

Coated CBN Grade for Hardened Steel

# MBCO20

Expanded  
Inserts

Exceptional wear and fracture resistance

## Superior grade for machining hardened materials

- Using **MIRACLE**® coating technology.
- A wide variety of honing types suitable for continuous to light interrupted cutting.
- Single sided, multi-corner types included.
- New breaker insert series for superior chip control now available.
- **Corner R0.2 inserts now added to NP-TNGA and NP-VNGA types.**  
The series now available for use in a wider range of machining applications.



# Coated CBN Grade for Hardened Steel

# MBC020

## Features

MBC020 is a general purpose coated CBN grade suitable for continuous turning to light interrupted machining of hardened steel. The combination of high cutting edge rigidity and a coating for higher wear resistance allows MBC020 to cover a wider range of machining applications than conventional CBN grades.

### Coating for Higher Wear Resistance

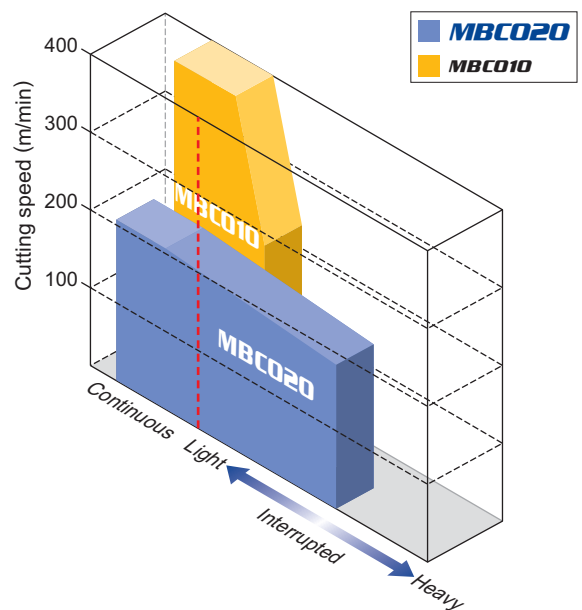
A special new coating, originating from MIRACLE technology, is used for MBC020. This coating technology gives superb wear resistance for machining hardened steels.

### Tougher Cutting Edge

MBC020 utilises a “Particle-activated Sintering Method” during the manufacturing process. As a result, the cutting edge toughness has been increased and also provides superior wear resistance.

### Application Range

**MBC020** further expands the application range of high efficiency machining.



### Recommended Cutting Conditions

Work Material	Cutting Mode	Cutting Speed (m/min)			Feed (mm/rev)	Depth of Cut (mm)	Coolant
		100	200	300			
Hardened Steel (Tempered steel)	Continuous cutting	[Bar chart showing range from ~100 to ~250 m/min]			-0.5	-0.5	Wet, Dry
	Interrupted cutting	[Bar chart showing range from ~100 to ~150 m/min]			-0.2	-0.3	

### Why is a high hardness CBN grade coated using MIRACLE coating technology?

MBC020 is a new coated type CBN to compliment the existing MBC010 grade. By applying a coating to the substrate, MBC020 can obtain a higher wear resistance.

Why does a coating on a high hardness CBN grade increase wear resistance?

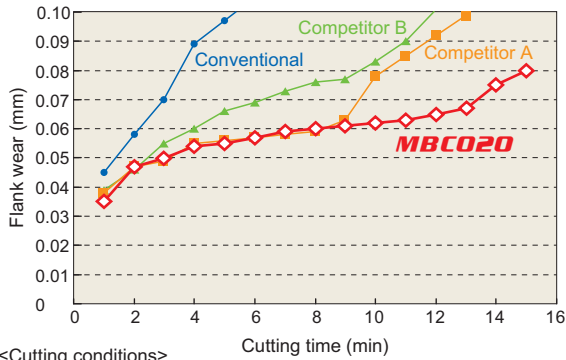
CBN has a hardness value second only to diamond. Taking advantage of this feature, CBN tools are able to withstand high temperatures when machining hardened steels.

However, for MBC020, MIRACLE coating technology has been used and covers the CBN with a highly heat-resistant ceramic coating layer that maximises the hardness properties. As a result, MBC020 displays a higher wear resistance than uncoated CBN inserts of the same grade.

**MBC020 elevating speed and efficiency to a higher level**

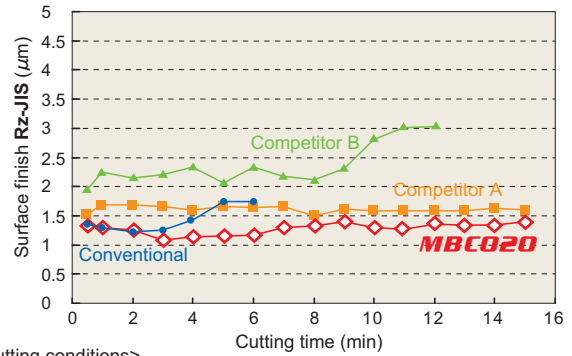
# Cutting Performance

## Wear resistance



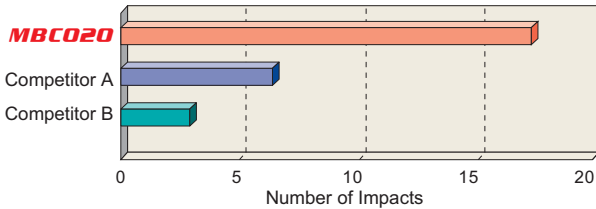
<Cutting conditions>  
 Workpiece : JIS SCr420(60HRC) Feed : 0.1mm/rev  
 Insert : NP-CNGA120408GA4 Depth of cut: 0.1mm  
 Cutting speed: 220m/min Continuous cutting (Dry)

