable for copying and corner radius machining.

# WIPER INSERT

CBN & PCD TURNING INSERTS  
WIPER INSERT

## ● Improving Surface Finish

Under the same machining conditions as conventional breakers, but with the feed rate increased, the surface finish of the workpiece can be improved.

## ● Improving Efficiency

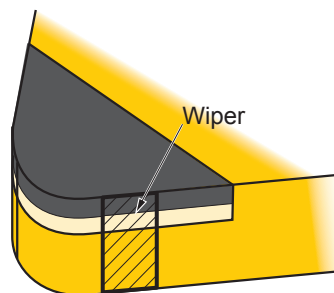
High feed rates not only shorten machining times but also make it possible to combine roughing and finishing operations.

## ● Increased Tool Life

When using to high feed conditions, the time required to cut one component is decreased, thus more parts can be machined with each insert. In addition, the high feed rate prevents rubbing, therefore, delaying the progression of wear and increasing the tool life of the insert.

## ● Improving Chip Control

Under high feed conditions, the chips generated become thicker and are more easily broken, thus, chip control is improved.



## ■ Insert example

Conventional wiper insert

**NP-CNGA120408GW**

Wiper Symbol

**NEW**

Wiper insert for low rigidity workpieces

**NP-CNGA120408GAWS2**

WC : Stable Cutting

WS : General Cutting

CBN wiper inserts for low rigidity workpieces are now available in MBC010, MBC020 and MB8025 grade, making it suitable for use in application areas where conventional inserts cannot be used due to vibrations.

## ■ CUTTING PERFORMANCE

<Cutting Conditions>

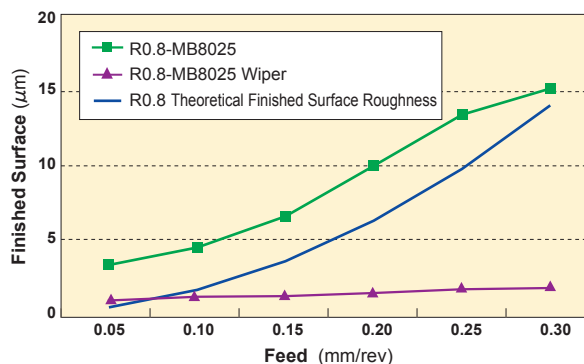
Workpiece : Hardened Material (HRC60)

Depth of Cut : 0.1mm

Insert : NP-CNGA120408

Dry Cutting

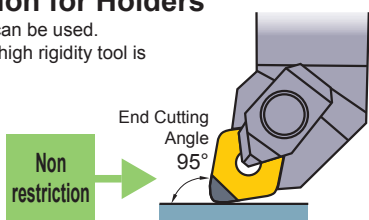
Cutting Speed : 120m/min



## NOTES FOR USE

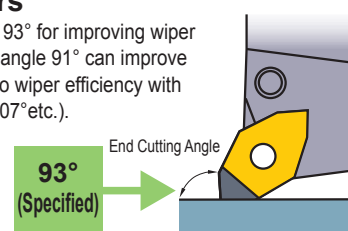
### ■ No Restriction for Holders

A standard holder can be used.  
(\*A double clamp, high rigidity tool is recommended.)



### ■ Restriction for Holders

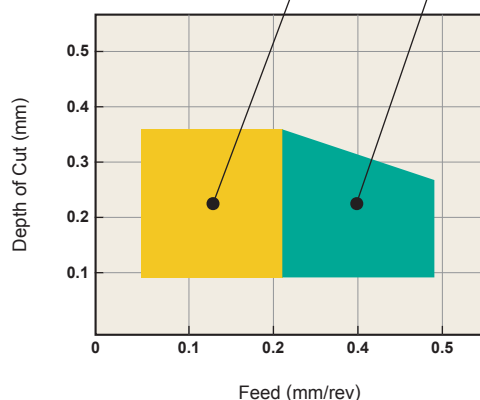
Use a holder with end cutting angle 93° for improving wiper efficiency. A holder with end cutting angle 91° can improve wiper efficiency, however, there is no wiper efficiency with other end cutting angles (60°, 90°, 107° etc.).



## RECOMMENDED CUTTING CONDITIONS AND PERFORMANCE

High feed (high efficiency) application area

High precision finishing application area



### High precision finishing

Cutting Speed: 100m/min Feed: 0.1mm/rev  
Depth of Cut: 0.1mm Dry Cutting

Without Wiper



Ry=3.2µm

With Wiper



Ry=1.0µm

### High feed, high efficiency machining

Cutting Speed: 100m/min Feed: 0.3mm/rev  
Depth of Cut: 0.1mm Dry Cutting

Without Wiper



Ry=12.2µm

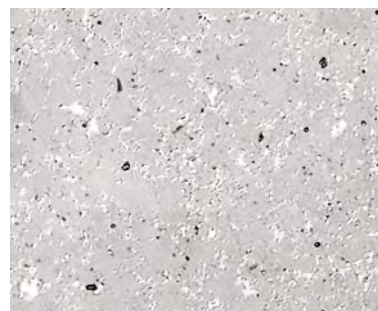
With Wiper



Ry=1.2µm

# SINTERED DIAMOND PCD GRADE MD220

- Suitable for materials such as aluminium alloy, non-ferrous metals, and fibre strengthened plastic.
- Suitable for extremely high speed finishing.



Micro-Structure of MD220

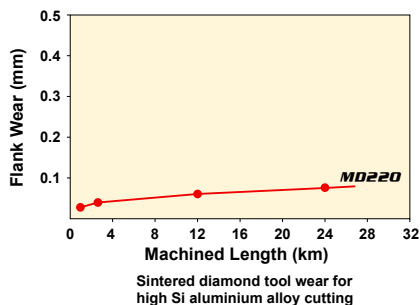
## RECOMMENDED CUTTING CONDITIONS

### ● TURNING

Work Material	Recommended Cutting Condition		
	Recommended Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)
Aluminium	1000 (200—1500)	-0.2	-3.0
Aluminium Alloy (Si ≤ 16%)	800 (200—1200)	-0.2	-3.0
Aluminium Alloy (Si ≥ 16%)	600 (200—1000)	-0.2	-3.0
Copper Alloy	700 (200—1200)	-0.2	-3.0
Strengthened Plastic	600 (100—1000)	-0.4	-2.0
Glass Fibre Reinforced Plastic	500 (100—800)	-0.25	-2.0
Carbon	400 (100—600)	-0.3	-2.0
Ceramics	50 (30—80)	-0.1	-2.0
Hard Rubber	600 (300—800)	-0.15	-1.0
Wood Inorganic Board	1300 (300—4000)	-0.4	-
Cemented Carbide	15 (5—20)	-0.2	-0.5

(Note1) ◎:1st recommendation. ○: 2nd recommendation.  
(Note2) Not suitable for steel.

## CUTTING PERFORMANCE



<Cutting Conditions>  
Workpiece:High Si Aluminium Alloy  
Tool:P11R,SPGN120308  
vc=200m/min  
ap=1.5mm  
f=0.15mm/rev  
Coolant:W.S.O

## NEW PETIT CUT INSERT SERIES

### FEATURES

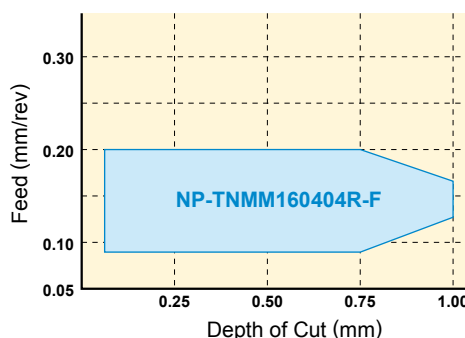
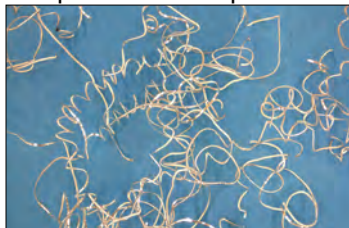
- **Economical** The small PCD tip delivers long tool life. Eliminates the need for regrinding, making tool management easier and economical.
- **With Breaker** Chip breaker formed directly on the PCD portion delivers superior chip control.
- **NEW** Corner R0.05 inserts are available, making it suitable for the machining of small work corner radii.

## CUTTING PERFORMANCE

### Chips when using a chip breaker



### Chips made when no chip breaker used



<Cutting Conditions>  
Workpiece : Aluminium alloy  
Cutting Speed : 340m/min  
Feed : 0.1mm/rev

Depth of Cut : 0.1mm  
Dry Cutting

<Cutting Conditions>  
Workpiece : Aluminium alloy  
Cutting Speed : 400m/min  
Wet Cutting

# CLASSIFICATION (CBN)

CBN

CLASSIFICATION (CBN) TURNING INSERTS

## NEGATIVE INSERTS WITH HOLE

Type	Tolerance	Breaker Name and Cross Section	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°	
Multi-corner Type Double Sided	G	Flat Top	NP-CNGA_004 	NP-DNGA_004 	NP-SNGA_004 	NP-TNGA_006 	NP-VNGA_004 	NP-WNGA_006 	
Multi-corner Type Double Sided With Wiper		Flat Top	NP-CNGA_00W4 					NP-WNGA_00W6 	
Multi-corner Type Double Sided With Breaker		BF	BF-CNGG_004 	BF-DNGG_004 					
Multi-corner Type Single Sided		Flat Top	NP-CNGA_002 	NP-DNGA_002 	NP-SNGA_002 	NP-TNGA_003 	NP-VNGA_002 	NP-WNGA_003 	
Multi-corner Type Single Sided With Wiper		Flat Top	NP-CNGA_00W2 	NP-DNGA_GAW2J_R/L _GOWS2J_R/L 				NP-WNGA_00W3 _00GAWS3 	
Multi-corner Type Single Sided With Breaker		BF	BF-CNGM_002 	BF-DNGM_002 					

## NEGATIVE INSERTS WITHOUT HOLE

Type	Tolerance	Breaker Name and Cross Section	Rhombic 80°	Rhombic 55°	Round	Square 90°	Triangular 60°
Multi-corner Type Double Sided (Solid CBN)	G	Flat Top	CNGN 	DNGN 	RNGN 	SNGN 	TNGN 
			B026 	B026 	B026 	B027 	B027 

## 5° POSITIVE INSERTS WITH HOLE

Type	Tolerance	Breaker Name and Cross Section	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°
Multi-corner Type Single Sided	G	Flat Top					NP-VBGW_002 	
							B035 	

## 7° POSITIVE INSERTS WITH HOLE

Type	Tolerance	Breaker Name and Cross Section	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°
Multi-corner Type Single Sided	G	Flat Top	NP-CCGW/B <sub>002</sub>  ➔ B028	NP-DCGW <sub>002</sub>  ➔ B031		NP-TCGW <sub>003</sub>  ➔ B033	NP-VCGW <sub>002</sub>  ➔ B036	
		Flat Top	NP-CCGW <sub>00W2</sub>  ➔ B029					
Multi-corner Type Single Sided With Wiper	G	Flat Top	NP-CCGW <sub>00W2</sub>  ➔ B029					
Multi-corner Type Single Sided With Breaker		BF	BF-CCGT <sub>002</sub>  ➔ B029	BF-DCGT <sub>002</sub>  ➔ B031				
One-corner Type Single Sided	M	Flat Top	NP-CCGW <sub>00</sub>  ➔ B028	NP-DCGW <sub>00</sub>  ➔ B032		NP-TCGW <sub>00</sub>  ➔ B033		
One-corner Type Single Sided		Flat Top						NP-WCMWL <sub>00</sub>  ➔ B036

## 11° POSITIVE INSERTS WITH HOLE

Type	Tolerance	Breaker Name and Cross Section	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°
Multi-corner Type Single Sided	G	Flat Top	NP-CPGB <sub>002</sub>  ➔ B030			NP-TPGB <sub>003</sub>  ➔ B034		
Multi-corner Type Single Sided		Flat Top				NP-TPGX <sub>003</sub>  ➔ B034		

## 5° POSITIVE INSERTS WITHOUT HOLE

Type	Tolerance	Breaker Name and Cross Section	Triangular 60°
Multi-corner Type Single Sided	G	Flat Top	TBGN  ➔ B038

## 11° POSITIVE INSERTS WITHOUT HOLE

Type	Tolerance	Breaker Name and Cross Section	Square 90°	Triangular 60°
One-corner Type Single Sided	G	Flat Top	SPGN  ➔ B037	TPGN  ➔ B038

## SPECIAL PURPOSE INSERTS

Tool Holder Type	GY Type	DG Type	MG Type	TL Type
Tolerance	G			
Inserts	 ➔ B040	 ➔ B039	 ➔ B041	 ➔ B037

# CLASSIFICATION (PCD)

PCD

CLASSIFICATION (PCD) TURNING INSERTS

## NEGATIVE INSERTS WITH HOLE

Product Name	Type	Tolerance	Breaker Name and Cross Section	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°
NEW PETIT CUT	One-corner Type Single Sided With Breaker	M	R/L-F	NP-CNMM_R-F	NP-DNMM_R-F	NP-SNMM_R-F	NP-TNMM_R-F	NP-VNMM_R-F	
STANDARD	One-corner Type Single Sided	M	Flat Top	CNMA					
STANDARD	One-corner Type Single Sided	G	Flat Top		DNGA	SNGA	TNGA	VNGA	

## NEGATIVE INSERTS WITHOUT HOLE

Type	Tolerance	Breaker Name and Cross Section	Square 90°
One-corner Type Single Sided	G	Flat Top	SNGN








## 5° POSITIVE INSERTS WITH HOLE

Product Name	Type	Tolerance	Breaker Name and Cross Section	Rhombic 35°
NEW PETIT CUT	NEW One-corner Type Single Sided With Breaker	G	R-F	NP-VBGT_R-F


## 7° POSITIVE INSERTS WITH HOLE

Product Name	Type	Tolerance	Breaker Name and Cross Section	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°
NEW PETIT CUT	One-corner Type Single Sided With Breaker	M	Standard	NP-CCMH					
	One-corner Type Single Sided	M	Flat Top	NP-CCMW					
NEW PETIT CUT	One-corner Type Single Sided With Breaker	G	R/L-F		NP-DCMT_R/L-F				
NEW PETIT CUT	One-corner Type Single Sided With Breaker	G	R-F					NP-VCGT_R-F	
STANDARD	One-corner Type Single Sided	M	Flat Top	CCMW	DCMW		TCMW TCGW		WCMW
STANDARD	One-corner Type Single Sided	G	Flat Top						


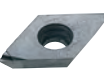

**11° POSITIVE INSERTS WITH HOLE**

Product Name	Type	Tolerance	Breaker Name and Cross Section	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°
NEW PETIT CUT	One-corner Type Single Sided With Breaker	M	Standard	NP-CPMH  ↻ B047					
	One-corner Type Single Sided With Breaker		R/L-F				NP-TPMX_R/L-F  ↻ B049		
	One-corner Type Single Sided With Breaker		R/L-F				NP-TPMH_R/L-F  ↻ B049		
STANDARD	One-corner Type Single Sided With Breaker	G	Standard	CPGT  ↻ B047					WPGT  ↻ B051
	One-corner Type Single Sided		Flat Top			SPGX  ↻ B048	TPGX  ↻ B049		



**15° POSITIVE INSERTS WITH HOLE**

Type	Tolerance	Breaker Name and Cross Section	Rhombic 35°
One-corner Type Single Sided (For Aluminium) With Breaker	G	R/L	VDGX_R/L-F  ↻ B050

**20° POSITIVE INSERTS WITH HOLE**

Type	Tolerance	Breaker Name and Cross Section	Rhombic 55°	Triangular 60°
One-corner Type Single Sided (For Aluminium) With Breaker	G	R/L		TEGX_R/L  ↻ B048
One-corner Type Single Sided (For Aluminium) With Breaker		R/L-F	DEGX_R/L-F  ↻ B047	
One-corner Type Single Sided (For Aluminium)		Flat Top		TEGX  ↻ B048

**11° POSITIVE INSERTS WITHOUT HOLE**

Type	Tolerance	Breaker Name and Cross Section	Square 90°	Triangular 60°
One-corner Type Single Sided	G	Flat Top	SPGN  ↻ B052	TPGN  ↻ B053

# CBN TURNING INSERTS [NEGATIVE]

## 80° CN TYPE INSERTS WITH HOLE

CBN TURNING INSERTS

NEG WITH HOLE

C

D


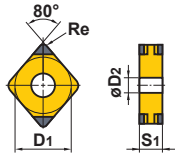

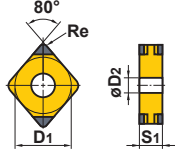

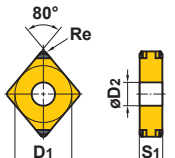

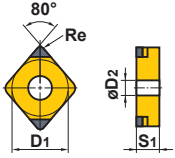
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
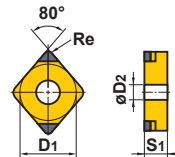

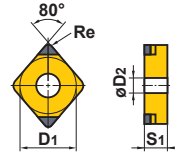

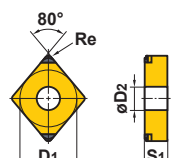
W

Work Material	H	Hardened Materials	Cutting Conditions (Guide) :						Dimensions (mm)	Geometry	Applicable Holder Page									
	K	Cast Iron	●	●	●	✦	Honing (Last letter of order number) :													
Shape	S	Heat-resistant Alloy, Titanium Alloy	Please refer to page B009						Coated CBN				CBN				NEW			
		Sintered Alloy	MBC010	MBC020	MB8025	MB835	MB710	MB730	MB4020	D1	S1	Re	D2							
NEW PETIT CUT 	NP-CNGA120404GA4	●							12.7	4.76	0.4	5.16					C008 C009 E014 E037 E043 H006 -008			
	120408GA4	●							12.7	4.76	0.8	5.16								
	120412GA4	●							12.7	4.76	1.2	5.16								
	120404GN4	★							12.7	4.76	0.4	5.16								
	120408GN4	★							12.7	4.76	0.8	5.16								
	120412GN4	★							12.7	4.76	1.2	5.16								
	120408FS4	●							12.7	4.76	0.8	5.16								
	120412FS4	●							12.7	4.76	1.2	5.16								
	120404TA4	●							12.7	4.76	0.4	5.16								
	120408TA4	●							12.7	4.76	0.8	5.16								
	120412TA4	●							12.7	4.76	1.2	5.16								
	120408TN4	●							12.7	4.76	0.8	5.16								
120412TN4	●							12.7	4.76	1.2	5.16									
NEW PETIT CUT (With Wiper) * 	NP-CNGA120408GAWC4	●							12.7	4.76	0.8	5.16					C008 C009 E014 E037 E043 H006 -008			
	120412GAWC4	●							12.7	4.76	1.2	5.16								
	120404GAW4	●							12.7	4.76	0.4	5.16								
	120408GAW4	●							12.7	4.76	0.8	5.16								
	120412GAW4	●							12.7	4.76	1.2	5.16								
	120408GSWC4	●							12.7	4.76	0.8	5.16								
120412GSWC4	●							12.7	4.76	1.2	5.16									
NEW PETIT CUT  (With Breaker)	BF-CNGG120404TA4	★							12.7	4.76	0.4	5.16					C008 C009 E014 E037 E043 H006 -008			
	120408TA4	★							12.7	4.76	0.8	5.16								
	120412TA4	★							12.7	4.76	1.2	5.16								
NEW PETIT CUT 	NP-CNGA120404GA2	★	●		●	●			12.7	4.76	0.4	5.16					C008 C009 E014 E037 E043 H006 -008			
	120408GA2	★	●						12.7	4.76	0.8	5.16								
	120412GA2	★	●						12.7	4.76	1.2	5.16								
	120404GS2	●				●	●	●	12.7	4.76	0.4	5.16								
	120408GS2	●		●		●	●	●	12.7	4.76	0.8	5.16								
	120412GS2	●		●		●	●	●	12.7	4.76	1.2	5.16								
	120404GN2	★							12.7	4.76	0.4	5.16								
	120408GN2	★							12.7	4.76	0.8	5.16								
	120412GN2	★							12.7	4.76	1.2	5.16								
	120404FS2					●		●	12.7	4.76	0.4	5.16								
	120408FS2	●		●		●		●	12.7	4.76	0.8	5.16								
	120412FS2	●		●		●		●	12.7	4.76	1.2	5.16								
	120404TA2	★	●	●		★			12.7	4.76	0.4	5.16								
	120408TA2	★	●	●		●			12.7	4.76	0.8	5.16								
120412TA2	★	●	●		●			12.7	4.76	1.2	5.16									

\* Please refer to B012 before using wiper inserts.



● : Inventory maintained. ★ : Inventory maintained in Japan.