## Surface finish

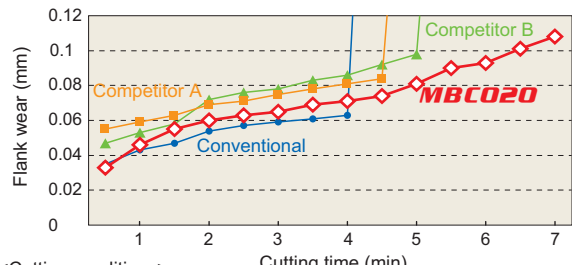
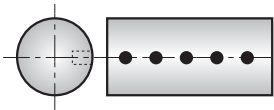


<Cutting conditions>  
 Workpiece : JIS SCr420(60HRC) Feed : 0.1mm/rev  
 Insert : NP-CNGA120408GA4 Depth of cut: 0.1mm  
 Cutting speed: 220m/min Continuous cutting (Dry)

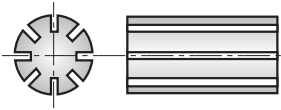
## Toughness



<Cutting conditions>  
 Workpiece : JIS SCr420(60HRC)  
 With hole  
 Insert : NP-CNGA120408GA4  
 Cutting speed: 120m/min  
 Feed : 0.15mm/rev  
 Depth of cut : 0.15mm  
 Interrupted cutting (Dry)

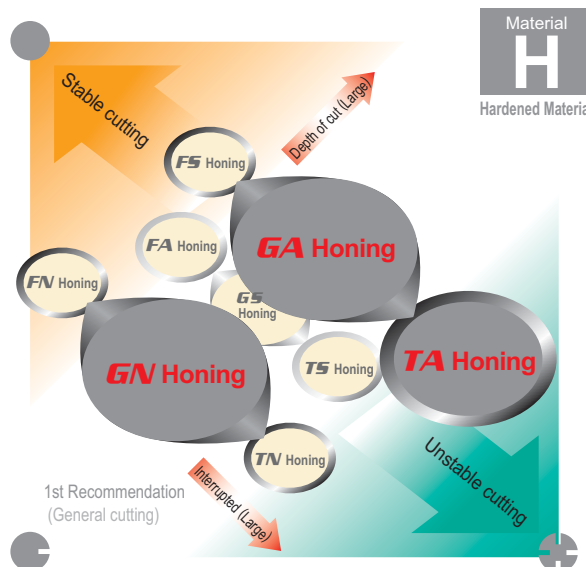


<Cutting conditions>  
 Workpiece : JIS SCM415(60HRC)  
 8 Grooves  
 Insert : NP-CNGA120408GA4  
 Cutting speed: 200m/min  
 Feed : 0.1mm/rev  
 Depth of cut : 0.1mm  
 Interrupted cutting (Dry)



# A Wide Variety of Edge Preparation Forms (Honing types)

Cutting performance of CBN tools greatly depends on the type of edge preparation (honing). To make tools available with the optimum edge honing, Mitsubishi's CBN insert series offers an additional 6 types of edge honing based on the 3 conventional honing types, namely F (for continuous cutting), G (for general purpose) and T (for interrupted cutting). For MBC020, to maximize the benefits of its grade properties, three honing types, GA (for general purpose), GN (for general purpose & for less crater wear) and TA (for interrupted cutting) are offered as standard.



Please select GA honing if the major application is continuous to light interrupted cutting, and select TA honing if the major application is interrupted cutting.



# MBC020

## Features of Breaker Inserts

### Chip Breaker Geometry Designed for Excellent Chip Control

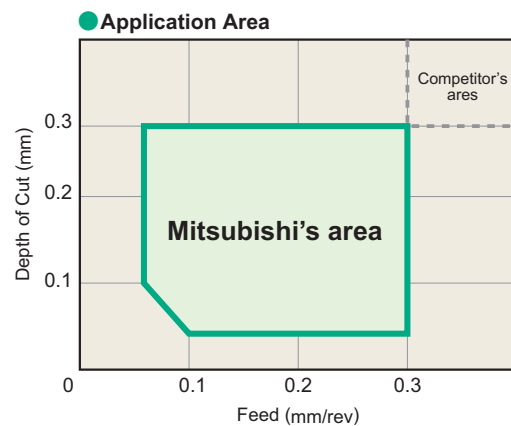
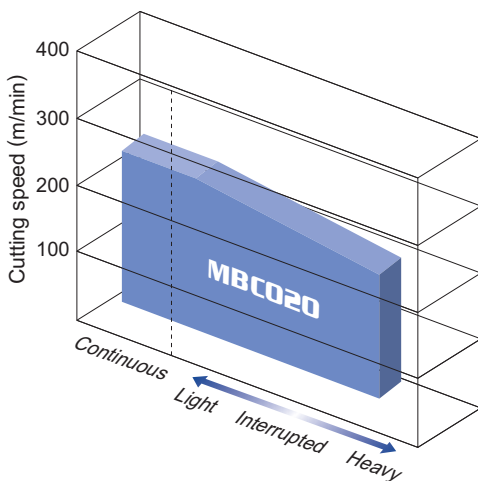
R-shaped chip breaker ensures optimization of the cutting point and the chip breaker position. Enables effective chip discharge even when copying and prevents the chips from wrapping around the holder under the cutting conditions for finishing.