Work Material	H	Hardened Materials	●	●	●	●	●	●	●	<b>Cutting Conditions (Guide) :</b> ● : Stable Cutting ● : General Cutting ✖ : Unstable Cutting <b>Honing (Last letter of order number) :</b> Please refer to page B009					
	K	Cast Iron													
Shape	S	Heat-resistant Alloy, Titanium Alloy								Dimensions (mm) D1 S1 Re D2					
		Sintered Alloy													
Order Number	Coated CBN		CBN				Geometry				Applicable Holder Page				
	MBC010	MBC020	MB8025	MB835	MB710	MB730	MB4020								
NEW PETIT CUT 	NP-CNGA120404TS2						★			12.7	4.76	0.4	5.16		C008 C009 E014 E037 E043 H006 -008
	120408TS2						★			12.7	4.76	0.8	5.16		
	120412TS2						★			12.7	4.76	1.2	5.16		
	120404TN2				●					12.7	4.76	0.4	5.16		
	120408TN2				●					12.7	4.76	0.8	5.16		
	120412TN2				●					12.7	4.76	1.2	5.16		
NEW PETIT CUT (With Wiper) * 	NP-CNGA120404GAWS2		●	★						12.7	4.76	0.4	5.16		C008 C009 E014 E037 E043 H006 -008
	120408GAWS2		●	★						12.7	4.76	0.8	5.16		
	120412GAWS2		●	★						12.7	4.76	1.2	5.16		
	120408GAWC2			●						12.7	4.76	0.8	5.16		
	120404GAW2			★	●					12.7	4.76	0.4	5.16		
	120408GAW2			★	●					12.7	4.76	0.8	5.16		
	120412GAW2			★	●					12.7	4.76	1.2	5.16		
	NEW 120404GSWS2		●	●						12.7	4.76	0.4	5.16		
	NEW 120408GSWS2		●	●						12.7	4.76	0.8	5.16		
	NEW 120412GSWS2		●	●						12.7	4.76	1.2	5.16		
	120404GSWC2		●							12.7	4.76	0.4	5.16		
	120408GSWC2		●	●						12.7	4.76	0.8	5.16		
	120412GSWC2			●						12.7	4.76	1.2	5.16		
	120408GSW2		●							12.7	4.76	0.8	5.16		
	120412GSW2		●							12.7	4.76	1.2	5.16		
120408FAW2					●				12.7	4.76	0.8	5.16			
120412FAW2					●				12.7	4.76	1.2	5.16			
120408FSW2		●							12.7	4.76	0.8	5.16			
NEW PETIT CUT (With Breaker) 	BF-CNGM120404TA2		●							12.7	4.76	0.4	5.16		C008 C009 E014 E037 E043 H006 -008
	120408TA2		●							12.7	4.76	0.8	5.16		
	120412TA2		●							12.7	4.76	1.2	5.16		

\* Please refer to B012 before using wiper inserts.





# CBN TURNING INSERTS [NEGATIVE]

## 90° SN TYPE INSERTS WITH HOLE

CBN TURNING INSERTS

NEG WITH HOLE

C

D


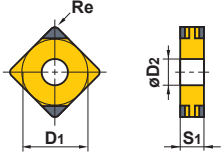

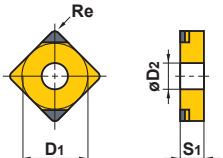
R

S

T


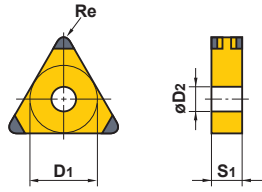

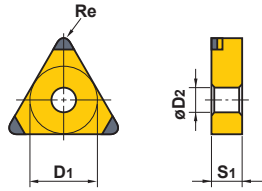
V

W

Work Material	H	Hardened Materials	●	●	●	✦					Cutting Conditions (Guide) : ● : Stable Cutting ● : General Cutting ✦ : Unstable Cutting Honing (Last letter of order number) : Please refer to page B009			
	K	Cast Iron					●	●						
Sintered Alloy	S	Heat-resistant Alloy, Titanium Alloy												
		Sintered Alloy												
Shape	Order Number	Coated CBN	CBN				Dimensions (mm)				Geometry	Applicable Holder Page		
		MBC010	MBC020	MB8025	MB835	MB710	MB730	MB4020	D1	S1			Re	D2
NEW PETIT CUT 	NP-SNGA120404GA4	★							12.7	4.76	0.4	5.16		C012 -015 E015
	120408GA4	★							12.7	4.76	0.8	5.16		
	120412GA4	★							12.7	4.76	1.2	5.16		
NEW PETIT CUT 	NP-SNGA120404GA2				●				12.7	4.76	0.4	5.16		C012 -015 E015
	120408GA2				●				12.7	4.76	0.8	5.16		
	120412GA2				●				12.7	4.76	1.2	5.16		
	120404GS2	●					●		12.7	4.76	0.4	5.16		
	120408GS2	●				●	●	●	12.7	4.76	0.8	5.16		
	120412GS2	●				●	●	●	12.7	4.76	1.2	5.16		
	120404FS2							●	12.7	4.76	0.4	5.16		
	120408FS2							●	12.7	4.76	0.8	5.16		
	120412FS2							●	12.7	4.76	1.2	5.16		
	120404TS2							★	12.7	4.76	0.4	5.16		
	120408TS2							★	12.7	4.76	0.8	5.16		
	120412TS2							★	12.7	4.76	1.2	5.16		

● : Inventory maintained. ★ : Inventory maintained in Japan.

# 60° TN TYPE INSERTS WITH HOLE

Work Material	H	Hardened Materials	●	●	●	✦					<b>Cutting Conditions (Guide) :</b> ● : Stable Cutting ● : General Cutting ✦ : Unstable Cutting <b>Honing (Last letter of order number) :</b> Please refer to page B009			
	K	Cast Iron					●	●						
S	Heat-resistant Alloy, Titanium Alloy									●				
	Sintered Alloy									●				
Shape	Order Number	Coated CBN	CBN					Dimensions (mm)				Geometry	Applicable Holder Page	
		MBC010	MBC020	MB8025	MB835	MB710	MB730	MB4020	D1	S1	Re			D2
	NP-TNGA160404GA6	★							9.525	4.76	0.4	3.81		C016-018 E015 E036 E042
	160408GA6	●							9.525	4.76	0.8	3.81		
	160412GA6	●							9.525	4.76	1.2	3.81		
	160404GN6	★							9.525	4.76	0.4	3.81		
	160408GN6	★							9.525	4.76	0.8	3.81		
	160412GN6	★							9.525	4.76	1.2	3.81		
	160404TA6	★							9.525	4.76	0.4	3.81		
	160408TA6	●							9.525	4.76	0.8	3.81		
	160412TA6	★							9.525	4.76	1.2	3.81		
	160408TN6	●							9.525	4.76	0.8	3.81		
	NP-TNGA160402GA3	★							9.525	4.76	0.2	3.81		C016-018 E015 E036 E042
	160404GA3	★	●						9.525	4.76	0.4	3.81		
	160408GA3	★	●						9.525	4.76	0.8	3.81		
	160412GA3	★	●						9.525	4.76	1.2	3.81		
	160404GS3	●					●		9.525	4.76	0.4	3.81		
	160408GS3	●			●	●	●		9.525	4.76	0.8	3.81		
	160412GS3	●			●	●	●		9.525	4.76	1.2	3.81		
	160402GN3	★							9.525	4.76	0.2	3.81		
	160404GN3	★							9.525	4.76	0.4	3.81		
	160408GN3	★							9.525	4.76	0.8	3.81		
	160404FS3						●		9.525	4.76	0.4	3.81		
	160408FS3						●		9.525	4.76	0.8	3.81		
	160412FS3						●		9.525	4.76	1.2	3.81		
	160404TA3	★							9.525	4.76	0.4	3.81		
	160408TA3	★	●	●					9.525	4.76	0.8	3.81		
	160412TA3	★	●						9.525	4.76	1.2	3.81		
	160404TS3						★		9.525	4.76	0.4	3.81		
	160408TS3						★		9.525	4.76	0.8	3.81		
	160412TS3						★		9.525	4.76	1.2	3.81		
	160408TN3		●						9.525	4.76	0.8	3.81		
160412TN3		●						9.525	4.76	1.2	3.81			

**CBN**

CBN TURNING INSERTS

**NEG**

WITH HOLE

C

D

R

S

T

V

W

# CBN TURNING INSERTS [NEGATIVE]

## 35° VN TYPE INSERTS WITH HOLE

CBN

TURNING INSERTS

NEG

WITH HOLE

C

D


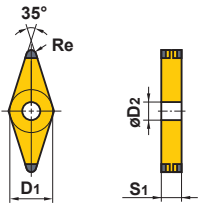

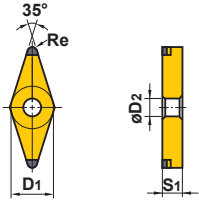
R

S

T

V

W

Work Material	H	Hardened Materials	Cutting Conditions (Guide) :						Cutting Conditions (Guide) : ● : Stable Cutting ● : General Cutting ✖ : Unstable Cutting Honing (Last letter of order number) : Please refer to page B009					
	K	Cast Iron	●	●	✖	●	●	●						
Sintered Alloy	S	Heat-resistant Alloy, Titanium Alloy	Honing (Last letter of order number) :						Please refer to page B009					
			●	●	✖	●	●	●						
Shape	Order Number	Coated CBN	CBN				Dimensions (mm)				Geometry	Applicable Holder Page		
		MBC010	MBC020	MB8025	MB835	MB710	MB730	MB4020	D1	S1			Re	D2
NEW PETIT CUT 	NP-VNGA160404GA4	●							9.525	4.76	0.4	3.81		C019 -021 E016 E044
	160408GA4	●							9.525	4.76	0.8	3.81		
NEW PETIT CUT 	NP-VNGA160402GA2	★							9.525	4.76	0.2	3.81		C019 -021 E016 E044
	160404GA2	★ ●							9.525	4.76	0.4	3.81		
	160408GA2	★ ●							9.525	4.76	0.8	3.81		
	160404GS2	●					●		9.525	4.76	0.4	3.81		
	160408GS2	●					●		9.525	4.76	0.8	3.81		
	160402GN2	★							9.525	4.76	0.2	3.81		
	160404FS2							●	9.525	4.76	0.4	3.81		
	160408FS2							●	9.525	4.76	0.8	3.81		
	160404TS2							★	9.525	4.76	0.4	3.81		
160408TS2							★	9.525	4.76	0.8	3.81			

● : Inventory maintained. ★ : Inventory maintained in Japan.



# CBN TURNING INSERTS [NEGATIVE]

## 80° CN TYPE INSERTS WITHOUT HOLE

CBN TURNING INSERTS

NEG WITHOUT HOLE

C

D


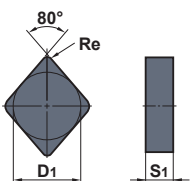
R

S


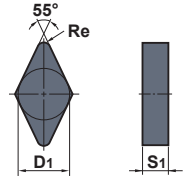
T

V


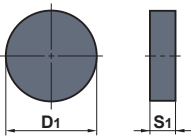
W

Work Material	K	Cast Iron	✱	Cutting Conditions (Guide) :			Geometry	Applicable Holder Page
				● : Stable Cutting	● : General Cutting	✱ : Unstable Cutting		
Shape	Order Number	Solid CBN	MBS140	Dimensions (mm)			Geometry	Applicable Holder Page
				D1	S1	Re		
	CNGN120404	●		12.7	4.76	0.4		-
	120408	●		12.7	4.76	0.8		
	120412	●		12.7	4.76	1.2		

## 55° DN TYPE INSERTS WITHOUT HOLE


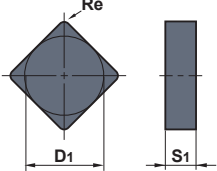
Work Material	K	Cast Iron	✱	Cutting Conditions (Guide) :			Geometry	Applicable Holder Page
				● : Stable Cutting	● : General Cutting	✱ : Unstable Cutting		
Shape	Order Number	Solid CBN	MBS140	Dimensions (mm)			Geometry	Applicable Holder Page
				D1	S1	Re		
	DNGN110308	★		9.525	3.18	0.8		-
	110312	★		9.525	3.18	1.2		

## RN TYPE INSERTS WITHOUT HOLE


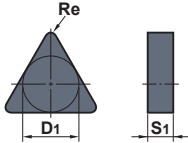
Work Material	K	Cast Iron	✱	Cutting Conditions (Guide) :			Geometry	Applicable Holder Page
				● : Stable Cutting	● : General Cutting	✱ : Unstable Cutting		
Shape	Order Number	Solid CBN	MBS140	Dimensions (mm)			Geometry	Applicable Holder Page
				D1	S1	Re		
	RNGN090300	●		9.525	3.18	-		-
	120300	●		12.7	3.18	-		
	120400	●		12.7	4.76	-		

● : Inventory maintained. ★ : Inventory maintained in Japan.

# 90° SN TYPE INSERTS WITHOUT HOLE

Work Material	K	Cast Iron	✱	Cutting Conditions (Guide) :			Geometry	Applicable Holder Page
				● : Stable Cutting	● : General Cutting	✱ : Unstable Cutting		
Shape	Order Number	Solid CBN	MBS140	Dimensions (mm)			Geometry	Applicable Holder Page
				D1	S1	Re		
	<b>SNGN090308</b>	●		9.525	3.18	0.8		-
	<b>090312</b>	●		9.525	3.18	1.2		
	<b>090316</b>	●		9.525	3.18	1.6		
	<b>090408</b>	★		9.525	4.76	0.8		
	<b>090412</b>	★		9.525	4.76	1.2		
	<b>120408</b>	●		12.7	4.76	0.8		
	<b>120412</b>	●		12.7	4.76	1.2		
	<b>120416</b>	●		12.7	4.76	1.6		

# 60° TN TYPE INSERTS WITHOUT HOLE

Work Material	K	Cast Iron	✱	Cutting Conditions (Guide) :			Geometry	Applicable Holder Page
				● : Stable Cutting	● : General Cutting	✱ : Unstable Cutting		
Shape	Order Number	Solid CBN	MBS140	Dimensions (mm)			Geometry	Applicable Holder Page
				D1	S1	Re		
	<b>TNGN160408</b>	●		9.525	4.76	0.8		-
	<b>160412</b>	●		9.525	4.76	1.2		
	<b>160416</b>	●		9.525	4.76	1.6		

CBN

TURNING INSERTS

NEG

WITHOUT HOLE

C

D

R

S

T

V

W

GRADES  
B008

IDENTIFICATION  
B002

B027

# CBN TURNING INSERTS [POSITIVE]

## 80° CC TYPE INSERTS WITH HOLE

CBN TURNING INSERTS

POSIT 7° WITH HOLE

C

D


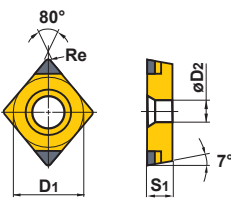

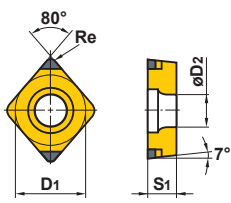
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S

T


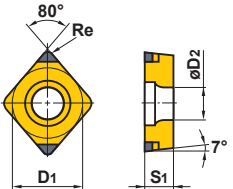

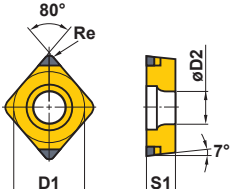

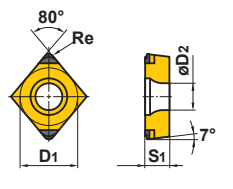

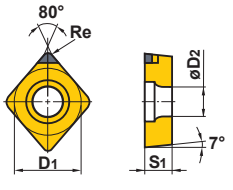
V

W

Work Material	H	Hardened Materials	Cutting Conditions (Guide) :						Geometry	Applicable Holder Page				
	K	Cast Iron	●	●	●	●	●	●						
Sintered Alloy	S	Heat-resistant Alloy, Titanium Alloy	Honing (Last letter of order number) :						Geometry	Applicable Holder Page				
			●	●	●	●	●	●						
Shape	Order Number	Coated CBN	CBN				Dimensions (mm)				Geometry	Applicable Holder Page		
		MBC010	MBC020	MB8025	MB835	MB710	MB730	MB4020	D1	S1			Re	D2
NEW PETIT CUT 	NP-CCGB060204GA2	★	●						6.35	2.38	0.4	2.8		C024 D008 E007 E031 E035
	060204GS2	●							6.35	2.38	0.4	2.8		
	060204FS2	●	●						6.35	2.38	0.4	2.8		
NEW PETIT CUT 	NP-CCGW060202GA2	●	●						6.35	2.38	0.2	2.8		C024 D008 E007 E031 E035
	060204GA2	●	●			●			6.35	2.38	0.4	2.8		
	060208GA2	●	●						6.35	2.38	0.8	2.8		
	09T302GA2	●	●						9.525	3.97	0.2	4.4		
	09T304GA2	●	●			●			9.525	3.97	0.4	4.4		
	09T308GA2	●	●						9.525	3.97	0.8	4.4		
	09T312GA2	●	●						9.525	3.97	1.2	4.4		
	120404GA2	●	●						12.7	4.76	0.4	5.5		
	120408GA2	●	●						12.7	4.76	0.8	5.5		
	060202GS2	●				★	★		6.35	2.38	0.2	2.8		
	060204GS2	●				●	●	●	6.35	2.38	0.4	2.8		
	060208GS2					●	●	●	6.35	2.38	0.8	2.8		
	09T304GS2	●	●	●		●	●	●	9.525	3.97	0.4	4.4		
	09T308GS2	●	●	●		●	●	●	9.525	3.97	0.8	4.4		
	09T312GS2	●							9.525	3.97	1.2	4.4		
	09T302GN2	★							9.525	3.97	0.2	4.4		
	09T304GN2	★							9.525	3.97	0.4	4.4		
	09T308GN2	★							9.525	3.97	0.8	4.4		
	060202FA2	●	●	●		●			6.35	2.38	0.2	2.8		
	060204FA2					●			6.35	2.38	0.4	2.8		
	060208FA2					●			6.35	2.38	0.8	2.8		
	060202FS2					●	★		6.35	2.38	0.2	2.8		
	060204FS2	●	●	●		●	●		6.35	2.38	0.4	2.8		
	060208FS2	●				●	●		6.35	2.38	0.8	2.8		
	09T302FS2	●	●	●			★		9.525	3.97	0.2	4.4		
	09T304FS2	●	●	●		●	●	●	9.525	3.97	0.4	4.4		
	09T308FS2	●	●			●	●	●	9.525	3.97	0.8	4.4		
	060202TA2		●	●					6.35	2.38	0.2	2.8		
	060204TA2		●	●	●				6.35	2.38	0.4	2.8		
	060208TA2		●	●					6.35	2.38	0.8	2.8		
	09T304TA2		●	●	●				9.525	3.97	0.4	4.4		
	09T308TA2		●	●	●				9.525	3.97	0.8	4.4		
060202TS2						★		6.35	2.38	0.2	2.8			
060204TS2						★		6.35	2.38	0.4	2.8			
060208TS2						★		6.35	2.38	0.8	2.8			
09T302TS2						★		9.525	3.97	0.2	4.4			
09T304TS2						★		9.525	3.97	0.4	4.4			
09T308TS2						★		9.525	3.97	0.8	4.4			

● : Inventory maintained. ★ : Inventory maintained in Japan.



Work Material	H	Hardened Materials	●	●	●	●	●	Cutting Conditions (Guide) : ● : Stable Cutting ● : General Cutting ✖ : Unstable Cutting				Geometry	Applicable Holder Page			
	K	Cast Iron														
Shape	S	Heat-resistant Alloy, Titanium Alloy	Coated CBN				CBN				Dimensions (mm)				Geometry	Applicable Holder Page
	Sintered Alloy															
Order Number	MBC010	MBC020	MB8025	MB835	MB710	MB730	MB4020	D1	S1	Re	D2	Geometry		Applicable Holder Page		
NEW PETIT CUT 	NP-CCGW09T304TN2		●					9.525	3.97	0.4	4.4			C024 D008 E007 E031 E035		
	09T308TN2	●	●					9.525	3.97	0.8	4.4					
NEW PETIT CUT (With Wiper) * 	NP-CCGW09T304GAWS2	●						9.525	3.97	0.4	4.4			C024 D008 E031 E035		
	09T308GAWS2	●	●					9.525	3.97	0.8	4.4					
	09T308GAWC2	●	●					9.525	3.97	0.8	4.4					
	09T308GAW2	●						9.525	3.97	0.8	4.4					
	120404GAW2		●					12.7	4.76	0.4	5.5					
	120408GAW2		●					12.7	4.76	0.8	5.5					
	09T304GSWS2	●	●					9.525	3.97	0.4	4.4					
	09T308GSWS2	●	●					9.525	3.97	0.8	4.4					
	09T304GSWC2	●	●	●				9.525	3.97	0.4	4.4					
	09T308GSWC2	●	●					9.525	3.97	0.8	4.4					
	09T304GSW2	●						9.525	3.97	0.4	4.4					
09T308GSW2	●						9.525	3.97	0.8	4.4						
09T308FSWC2	●						9.525	3.97	0.8	4.4						
NEW PETIT CUT 	BF-CCGT09T304TA2	●						9.525	3.97	0.4	4.4			C024 D008 E007 E031 E035		
	09T308TA2	●						9.525	3.97	0.8	4.4					
NEW PETIT CUT 	NP-CCGW03S102FA	●	●	●				3.57	1.39	0.2	2.0			E017		
	04T002FA	●	●	●				4.37	1.79	0.2	2.4					
	03S104FS	●	●	●				3.57	1.39	0.4	2.0					
	04T004FS	●	●	●				4.37	1.79	0.4	2.4					

\* Please refer to B012 before using wiper inserts.