### Long Life Coated CBN Grade

The coated grade MBC020 made with MIRACLE coating technology exhibits high cutting performance over a wider range of machining applications from continuous to medium interrupted cutting and enables long tool life.

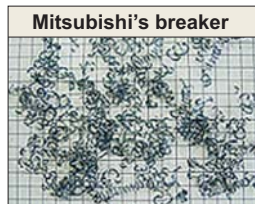
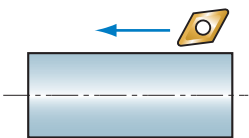


### Application Range



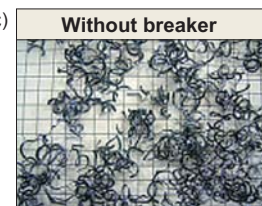
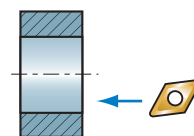
## Cutting Performance of Breaker Inserts

### External cutting



<Cutting Conditions>  
 Workpiece : JIS SCr420H(55HRC)  
 Insert : BF-CNGG120408TA4  
 Cutting Speed: 100m/min  
 Feed : 0.2mm/rev  
 Depth of Cut : 0.1mm  
 Dry

### Internal cutting

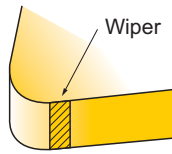


<Cutting Conditions>  
 Workpiece : JIS SCM420H(60HRC)  
 Insert : BF-CCGT09T308TA2  
 Cutting Speed: 120m/min  
 Feed : 0.2mm/rev  
 Depth of Cut : 0.3mm  
 Dry

## Wiper Insert

### What is a wiper insert?

- The wiper insert is designed with a wiper edge that is situated where the straight edge meets the corner radius.
- In comparison to conventional breakers, the surface finish does not deteriorate even if the feed rate is doubled.
- Machining at high feed rates improves cutting efficiency.



### 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 changing 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

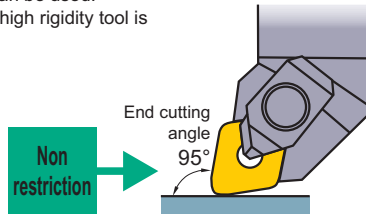
Under high feed conditions, the chips generated become thicker and are more easily broken, thus, chip control is improved.

## Operational Guidance

### When using NP-CNGA / NP-CCGW types

#### No restriction for holders

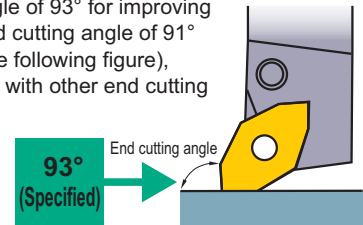
Standard holders can be used.  
(\*A double clamp, high rigidity tool is recommended.)



### When using NP-DNGA type

#### Restriction for holders

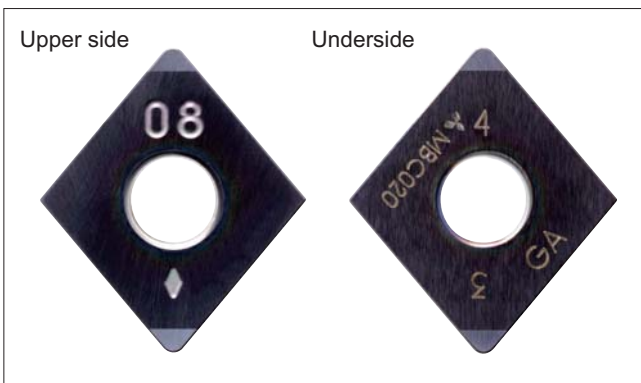
Use a holder with an end cutting angle of 93° for improving wiper efficiency. A holder with an end cutting angle of 91° can improve wiper efficiency (see the following figure), however, there is no wiper efficiency with other end cutting angles (60°, 90°, 107° etc.).



## Multi-corner Type Inserts

- Single sided negative inserts are now included.
- The same honing types are available for both single and double sided multi-corner inserts.