# CBN TURNING INSERTS [POSITIVE]

## 80° CP TYPE INSERTS WITH HOLE

CBN

CBN TURNING INSERTS

POSIT 11°

WITH HOLE

C

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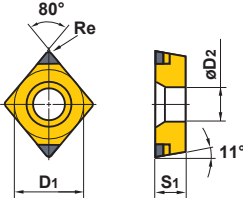
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Work Material	H	Hardened Materials	Cutting Conditions (Guide) :							Geometry	Applicable Holder Page			
	K	Cast Iron	●	●	●	✦	●	●	●					
Sintered Alloy	S	Heat-resistant Alloy, Titanium Alloy	Honing (Last letter of order number) :							Geometry	Applicable Holder Page			
			●	●	●	✦	●	●	●					
Shape	Order Number	Coated CBN	CBN				Dimensions (mm)				Geometry	Applicable Holder Page		
		MBC010	MBC020	MB8025	MB835	MB710	MB730	MB4020	D1	S1			Re	D2
	NEW PETIT CUT	NP-CPGB080204GA2	●	●					7.94	2.38	0.4	3.5		E007
		080208GA2	●	●					7.94	2.38	0.8	3.5		
		090304GA2	●	●					9.525	3.18	0.4	4.5		
		090308GA2	●	●					9.525	3.18	0.8	4.5		
		080204GS2	●						7.94	2.38	0.4	3.5		
		080208GS2	●						7.94	2.38	0.8	3.5		
		090304GS2	●						9.525	3.18	0.4	4.5		
		090308GS2	●						9.525	3.18	0.8	4.5		
		080202FS2						★	7.94	2.38	0.2	3.5		
		080204FS2	●	●				★	7.94	2.38	0.4	3.5		
		080208FS2	●	●					7.94	2.38	0.8	3.5		
		090302FS2						★	9.525	3.18	0.2	4.5		
		090304FS2	●	●				★	9.525	3.18	0.4	4.5		
	090308FS2	●	●				★	9.525	3.18	0.8	4.5			

● : Inventory maintained. ★ : Inventory maintained in Japan.



# CBN TURNING INSERTS [POSITIVE]

## 55° DC TYPE INSERTS WITH HOLE

CBN

CBN TURNING INSERTS

POSITIVE 7°

WITH HOLE

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Work Material	H	Hardened Materials							Cutting Conditions (Guide) :				Geometry	Applicable Holder Page	
	K	Cast Iron	●	●	●	●	●	●	●	●	●	●			●
S	Heat-resistant Alloy, Titanium Alloy		CBN						Dimensions (mm)				NEW		
	Sintered Alloy		Coated CBN						D1	S1	Re	D2			
NEW PETIT CUT	NP-DCGW11T302GS		MBC010	MBC020	MB8025	MB835	MB710	MB730	MB4020	9.525	3.97	0.2	4.4		C025 D009 D026 E009 E010 E030 E032

● : Inventory maintained. ★ : Inventory maintained in Japan.



# CBN TURNING INSERTS [POSITIVE]

## 60° TP TYPE INSERTS WITH HOLE

CBN

CBN TURNING INSERTS

POSITIVE 11°

WITH HOLE

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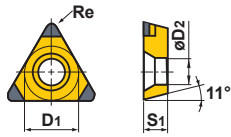

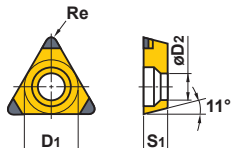
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Work Material	H	Hardened Materials	Cutting Conditions (Guide) :						Dimensions (mm)				Geometry	Applicable Holder Page
	K	Cast Iron	●	●	●	✦	●	●						
S	Heat-resistant Alloy, Titanium Alloy		Honing (Last letter of order number) :						Dimensions (mm)				Geometry	Applicable Holder Page
	Sintered Alloy		Please refer to page B009											
Shape	Order Number	Coated CBN		CBN				Dimensions (mm)				Geometry	Applicable Holder Page	
		MBC010	MBC020	MB8025	MB835	MB710	MB730	MB4020	D1	S1	Re			D2
NEW PETIT CUT 	NP-TPGB080204GA3	●	●						4.76	2.38	0.4	2.4		E008
	080208GA3	★	●						4.76	2.38	0.8	2.4		
	090204GA3	★	●						5.56	2.38	0.4	2.9		
	090208GA3	★	●						5.56	2.38	0.8	2.9		
	110304GA3	★	●						6.35	3.18	0.4	3.4		
	110308GA3	●	●						6.35	3.18	0.8	3.4		
	160304GA3	★	●						9.525	3.18	0.4	4.4		
	160308GA3	★	●						9.525	3.18	0.8	4.4		
	090202FS3							★	5.56	2.38	0.2	2.9		
	090204FS3							★	5.56	2.38	0.4	2.9		
	110302FS3							★	6.35	3.18	0.2	3.4		
	110304FS3							★	6.35	3.18	0.4	3.4		
110308FS3							★	6.35	3.18	0.8	3.4			
NEW PETIT CUT 	NP-TPGX080202GS3	●							4.76	2.38	0.2	2.5		E026
	080204GS3	●							4.76	2.38	0.4	2.5		
	090202GS3	●							5.56	2.38	0.2	3		
	090204GS3	●							5.56	2.38	0.4	3		
	110304GS3	●							6.35	3.18	0.4	3.5		
	110308GS3	●							6.35	3.18	0.8	3.5		
	080204TA3			●					4.76	2.38	0.4	2.5		
	090204TA3			●					5.56	2.38	0.4	3		
110304TA3			●					6.35	3.18	0.4	3.5			

● : Inventory maintained. ★ : Inventory maintained in Japan.



# 35° VB TYPE INSERTS WITH HOLE

Work Material	H	Hardened Materials	Cutting Conditions (Guide) :						Honing (Last letter of order number) :				
	K	Cast Iron	●	●	●	●	●	●	●	●	●	●	●
Shape	S	Heat-resistant Alloy, Titanium Alloy	Cutting Conditions (Guide) :						Honing (Last letter of order number) :				
		Sintered Alloy	●	●	●	●	●	●	●	●	●	●	●
Order Number	Coated CBN		CBN				Dimensions (mm)				Geometry	Applicable Holder Page	
	MBC010	MBC020	MB8025	MB835	MB710	MB730	MB4020	D1	S1	Re			D2
NEW PETIT CUT	<b>NP-VBGW160404GA2</b>	●	●					9.525	4.76	0.4	4.43		E012 H013
	<b>160408GA2</b>	●	●					9.525	4.76	0.8	4.43		
	<b>110304GS2</b>					★		6.35	3.18	0.4	2.85		
	<b>110308GS2</b>					★		6.35	3.18	0.8	2.85		
	<b>160404GS2</b>	●	●	●	●	●		9.525	4.76	0.4	4.43		
	<b>160408GS2</b>	●	●	●	●	●		9.525	4.76	0.8	4.43		
	<b>110304FS2</b>					★		6.35	3.18	0.4	2.85		
	<b>110308FS2</b>					★		6.35	3.18	0.8	2.85		
	<b>160404FS2</b>					●		9.525	4.76	0.4	4.43		
	<b>160408FS2</b>					●		9.525	4.76	0.8	4.43		
	<b>160404TA2</b>			●				9.525	4.76	0.4	4.43		
	<b>160408TA2</b>			●				9.525	4.76	0.8	4.43		
	<b>110304TS2</b>					★		6.35	3.18	0.4	2.85		
	<b>110308TS2</b>					★		6.35	3.18	0.8	2.85		
	<b>160404TS2</b>					★		9.525	4.76	0.4	4.43		
	<b>160408TS2</b>					★		9.525	4.76	0.8	4.43		

**CBN**

CBN TURNING INSERTS

**POSI 5°**

WITH HOLE

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# CBN TURNING INSERTS [POSITIVE]

## 35° VC TYPE INSERTS WITH HOLE




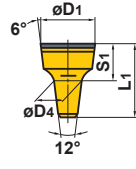
Work Material	H	Hardened Materials	●	●	●	✦				Cutting Conditions (Guide) : ● : Stable Cutting ● : General Cutting ✦ : Unstable Cutting Honing (Last letter of order number) : Please refer to page B009				
	K	Cast Iron					●	●						
Sintered Alloy	S	Heat-resistant Alloy, Titanium Alloy												
Shape	Order Number	Coated CBN	CBN				Dimensions (mm)				Geometry	Applicable Holder Page		
		MBC010	MBC020	MB8025	MB835	MB710	MB730	MB4020	D1	S1			Re	D2
NEW PETIT CUT 	NP-VCGW160404GA2	●	●						9.525	4.76	0.4	4.4	 35° Re D1 S1 øD2	C030 C031 E033 E034
	160408GA2	●	●						9.525	4.76	0.8	4.4		
	160404GS2	●							9.525	4.76	0.4	4.4		
	160408GS2	●							9.525	4.76	0.8	4.4		

## 80° WC TYPE INSERTS WITH HOLE

Work Material	H	Hardened Materials	●	●	●	✦				Cutting Conditions (Guide) : ● : Stable Cutting ● : General Cutting ✦ : Unstable Cutting Honing (Last letter of order number) : Please refer to page B009				
	K	Cast Iron					●	●						
Sintered Alloy	S	Heat-resistant Alloy, Titanium Alloy												
Shape	Order Number	Coated CBN	CBN				Dimensions (mm)				Geometry	Applicable Holder Page		
		MBC010	MBC020	MB8025	MB835	MB710	MB730	MB4020	D1	S1			Re	D2
	NP-WCMWL30204FA								4.76	2.38	0.4	2.3	 80° Re D1 S1 øD2 7°	E028
	L30208FA								4.76	2.38	0.8	2.3		

● : Inventory maintained. ★ : Inventory maintained in Japan.

# RTG TYPE INSERTS WITHOUT HOLE

Work Material	H	Hardened Materials	●	●	●	●	✦	●	●	Cutting Conditions (Guide) : ● : Stable Cutting ● : General Cutting ✦ : Unstable Cutting				
	K	Cast Iron						●	●					
Shape	S	Heat-resistant Alloy, Titanium Alloy												
		Sintered Alloy												
Order Number	Coated CBN		CBN					Dimensions (mm)				Geometry	Applicable Holder Page	
	MBC010	MBC020	MB8025	MB825	MB835	MB710	MB730	MB4020	D1	S1	L1			D4
	RTG05A			★					5	3.5	7.5	2.5		C038
	06A			★					6	3.5	7.5	3.5		
	07A				★				7	5	11	3.5		
	08A				★				8	5	11	4.5		
	10A				★				10	6.5	14	5.5		

**CBN**  
TURNING INSERTS

**POSI**  
6°  
11°  
WITHOUT HOLE

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R


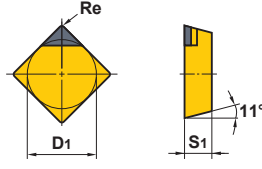
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W

# 90° SP TYPE INSERTS WITHOUT HOLE

Work Material	H	Hardened Materials	●	●	●	✦	●	●	Cutting Conditions (Guide) : ● : Stable Cutting ● : General Cutting ✦ : Unstable Cutting				
	K	Cast Iron					●	●					
Shape	S	Heat-resistant Alloy, Titanium Alloy											
		Sintered Alloy											
Order Number	Coated CBN		CBN					Dimensions (mm)			Geometry	Applicable Holder Page	
	MBC010	MBC020	MB8025	MB835	MB710	MB730	MB4020	D1	S1	Re			
	SPGN090304				★				9.525	3.18	0.4		-
	090308				★				9.525	3.18	0.8		
	120304				★	★			12.7	3.18	0.4		
	120308				★	★			12.7	3.18	0.8		

# CBN TURNING INSERTS [POSITIVE]

## 60° TB TYPE INSERTS WITHOUT HOLE

CBN

CBN TURNING INSERTS

POSITIVE  
5°  
11°  
WITHOUT HOLE

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
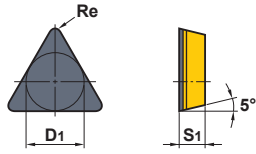
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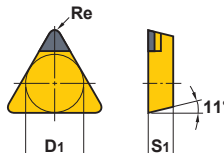
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W

Work Material	H	Hardened Materials	●	●	●	✦				Cutting Conditions (Guide) : ● : Stable Cutting ● : General Cutting ✦ : Unstable Cutting			
	K	Cast Iron					●	●					
Sintered Alloy	S	Heat-resistant Alloy, Titanium Alloy							●				
									●				
Shape	Order Number	Coated CBN	CBN				Dimensions (mm)			Geometry	Applicable Holder Page		
		MBC010	MBC020	MB8025	MB835	MB710	MB730	MB4020	D1			S1	Re
	TBGN060104								3.97	1.59	0.4		-
	060108					★			3.97	1.59	0.8		


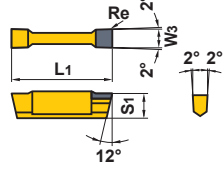
## 60° TP TYPE INSERTS WITHOUT HOLE

Work Material	H	Hardened Materials	●	●	●	✦				Cutting Conditions (Guide) : ● : Stable Cutting ● : General Cutting ✦ : Unstable Cutting			
	K	Cast Iron					●	●					
Sintered Alloy	S	Heat-resistant Alloy, Titanium Alloy							●				
									●				
Shape	Order Number	Coated CBN	CBN				Dimensions (mm)			Geometry	Applicable Holder Page		
		MBC010	MBC020	MB8025	MB835	MB710	MB730	MB4020	D1			S1	Re
	TPGN 110304								6.35	3.18	0.4		E027
	160304					★	★		9.525	3.18	0.4		
	160308					★	★		9.525	3.18	0.8		

★ : Inventory maintained in Japan.



# DGJ TYPE INSERTS WITHOUT HOLE

Work Material	H	Hardened Materials	Cutting Conditions (Guide) :						Dimensions (mm)	Geometry	Applicable Holder Page			
	K	Cast Iron	●	●	●	✦	●	●						
Shape	S	Heat-resistant Alloy, Titanium Alloy	Coated CBN						D1	W3	Re	L1	F096 F100	
		Sintered Alloy	MBC010	MBC020	MB8025	MB825	MB835	MB710						MB730
	<b>DGJ40CE</b>				★				6	4	0.2	25		F096 F100
	<b>50CE</b>				★				6	5	0.2	25		
	<b>60CE</b>				★				6	6	0.2	25		

**CBN**

CBN TURNING INSERTS

**POSI 12°**

WITHOUT HOLE

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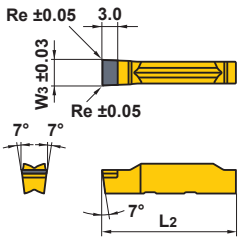
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# CBN TURNING INSERTS [POSITIVE]

## GY TYPE INSERTS WITHOUT HOLE NEW


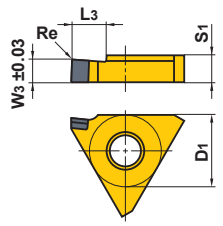
- CBN TURNING INSERTS
- POSITIVE 7°
- WITHOUT HOLE
- C
- D
- R
- S
- T
- V
- W

Work Material	H	Hardened Materials	Cutting Conditions (Guide) :						Dimensions (mm)			Geometry	Applicable Holder Page	
	K	Cast Iron	●	●	●	✦	●	●						●
Shape	S	Heat-resistant Alloy, Titanium Alloy	CBN						W <sub>3</sub>	Re	L <sub>2</sub>	F012-081		
		Sintered Alloy	Coated CBN	MBC010	MBC020	MB8025	MB835	MB710					MB730	
		GY1G0200D020N-GFGS			●					2.00	0.2	20.70		
		0239E020N-GFGS			●					2.39	0.2	20.70		
		0250E020N-GFGS			●					2.50	0.2	20.70		
		0300F020N-GFGS			●					3.00	0.2	20.70		
		0318F020N-GFGS			●					3.18	0.2	20.70		
		0400G020N-GFGS			●					4.00	0.2	25.65		
		0475H020N-GFGS			●					4.75	0.2	25.65		
	0500H020N-GFGS			●					5.00	0.2	25.65			

● : Inventory maintained. ★ : Inventory maintained in Japan.

# CBN TURNING INSERTS [NEGATIVE]

## MGTR TYPE INSERTS WITHOUT HOLE NEW

Work Material	H	Hardened Materials	Cutting Conditions (Guide) :						● : Stable Cutting ● : General Cutting ✦ : Unstable Cutting						
	K	Cast Iron	●	●	✦	●	●	●						●	
Shape	S	Heat-resistant Alloy, Titanium Alloy	Coated CBN						Dimensions (mm)					Geometry	Applicable Holder Page
	Sintered Alloy	MBC010	MBC020	MB8025	MB835	MB710	MB730	W <sub>3</sub>	L <sub>3</sub>	D <sub>1</sub>	S <sub>1</sub>	Re			
	<b>MGTR43125</b>			★				1.25	2.0	12.7	4.76	0.2	 <p>Right hand tool holder only.</p>	F121 F122	
	<b>43150</b>			★				1.50	3.5	12.7	4.76	0.2			
	<b>43200</b>				★				2.00	3.5	12.7	4.76			0.2
	<b>43250</b>				★				2.50	4.0	12.7	4.76			0.2
	<b>43300</b>				★				3.00	4.0	12.7	4.76			0.2
	<b>43350</b>				★				3.50	5.0	12.7	4.76			0.2
	<b>43400</b>				★				4.00	5.0	12.7	4.76			0.2

CBN TURNING INSERTS

**NEG**

WITHOUT HOLE

C

D

R

S

T


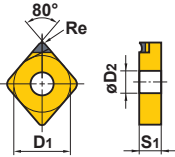

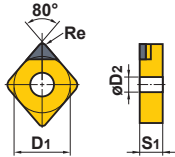
V

W


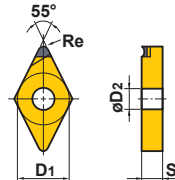

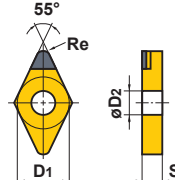
# PCD TURNING INSERTS [NEGATIVE]

## 80° CN TYPE INSERTS WITH HOLE




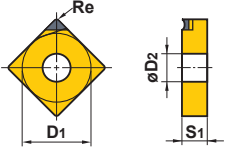

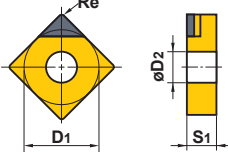
Work Material	N	Non-ferrous Metal	●	Cutting Conditions (Guide) :				PCD	Dimensions (mm)				Geometry	Applicable Holder Page
				● : Stable Cutting	● : General Cutting	✦ : Unstable Cutting	D1		S1	Re	D2			
Shape		Order Number	MD220											
 (With Breaker)	NEW PETIT CUT	NP-CNMM120402R-F	★	12.7	4.76	0.2	5.16		C008 C009 E014 E037 E043 H006 -008					
		120404R-F	★	12.7	4.76	0.4	5.16							
		120408R-F	★	12.7	4.76	0.8	5.16							
 (With Breaker)		CNMA 120404	★	12.7	4.76	0.4	5.16		C008 C009 E014 E037 E043 H006 -008					
		120408	★	12.7	4.76	0.8	5.16							

## 55° DN TYPE INSERTS WITH HOLE


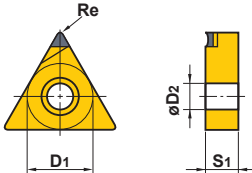

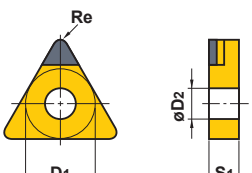
Work Material	N	Non-ferrous Metal	●	Cutting Conditions (Guide) :				PCD	Dimensions (mm)				Geometry	Applicable Holder Page
				● : Stable Cutting	● : General Cutting	✦ : Unstable Cutting	D1		S1	Re	D2			
Shape		Order Number	MD220											
 (With Breaker)	NEW PETIT CUT	NP-DNMM150402R-F	★	12.7	4.76	0.2	5.16		C010 C011 E014 E037 -039 E043 H009 -011					
		150404R-F	★	12.7	4.76	0.4	5.16							
		150408R-F	★	12.7	4.76	0.8	5.16							
 (With Breaker)		DNGA150404	★	12.7	4.76	0.4	5.16		C010 C011 E014 E037 -039 E043 H009 -011					
		150408	★	12.7	4.76	0.8	5.16							

★ : Inventory maintained in Japan.