### Double sided, multi-corner type insert



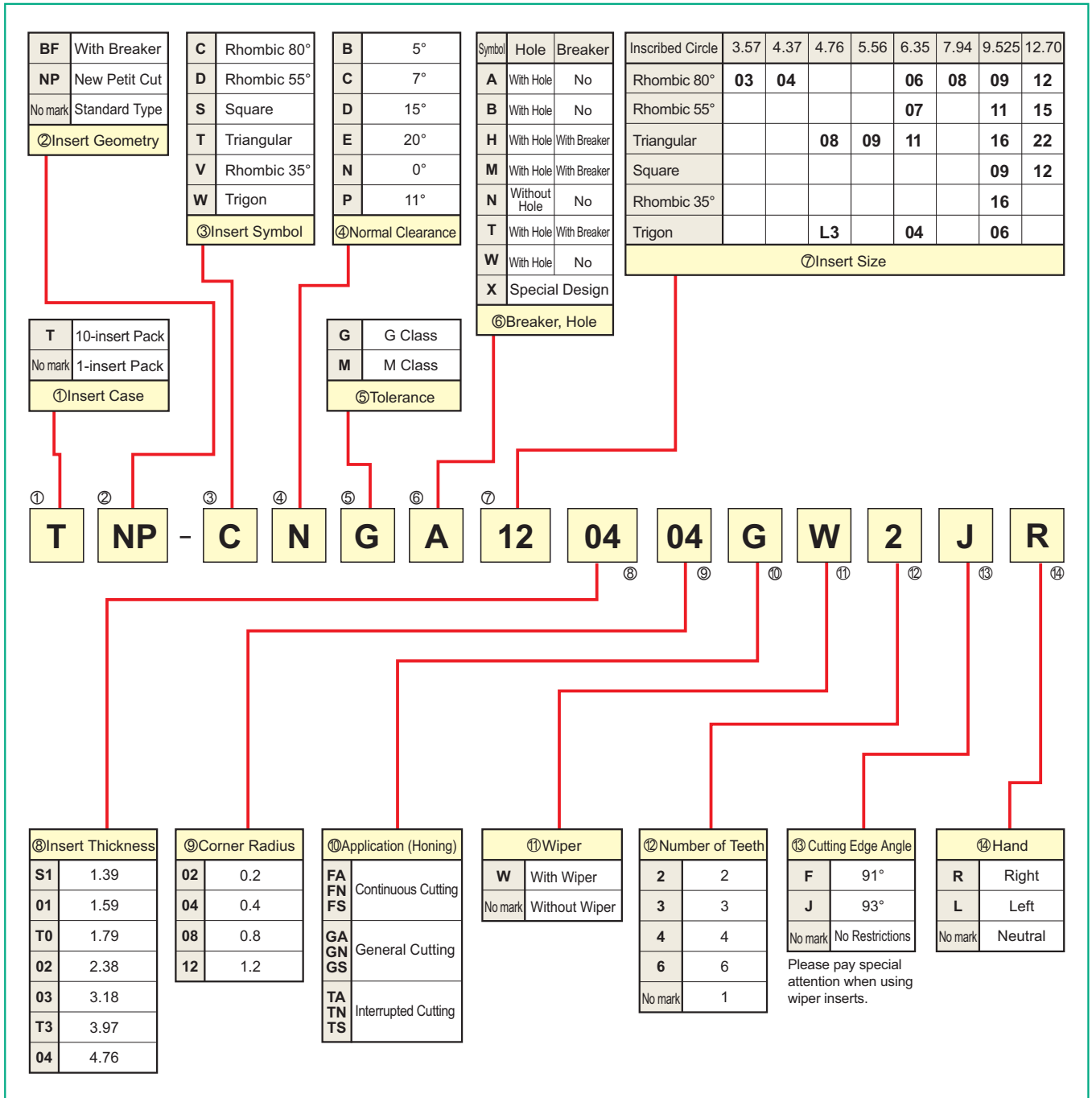
### Single sided, multi-corner type insert

- A single sided, multi-corner type insert has no cutting edges on the underside. The type of grade is stamped on the upper side.

## Small Corner Radius Inserts

- Corner R0.2 inserts now added to NP-TNGA and NP-VNGA types. Making it suitable for the machining of small work corner radii.


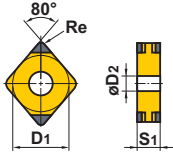

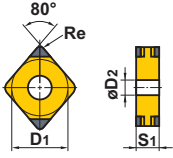

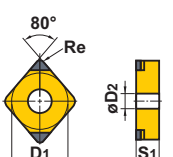

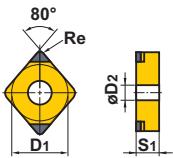

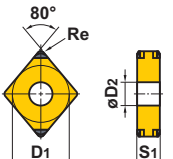

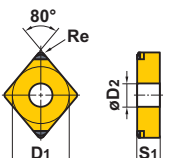
## IDENTIFICATION(CBN AND PCD)



Note) There are exceptions to the identifications mentioned above.

## Inserts


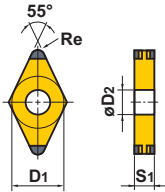

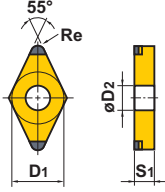

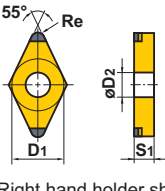

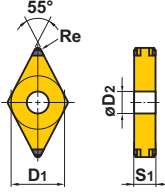

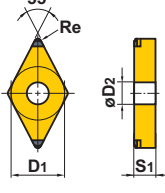

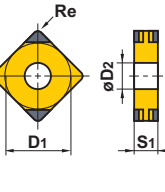
### ● Negative Inserts

Shape	Order Number	Stock	Dimensions (mm)				Geometry	Holders
			D1	S1	Re	D2		
 Multi-corner Type Double Sided	<b>NP-CNGA120404GA4</b>	●	12.7	4.76	0.4	5.16		LL holder Double clamp holder Double clamp dimple bar P type boring bar D type boring head LL cartridge
	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		
	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		
 Multi-corner Type Double Sided *1	<b>NP-CNGA120404GAW4</b>	●	12.7	4.76	0.4	5.16		LL holder Double clamp holder Double clamp dimple bar P type boring bar D type boring head LL cartridge
	120408GAW4	●	12.7	4.76	0.8	5.16		
	120412GAW4	●	12.7	4.76	1.2	5.16		
 Multi-corner Type Single Sided	<b>NP-CNGA120404GA2</b>	●	12.7	4.76	0.4	5.16		LL holder Double clamp holder Double clamp dimple bar P type boring bar D type boring head LL cartridge
	120408GA2	●	12.7	4.76	0.8	5.16		
	120412GA2	●	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		
	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			
 Multi-corner Type Single Sided NEW PETIT CUT (Wiper)	<b>NP-CNGA120404GAW2</b>	●	12.7	4.76	0.4	5.16		LL holder Double clamp holder Double clamp dimple bar P type boring bar D type boring head LL cartridge
	120408GAW2	●	12.7	4.76	0.8	5.16		
	120412GAW2	●	12.7	4.76	1.2	5.16		
 Multi-corner Type Double Sided NEW PETIT CUT (With Breaker)	<b>BF-CNGG120404TA4</b>	●	12.7	4.76	0.4	5.16		LL holder Double clamp holder Double clamp dimple bar P type boring bar D type boring head LL cartridge
	120408TA4	●	12.7	4.76	0.8	5.16		
	120412TA4	●	12.7	4.76	1.2	5.16		
 Multi-corner Type Single Sided NEW PETIT CUT (With Breaker)	<b>BF-CNGM120404TA2</b>	●	12.7	4.76	0.4	5.16		LL holder Double clamp holder Double clamp dimple bar P type boring bar D type boring head LL cartridge
	120408TA2	●	12.7	4.76	0.8	5.16		
	120412TA2	●	12.7	4.76	1.2	5.16		

\*1 Please refer to page 4 before using wiper inserts.


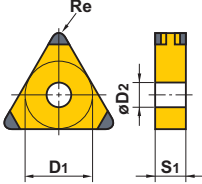

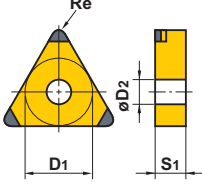

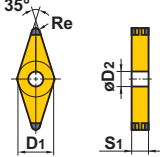

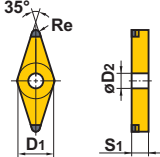

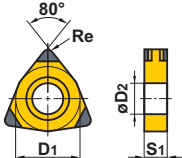

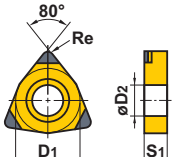
## Inserts

### ● Negative Inserts

Shape	Order Number	Stock	Dimensions (mm)				Geometry	Holders
			D1	S1	Re	D2		
 Multi-corner Type Double Sided	<b>NP-DNGA150404GA4</b>	●	12.7	4.76	0.4	5.16		LL holder Double clamp holder Double clamp dimple bar P type boring bar D type boring head
	<b>150408GA4</b>	●	12.7	4.76	0.8	5.16		
	<b>150412GA4</b>	●	12.7	4.76	1.2	5.16		
	<b>150404GN4</b>	●	12.7	4.76	0.4	5.16		
	<b>150408GN4</b>	●	12.7	4.76	0.8	5.16		
	<b>150412GN4</b>	●	12.7	4.76	1.2	5.16		
	<b>150404TA4</b>	●	12.7	4.76	0.4	5.16		
	<b>150408TA4</b>	●	12.7	4.76	0.8	5.16		
 Multi-corner Type Single Sided	<b>NP-DNGA150404GA2</b>	●	12.7	4.76	0.4	5.16		LL holder Double clamp holder Double clamp dimple bar P type boring bar D type boring head
	<b>150408GA2</b>	●	12.7	4.76	0.8	5.16		
	<b>150412GA2</b>	●	12.7	4.76	1.2	5.16		
	<b>150404GN2</b>	●	12.7	4.76	0.4	5.16		
	<b>150408GN2</b>	●	12.7	4.76	0.8	5.16		
	<b>150412GN2</b>	●	12.7	4.76	1.2	5.16		
	<b>150404TA2</b>	●	12.7	4.76	0.4	5.16		
	<b>150408TA2</b>	●	12.7	4.76	0.8	5.16		
 Multi-corner Type Single Sided NEW PETIT CUT (Wiper) *1	<b>NP-DNGA150404GAW2JR</b>	●	12.7	4.76	0.4	5.16	 Right hand holder shown.	LL holder Double clamp holder Double clamp dimple bar P type boring bar D type boring head
	<b>150404GAW2JL</b>	●	12.7	4.76	0.4	5.16		
	<b>150408GAW2JR</b>	●	12.7	4.76	0.8	5.16		
	<b>150408GAW2JL</b>	●	12.7	4.76	0.8	5.16		
 Multi-corner Type Double Sided NEW PETIT CUT (With Breaker)	<b>BF-DNGG150404TA4</b>	●	12.7	4.76	0.4	5.16		LL holder Double clamp holder Double clamp dimple bar P type boring bar D type boring head
	<b>150408TA4</b>	●	12.7	4.76	0.8	5.16		
	<b>150412TA4</b>	●	12.7	4.76	1.2	5.16		
 Multi-corner Type Single Sided NEW PETIT CUT (With Breaker)	<b>BF-DNGM150404TA2</b>	●	12.7	4.76	0.4	5.16		LL holder Double clamp holder Double clamp dimple bar P type boring bar D type boring head
	<b>150408TA2</b>	●	12.7	4.76	0.8	5.16		
	<b>150412TA2</b>	●	12.7	4.76	1.2	5.16		
 Multi-corner Type Double Sided NEW PETIT CUT	<b>NP-SNGA120404GA4</b>	●	12.7	4.76	0.4	5.16		LL holder Double clamp holder ML holder Double clamp dimple bar P type boring bar LL cartridge
	<b>120408GA4</b>	●	12.7	4.76	0.8	5.16		
	<b>120412GA4</b>	●	12.7	4.76	1.2	5.16		

\*1 Please refer to page 4 before using wiper inserts.