# 90° SN TYPE INSERTS WITH HOLE

Work Material	N	Non-ferrous Metal	●	Cutting Conditions (Guide) :				Geometry	Applicable Holder Page
				● : Stable Cutting	● : General Cutting	✚ : Unstable Cutting			
Shape	Order Number	PCD	Dimensions (mm)				Geometry	Applicable Holder Page	
		MD220	D1	S1	Re	D2			
NEW PETIT CUT  (With Breaker)	NP-SNMM120404R-F	★	12.7	4.76	0.4	5.16		C012 -115 E015	
	120408R-F	★	12.7	4.76	0.8	5.16			
	SNGA 120408	★	12.7	4.76	0.8	5.16		C012 -115 E015	

# 60° TN TYPE INSERTS WITH HOLE

Work Material	N	Non-ferrous Metal	●	Cutting Conditions (Guide) :				Geometry	Applicable Holder Page
				● : Stable Cutting	● : General Cutting	✚ : Unstable Cutting			
Shape	Order Number	PCD	Dimensions (mm)				Geometry	Applicable Holder Page	
		MD220	D1	S1	Re	D2			
NEW PETIT CUT  (With Breaker)	NP-TNMM160402R-F	★	9.525	4.76	0.2	3.81		C016 -018 E015 E036 E042	
	160404R-F	★	9.525	4.76	0.4	3.81			
	160408R-F	★	9.525	4.76	0.8	3.81			
	TNGA160402	★	9.525	4.76	0.2	3.81		C016 -018 E015 E036 E042	
	160404	★	9.525	4.76	0.4	3.81			
	160408	★	9.525	4.76	0.8	3.81			

PCD  
TURNING INSERTS

NEG

WITH HOLE

C

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R

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W

# PCD TURNING INSERTS [NEGATIVE]

## 35° VN TYPE INSERTS WITH HOLE

PCD  
TURNING INSERTS

NEG

WITH HOLE

C

D


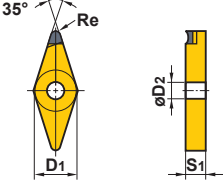

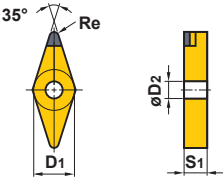
R

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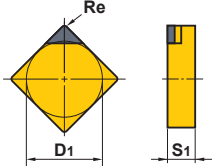
W

Work Material	N	Non-ferrous Metal	●	Cutting Conditions (Guide) :				Geometry	Applicable Holder Page
				● : Stable Cutting	● : General Cutting	✦ : Unstable Cutting			
Shape	Order Number	PCD	Dimensions (mm)				Geometry	Applicable Holder Page	
		MD220	D1	S1	Re	D2			
 NEW PETIT CUT (With Breaker)	NP-VNMM 160402R-F	★	9.525	4.76	0.2	3.81		C019 -021 E016 E044	
	160404R-F	★	9.525	4.76	0.4	3.81			
	160408R-F	★	9.525	4.76	0.8	3.81			
 VNGA	VNGA160404	★	9.525	4.76	0.4	3.81		C019 -021 E016 E044	
	160408	★	9.525	4.76	0.8	3.81			

★ : Inventory maintained in Japan.



# 90° SN TYPE INSERTS WITHOUT HOLE

Work Material	N	Non-ferrous Metal	Cutting Conditions (Guide) :				Applicable Holder Page
			● : Stable Cutting	● : General Cutting	✦ : Unstable Cutting		
Shape	Order Number	PCD	Dimensions (mm)			Geometry	
		MD220	D1	S1	Re		
	<b>SNGN120408</b>	★	12.7	4.76	0.8		-

PCD

PCD TURNING INSERTS

NEG

WITHOUT HOLE

C

D

R

S

T

V

W

GRADES  
B013

IDENTIFICATION  
B002

B045

# PCD TURNING INSERTS [POSITIVE]

## 80° CC TYPE INSERTS WITH HOLE




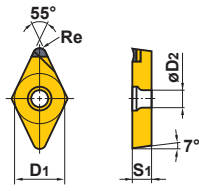

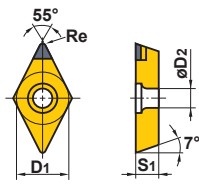
Work Material	N	Non-ferrous Metal	●	Cutting Conditions (Guide) :				PCD	Dimensions (mm)				Geometry	Applicable Holder Page
				● : Stable Cutting	● : General Cutting	✦ : Unstable Cutting	D1		S1	Re	D2			
NEW PETIT CUT	NP-CCMH060202	060204	★	6.35	2.38	0.2	2.8	80° D1	S1	7° øD2	C024 D008 E007 E031 E035			
			★	6.35	2.38	0.4	2.8							
(With Breaker)	NP-CCMW03S102	03S104	●	3.57	1.39	0.2	2.0	80° D1	S1	7° øD2	E017			
			★	3.57	1.39	0.4	2.0							
			●	4.37	1.79	0.2	2.4							
			★	4.37	1.79	0.4	2.4							
(With Breaker)	CCMW060202	060204	★	6.35	2.38	0.2	2.8	80° D1	S1	7° øD2	C024 D008 E007 E031 E035			
			★	6.35	2.38	0.4	2.8							
			★	9.525	3.97	0.2	4.4							
			★	9.525	3.97	0.4	4.4							

## 80° CP TYPE INSERTS WITH HOLE

Work Material	N	Non-ferrous Metal	●	Cutting Conditions (Guide) :				PCD	Dimensions (mm)				Geometry	Applicable Holder Page
				● : Stable Cutting	● : General Cutting	✦ : Unstable Cutting	D1		S1	Re	D2			
NEW PETIT CUT	NP-CPMH080202	080204	★	7.94	2.38	0.2	3.5	80° D1	S1	11° øD2	E007			
			★	7.94	2.38	0.4	3.5							
			★	9.525	3.18	0.2	4.5							
			★	9.525	3.18	0.4	4.5							
(With Breaker)	CPGT080202	080204	★	7.94	2.38	0.2	3.4	80° D1	S1	11° øD2	-			
			★	7.94	2.38	0.4	3.4							
			★	9.525	3.18	0.2	4.4							
			★	9.525	3.18	0.4	4.4							

● : Inventory maintained. ★ : Inventory maintained in Japan.

# 55° DC TYPE INSERTS WITH HOLE

Work Material	N	Non-ferrous Metal	●	Cutting Conditions (Guide) :				
				● : Stable Cutting	● : General Cutting	✦ : Unstable Cutting		
Shape	Order Number	PCD	Dimensions (mm)				Geometry	Applicable Holder Page
		MD220	D1	S1	Re	D2		
 (With Breaker)	<b>NP-DCMT 070202R-F</b>	★	6.35	2.38	0.2	2.8	 Left hand insert shown.	C025 D009 D026 E009 E010 E030 E032
	<b>070202L-F</b>	★	6.35	2.38	0.2	2.8		
	<b>070204R-F</b>	★	6.35	2.38	0.4	2.8		
	<b>070204L-F</b>	★	6.35	2.38	0.4	2.8		
	<b>11T302R-F</b>	★	9.525	3.97	0.2	4.4		
	<b>11T302L-F</b>	★	9.525	3.97	0.2	4.4		
	<b>11T304R-F</b>	★	9.525	3.97	0.4	4.4		
	<b>11T304L-F</b>	★	9.525	3.97	0.4	4.4		
	<b>DCMW070202</b>	★	6.35	2.38	0.2	2.8	 Right hand insert shown.	C025 D009 D026 E009 E010 E030 E032
	<b>070204</b>	★	6.35	2.38	0.4	2.8		
	<b>11T302</b>	★	9.525	3.97	0.2	4.4		
	<b>11T304</b>	★	9.525	3.97	0.4	4.4		

**PCD**

PCD TURNING INSERTS

**POSI**  
7°  
20°

WITH HOLE

C

D

R


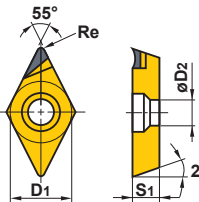
S

T

V

W

# 55° DE TYPE INSERTS WITH HOLE

Work Material	N	Non-ferrous Metal	●	Cutting Conditions (Guide) :				
				● : Stable Cutting	● : General Cutting	✦ : Unstable Cutting		
Shape	Order Number	PCD	Dimensions (mm)				Geometry	Applicable Holder Page
		MD220	D1	S1	Re	D2		
 (With Breaker)	<b>DEGX150402R-F</b>	★	12.7	4.76	0.2	5.1	 Right hand insert shown.	C034
	<b>150402L-F</b>	★	12.7	4.76	0.2	5.1		
	<b>150404R-F</b>	★	12.7	4.76	0.4	5.1		
	<b>150404L-F</b>	★	12.7	4.76	0.4	5.1		

# PCD TURNING INSERTS [POSITIVE]

## 90° SP TYPE INSERTS WITH HOLE

PCD  
TURNING INSERTS

POSI  
7°/11°  
20°  
WITH HOLE

C

D


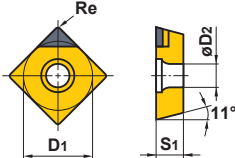
R

S


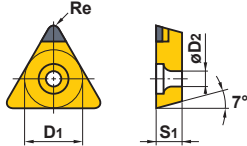

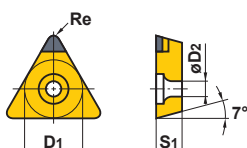
T

V


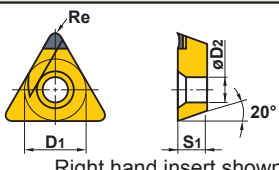

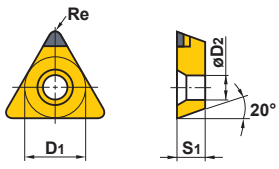
W

Work Material	N	Non-ferrous Metal	●	Cutting Conditions (Guide) :				Geometry	Applicable Holder Page
				● : Stable Cutting	● : General Cutting	✦ : Unstable Cutting			
Shape	Order Number	PCD	Dimensions (mm)				Geometry	Applicable Holder Page	
		MD220	D1	S1	Re	D2			
	SPGX090304	★	9.525	3.18	0.4	4.8		-	
	090308	★	9.525	3.18	0.8	4.8			

## 60° TC TYPE INSERTS WITH HOLE

Work Material	N	Non-ferrous Metal	●	Cutting Conditions (Guide) :				Geometry	Applicable Holder Page
				● : Stable Cutting	● : General Cutting	✦ : Unstable Cutting			
Shape	Order Number	PCD	Dimensions (mm)				Geometry	Applicable Holder Page	
		MD220	D1	S1	Re	D2			
	TCMW110202	★	6.35	2.38	0.2	2.8		C029 E029	
	110204	★	6.35	2.38	0.4	2.8			
	TCGW060102	★	3.97	1.59	0.2	2.3		C029 E029	
	060104	★	3.97	1.59	0.4	2.3			
	060108	★	3.97	1.59	0.8	2.3			

## 60° TE TYPE INSERTS WITH HOLE

Work Material	N	Non-ferrous Metal	●	Cutting Conditions (Guide) :				Geometry	Applicable Holder Page
				● : Stable Cutting	● : General Cutting	✦ : Unstable Cutting			
Shape	Order Number	PCD	Dimensions (mm)				Geometry	Applicable Holder Page	
		MD220	D1	S1	Re	D2			
	TEGX160302R	★	9.525	3.18	0.2	4.3		C035	
	160302L	★	9.525	3.18	0.2	4.3			
	160304R	★	9.525	3.18	0.4	4.3			
	160304L	★	9.525	3.18	0.4	4.3			
(With Breaker)							Right hand insert shown.		
	TEGX160302	★	9.525	3.18	0.2	4.3		C035	
	160304	★	9.525	3.18	0.4	4.3			

★ : Inventory maintained in Japan.