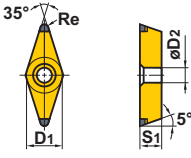

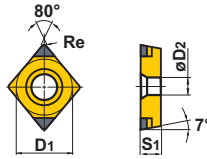

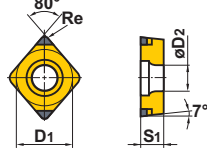

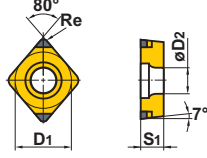

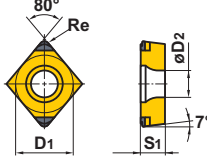
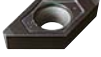
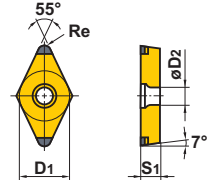


Shape	Order Number	Stock	Dimensions (mm)				Geometry	Holders
			D1	S1	Re	D2		
 Multi-corner Type Double Sided	<b>NP-TNGA160404GA6</b>	●	9.525	4.76	0.4	3.81		LL holder Double clamp holder ML holder WP holder Double clamp dimple bar P type boring bar D type boring head LL cartridge
	<b>160408GA6</b>	●	9.525	4.76	0.8	3.81		
	<b>160412GA6</b>	●	9.525	4.76	1.2	3.81		
	<b>160404GN6</b>	●	9.525	4.76	0.4	3.81		
	<b>160408GN6</b>	●	9.525	4.76	0.8	3.81		
	<b>160412GN6</b>	●	9.525	4.76	1.2	3.81		
	<b>160404TA6</b>	●	9.525	4.76	0.4	3.81		
	<b>160408TA6</b>	●	9.525	4.76	0.8	3.81		
	<b>160412TA6</b>	●	9.525	4.76	1.2	3.81		
 Multi-corner Type Single Sided	<b>NEW NP-TNGA160402GA3</b>	●	9.525	4.76	0.2	3.81		LL holder Double clamp holder ML holder WP holder Double clamp dimple bar P type boring bar D type boring head LL cartridge
	<b>160404GA3</b>	●	9.525	4.76	0.4	3.81		
	<b>160408GA3</b>	●	9.525	4.76	0.8	3.81		
	<b>160412GA3</b>	●	9.525	4.76	1.2	3.81		
	<b>NEW 160402GN3</b>	●	9.525	4.76	0.2	3.81		
	<b>160404GN3</b>	●	9.525	4.76	0.4	3.81		
	<b>160408GN3</b>	●	9.525	4.76	0.8	3.81		
	<b>160412GN3</b>	●	9.525	4.76	1.2	3.81		
	<b>160404TA3</b>	●	9.525	4.76	0.4	3.81		
<b>160408TA3</b>	●	9.525	4.76	0.8	3.81			
<b>160412TA3</b>	●	9.525	4.76	1.2	3.81			
 Multi-corner Type Double Sided	<b>NP-VNGA160404GA4</b>	●	9.525	4.76	0.4	3.81		Double clamp holder MP holder Double clamp dimple bar D type boring head
	<b>160408GA4</b>	●	9.525	4.76	0.8	3.81		
 Multi-corner Type Single Sided	<b>NEW NP-VNGA160402GA2</b>	●	9.525	4.76	0.2	3.81		Double clamp holder MP holder Double clamp dimple bar D type boring head
	<b>160404GA2</b>	●	9.525	4.76	0.4	3.81		
	<b>160408GA2</b>	●	9.525	4.76	0.8	3.81		
	<b>NEW 160402GN2</b>	●	9.525	4.76	0.2	3.81		
 Multi-corner Type Double Sided	<b>NP-WNGA080408GA6</b>	●	12.7	4.76	0.8	5.16		LL holder Double clamp holder MP holder Double clamp dimple bar D type boring head
 Multi-corner Type Single Sided	<b>NP-WNGA080408GA3</b>	●	12.7	4.76	0.8	5.16		LL holder Double clamp holder MP holder Double clamp dimple bar D type boring head

# MBCO20

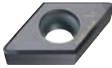
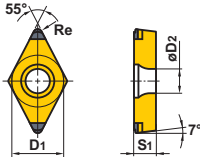