# 60° TP TYPE INSERTS WITH HOLE

Work Material	N	Non-ferrous Metal	●	Cutting Conditions (Guide) :				PCD	Dimensions (mm)	Geometry	Applicable Holder Page
				● : Stable Cutting	● : General Cutting	✦ : Unstable Cutting					
Shape	Order Number	MD220	PCD	D1	S1	Re	D2	Geometry		Applicable Holder Page	
	<b>NP-TPMX090202R-F</b>	★		5.56	2.38	0.2	3		E026		
	<b>090202L-F</b>	★		5.56	2.38	0.2	3				
	<b>090204L-F</b>	★		5.56	2.38	0.4	3				
	<b>090208L-F</b>	★		5.56	2.38	0.8	3				
	<b>110302L-F</b>	★		6.35	3.18	0.2	3.5				
	<b>110304L-F</b>	★		6.35	3.18	0.4	3.5				
	<b>110308L-F</b>	★		6.35	3.18	0.8	3.5				
	<b>160302L-F</b>	★		9.525	3.18	0.2	4.8				
	<b>160304L-F</b>	★		9.525	3.18	0.4	4.8				
	(With Breaker)	<b>160308L-F</b>	★		9.525	3.18	0.8			4.8	Right hand insert shown.
	<b>NP-TPMH080202R-F</b>	★		4.76	2.38	0.2	2.5		E008		
	<b>080202L-F</b>	★		4.76	2.38	0.2	2.5				
	<b>080204R-F</b>	★		4.76	2.38	0.4	2.5				
	<b>080204L-F</b>	★		4.76	2.38	0.4	2.5				
	<b>090202R-F</b>	★		5.56	2.38	0.2	2.9				
	<b>090202L-F</b>	★		5.56	2.38	0.2	2.9				
	<b>090204R-F</b>	★		5.56	2.38	0.4	2.9				
	<b>090204L-F</b>	★		5.56	2.38	0.4	2.9				
	<b>110302R-F</b>	★		6.35	3.18	0.2	3.4				
	<b>110302L-F</b>	★		6.35	3.18	0.2	3.4				
	<b>110304R-F</b>	★		6.35	3.18	0.4	3.4				
	<b>110304L-F</b>	★		6.35	3.18	0.4	3.4				
	<b>160302R-F</b>	★		9.525	3.18	0.2	4.4				
	<b>160302L-F</b>	★		9.525	3.18	0.2	4.4				
	(With Breaker)	<b>160304R-F</b>	★		9.525	3.18	0.4			4.4	Left hand insert shown.
		<b>TPGX080202</b>	★		4.76	2.38	0.2			2.5	
<b>080204</b>		★		4.76	2.38	0.4	2.5				
<b>080208</b>		★		4.76	2.38	0.8	2.5				
<b>090202</b>		★		5.56	2.38	0.2	3				
<b>090204</b>		★		5.56	2.38	0.4	3				
<b>090208</b>		★		5.56	2.38	0.8	3				
<b>110302</b>		★		6.35	3.18	0.2	3.5				
<b>110304</b>		★		6.35	3.18	0.4	3.5				
<b>110308</b>		★		6.35	3.18	0.8	3.5				
<b>160304</b>		★		9.525	3.18	0.4	4.8				
<b>160308</b>	★		9.525	3.18	0.8	4.8					

PCD

PCD TURNING INSERTS

POSI 11°

WITH HOLE

C

D

R

S

T

V

W

GRADES  
B013

IDENTIFICATION  
B002

# PCD TURNING INSERTS [POSITIVE]

## 35° VB TYPE INSERTS WITH HOLE

PCD  
TURNING INSERTS  
POSITIVE  
5°/7°  
15°  
WITH HOLE

C

D


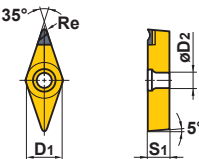
R

S


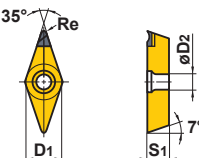
T

V


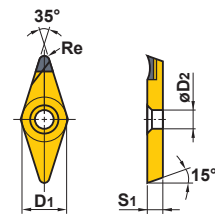
W

Work Material	N	Non-ferrous Metal	●	Cutting Conditions (Guide) :				Geometry	Applicable Holder Page
				● : Stable Cutting	● : General Cutting	✦ : Unstable Cutting			
Shape	Order Number	PCD	Dimensions (mm)						
		MD220	D1	S1	Re	D2			
	NP-VBGT1103V5R-F	★	6.35	3.18	0.05	2.85		E012 E013	
	110301R-F	★	6.35	3.18	0.1	2.85			
	110302R-F	★	6.35	3.18	0.2	2.85			
	110304R-F	★	6.35	3.18	0.4	2.85			
(With Breaker)									

## 35° VC TYPE INSERTS WITH HOLE


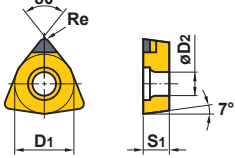
Work Material	N	Non-ferrous Metal	●	Cutting Conditions (Guide) :				Geometry	Applicable Holder Page
				● : Stable Cutting	● : General Cutting	✦ : Unstable Cutting			
Shape	Order Number	PCD	Dimensions (mm)						
		MD220	D1	S1	Re	D2			
	NP-VCGT0802V5R-F	★	4.76	2.38	0.05	2.4		C030 E033 E034	
	080201R-F	★	4.76	2.38	0.1	2.4			
	080202R-F	★	4.76	2.38	0.2	2.4			
	080204R-F	★	4.76	2.38	0.4	2.4			
	1103V5R-F	★	6.35	3.18	0.05	2.8			
	110301R-F	★	6.35	3.18	0.1	2.8			
	110302R-F	★	6.35	3.18	0.2	2.8			
(With Breaker)	110304R-F	★	6.35	3.18	0.4	2.8			

## 35° VD TYPE INSERTS WITH HOLE


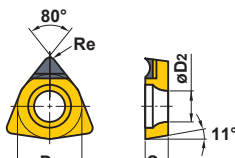
Work Material	N	Non-ferrous Metal	●	Cutting Conditions (Guide) :				Geometry	Applicable Holder Page
				● : Stable Cutting	● : General Cutting	✦ : Unstable Cutting			
Shape	Order Number	PCD	Dimensions (mm)						
		MD220	D1	S1	Re	D2			
	VDGX160302R-F	●	9.525	3.18	0.2	4.5		C036	
	160302L-F	●	9.525	3.18	0.2	4.5			
	160304R-F	●	9.525	3.18	0.4	4.5			
	160304L-F	●	9.525	3.18	0.4	4.5			
(With Breaker)							Right hand insert shown.		

● : Inventory maintained. ★ : Inventory maintained in Japan.

# 80° WC TYPE INSERTS WITH HOLE

Work Material	N	Non-ferrous Metal	●	Cutting Conditions (Guide) :				Geometry	Applicable Holder Page
				● : Stable Cutting	● : General Cutting	✦ : Unstable Cutting			
Shape	Order Number	PCD	Dimensions (mm)				Geometry	Applicable Holder Page	
		MD220	D1	S1	Re	D2			
	<b>WCMWL30202</b>	★	4.76	2.38	0.2	2.3		E028	
	<b>L30204</b>	●	4.76	2.38	0.4	2.3			
	<b>06T304</b>	★	9.525	3.97	0.4	4.4			

# 80° WP TYPE INSERTS WITH HOLE

Work Material	N	Non-ferrous Metal	●	Cutting Conditions (Guide) :				Geometry	Applicable Holder Page
				● : Stable Cutting	● : General Cutting	✦ : Unstable Cutting			
Shape	Order Number	PCD	Dimensions (mm)				Geometry	Applicable Holder Page	
		MD220	D1	S1	Re	D2			
 (With Breaker)	<b>WPGT 040202</b>	★	6.35	2.38	0.2	2.8		-	
	<b>040204</b>	★	6.35	2.38	0.4	2.8			
	<b>060302</b>	★	9.525	3.18	0.2	4.4			
	<b>060304</b>	★	9.525	3.18	0.4	4.4			

PCD  
TURNING INSERTS

PCD  
TURNING INSERTS

POSI  
7°  
11°

WITH HOLE

C

D

R

S

T

V

W

# PCD TURNING INSERTS [POSITIVE]

## 90° SP TYPE INSERTS WITHOUT HOLE

PCD  
TURNING INSERTS

POSI  
11°

WITHOUT  
HOLE

C

D

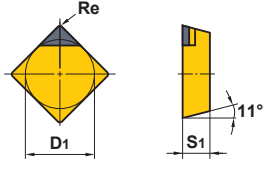

R

**S**

T

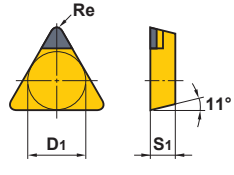

V

W

Work Material	N	Non-ferrous Metal	●	Cutting Conditions (Guide) :			Geometry	Applicable Holder Page
				● : Stable Cutting	● : General Cutting	✦ : Unstable Cutting		
Shape	Order Number	PCD	Dimensions (mm)				-	
		MD220	D1	S1	Re			
	<b>SPGN090302</b>	★	9.525	3.18	0.2			
	<b>090304</b>	★	9.525	3.18	0.4			
	<b>090308</b>	★	9.525	3.18	0.8			
	<b>120304</b>	★	12.7	3.18	0.4			
	<b>120308</b>	★	12.7	3.18	0.8			
	<b>120312</b>	★	12.7	3.18	1.2			

★ : Inventory maintained in Japan.

# 60° TP TYPE INSERTS WITHOUT HOLE

Work Material	N	Non-ferrous Metal	●	Cutting Conditions (Guide) :			Geometry	Applicable Holder Page
				● : Stable Cutting ● : General Cutting ✖ : Unstable Cutting				
Shape	Order Number	PCD	Dimensions (mm)				E027	
		MD220	D1	S1	Re			
	<b>TPGN110302</b>	★	6.35	3.18	0.2			
	<b>110304</b>	★	6.35	3.18	0.4			
	<b>110308</b>	★	6.35	3.18	0.8			
	<b>160302</b>	★	9.525	3.18	0.2			
	<b>160304</b>	★	9.525	3.18	0.4			
	<b>160308</b>	★	9.525	3.18	0.8			

PCD

PCD TURNING INSERTS

POSI 11°

WITHOUT HOLE

C

D

R

S

T

V

W

GRADES  
B013

IDENTIFICATION  
B002

B053