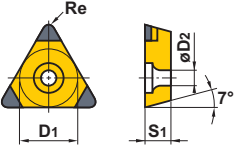

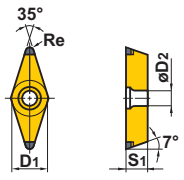

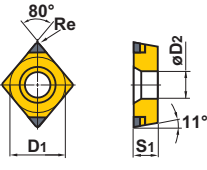

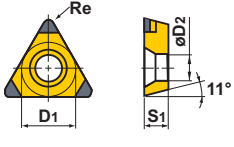

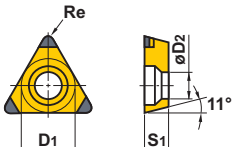
## Inserts

### ● Positive inserts

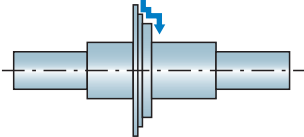
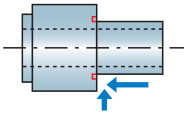
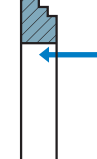
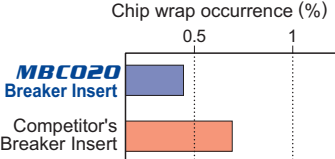
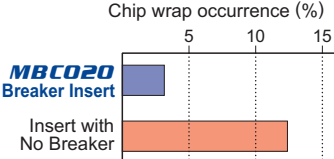
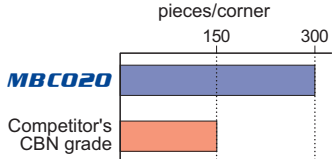
Shape	Order Number	Stock	Dimensions (mm)				Geometry	Holders
			D1	S1	Re	D2		
 Multi-corner Type Single Sided	NEW PETIT CUT <b>NP-VBGW160404GA2</b>	●	9.525	4.76	0.4	4.43		Dimple bar
	<b>160408GA2</b>	●	9.525	4.76	0.8	4.43		
 Multi-corner Type Single Sided	NEW PETIT CUT <b>NP-CCGB060204GA2</b>	●	6.35	2.38	0.4	2.8		Dimple bar
 Multi-corner Type Single Sided	NEW PETIT CUT <b>NP-CCGW060202GA2</b>	●	6.35	2.38	0.2	2.8		SP holder Small tools S type boring bar
	<b>060204GA2</b>	●	6.35	2.38	0.4	2.8		
	<b>060208GA2</b>	●	6.35	2.38	0.8	2.8		
	<b>09T302GA2</b>	●	9.525	3.97	0.2	4.4		
	<b>09T304GA2</b>	●	9.525	3.97	0.4	4.4		
	<b>09T308GA2</b>	●	9.525	3.97	0.8	4.4		
	<b>09T302GN2</b>	●	9.525	3.97	0.2	4.4		
	<b>09T304GN2</b>	●	9.525	3.97	0.4	4.4		
<b>09T308GN2</b>	●	9.525	3.97	0.8	4.4			
NEW PETIT CUT (Wiper) *1   Multi-corner Type Single Sided	<b>NP-CCGW09T308GAW2</b>	●	9.525	3.97	0.8	4.4		SP holder Small tools S type boring bar
NEW PETIT CUT (With Breaker)   Multi-corner Type Single Sided	<b>BF-CCGT09T304TA2</b>	●	9.525	3.97	0.4	4.4		SP holder Small tools S type boring bar
	<b>09T308TA2</b>	●	9.525	3.97	0.8	4.4		
 Multi-corner Type Single Sided	NEW PETIT CUT <b>NP-DCGW070202GA2</b>	●	6.35	2.38	0.2	2.8		SP holder Small tools Dimple bar S type boring bar
	<b>070204GA2</b>	●	6.35	2.38	0.4	2.8		
	<b>070208GA2</b>	●	6.35	2.38	0.8	2.8		
	<b>11T302GA2</b>	●	9.525	3.97	0.2	4.4		
	<b>11T304GA2</b>	●	9.525	3.97	0.4	4.4		
	<b>11T308GA2</b>	●	9.525	3.97	0.8	4.4		
	<b>070202GN2</b>	●	6.35	2.38	0.2	2.8		
	<b>070204GN2</b>	●	6.35	2.38	0.4	2.8		
	<b>070208GN2</b>	●	6.35	2.38	0.8	2.8		
	<b>11T302GN2</b>	●	9.525	3.97	0.2	4.4		
<b>11T304GN2</b>	●	9.525	3.97	0.4	4.4			
<b>11T308GN2</b>	●	9.525	3.97	0.8	4.4			

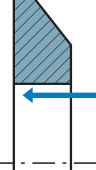
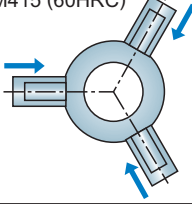
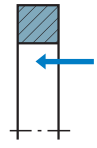
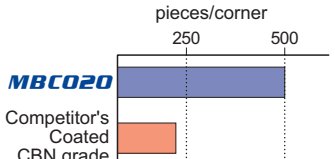
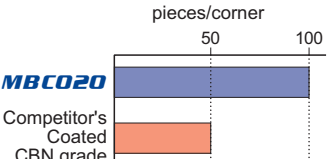
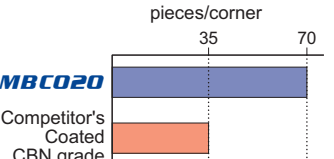
\*1 Please refer to page 4 before using wiper inserts.

● : Inventory maintained. □ : Non stock, produced to order only.

Shape	Order Number	Stock	Dimensions (mm)				Geometry	Holders
			D1	S1	Re	D2		
NEW PETIT CUT (With Breaker)    Multi-corner Type Single Sided	<b>BF-DCGT11T304TA2</b>	●	9.525	3.97	0.4	4.4		SP holder Small tools Dimple bar S type boring bar
	<b>11T308TA2</b>	●	9.525	3.97	0.8	4.4		
NEW PETIT CUT    Multi-corner Type Single Sided	<b>NP-TCGW090202GA3</b>	●	5.56	2.38	0.2	2.5		SP holder S type boring bar
	<b>090204GA3</b>	●	5.56	2.38	0.4	2.5		
	<b>090208GA3</b>	●	5.56	2.38	0.8	2.5		
	<b>110202GA3</b>	●	6.35	2.38	0.2	2.8		
	<b>110204GA3</b>	●	6.35	2.38	0.4	2.8		
	<b>110208GA3</b>	●	6.35	2.38	0.8	2.8		
	<b>130304GA3</b>	●	7.94	3.18	0.4	3.4		
	<b>130308GA3</b>	●	7.94	3.18	0.8	3.4		
	<b>16T304GA3</b>	●	9.525	3.97	0.4	4.4		
<b>16T308GA3</b>	●	9.525	3.97	0.8	4.4			
NEW PETIT CUT    Multi-corner Type Single Sided	<b>NP-VCGW160404GA2</b>	●	9.525	4.76	0.4	4.4		SP holder S type boring bar
	<b>160408GA2</b>	●	9.525	4.76	0.8	4.4		
NEW PETIT CUT    Multi-corner Type Single Sided	<b>NP-CPGB080204GA2</b>	●	7.94	2.38	0.4	3.5		Dimple bar
	<b>080208GA2</b>	●	7.94	2.38	0.8	3.5		
	<b>090304GA2</b>	●	9.525	3.18	0.4	4.5		
	<b>090308GA2</b>	●	9.525	3.18	0.8	4.5		
NEW PETIT CUT    Multi-corner Type Single Sided	<b>NP-TPGB080204GA3</b>	●	4.76	2.38	0.4	2.4		Dimple bar
	<b>080208GA3</b>	●	4.76	2.38	0.8	2.4		
	<b>090204GA3</b>	●	5.56	2.38	0.4	2.9		
	<b>090208GA3</b>	●	5.56	2.38	0.8	2.9		
	<b>110304GA3</b>	●	6.35	3.18	0.4	3.4		
	<b>110308GA3</b>	●	6.35	3.18	0.8	3.4		
	<b>160304GA3</b>	●	9.525	3.18	0.4	4.4		
<b>160308GA3</b>	●	9.525	3.18	0.8	4.4			
NEW PETIT CUT    Multi-corner Type Single Sided	<b>NP-TPGX080202GA3</b>	□	4.76	2.38	0.2	2.5		F type boring bar
	<b>080204GA3</b>	□	4.76	2.38	0.4	2.5		
	<b>080208GA3</b>	□	4.76	2.38	0.8	2.5		
	<b>090204GA3</b>	□	5.56	2.38	0.4	3.0		
	<b>090208GA3</b>	□	5.56	2.38	0.8	3.0		
	<b>110304GA3</b>	□	6.35	3.18	0.4	3.5		
<b>110308GA3</b>	□	6.35	3.18	0.8	3.5			

## Application Examples

Insert	BF-CNGM120404TA2	BF-DCGT11T304TA2	NP-CNGA120408GA4
Workpiece	Alloy Steel (60HRC) 	Alloy Steel (60HRC) 	JIS SUJ2 (60HRC) 
Component	Shaft	Gear parts	Gear parts
Cutting Conditions	Cutting Speed (m/min)	120	130
	Feed (mm/rev)	0.08	0.2
	Depth of Cut (mm)	0.1-0.15	0.15
Coolant	Wet cutting	Wet cutting	Dry cutting
Results	<p>Chip wrap occurrence (%)</p>  <p>Lower chip wrap occurrence and longer insert life when machining 400 pieces per corner.</p>	<p>Chip wrap occurrence (%)</p>  <p>Lower chip wrap occurrence and longer insert life when machining 240 pieces per corner.</p>	<p>pieces/corner</p>  <p>A competitor's grade reached the end of tool life after machining 150 pieces. MBC020 doubled tool life by machining up to 300 pieces.</p>

Insert	NP-CNGA120412GA4	NP-CNGA120408GAW4	NP-CNGA120408GA4
Workpiece	JIS SCM420 (60HRC) 	JIS SCM415 (60HRC) 	JIS SCR420H (60HRC) 
Component	Gear parts	Joint parts	Bearing parts
Cutting Conditions	Cutting Speed (m/min)	120	100
	Feed (mm/rev)	0.08	0.25
	Depth of Cut (mm)	0.15	0.2
Coolant	Wet cutting	Dry cutting	Dry cutting
Results	<p>pieces/corner</p>  <p>MBC020 maintained a good surface finish after machining 500 pieces compared with only 200 pieces from a conventional grade.</p>	<p>pieces/corner</p>  <p>MBC020 doubled the components machined compared to a competitor's grade.</p>	<p>pieces/corner</p>  <p>A competitor's grade reached the end of tool life after machining 35 pieces, MBC020 doubled tool life by machining up to 70 pieces.</p>

### For Your Safety

- Don't handle inserts and chips without gloves. ● Please machine within the recommended application range and exchange expired tools with new ones in advance of breakage. ● Please use safety covers and wear safety glasses. ● When using compounded cutting oils, please take fire precautions. ● When attaching inserts or spare parts, please use only the correct wrench or spanner.

# MITSUBISHI MATERIALS CORPORATION



The Scope of the Registration:  
Design, Development and  
Production of Coated  
Carbide Tools and Carbide  
Blanks



The Scope of the Registration:  
Design, Development and  
Production of Cutting Tools,  
Wear-resistant Tools, Rock  
Drilling Tools, Cemented  
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Products



JAB  
EMC Registration  
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## MITSUBISHI MATERIALS CORPORATION Area Marketing & Operations Dept.

KFC bldg., 8F, 1-6-1, Yokoami, Sumida-ku, Tokyo 130-0015, Japan  
TEL +81-3-5819-8772 FAX +81-3-5819-8774

## MMC HARTMETALL GmbH

Comeniusstr.2, 40670, Meerbusch GERMANY  
TEL +49-2159-9189-0 FAX +49-2159-918966

## MITSUBISHI MATERIALS U.S.A. CORPORATION Headquarters

17401, Eastman Street, Irvine, California, 92614, USA  
TEL +1-949-862-5100 FAX +1-949-862-5180

## MMC METAL SINGAPORE PTE LTD.

10, Arumugam Road, #04-00 Lion Industrial Bldg., 409957, SINGAPORE  
TEL +65-6743-9370 FAX +65-6749-1469

Mitsubishi Carbide Home page : <http://www.mitsubishicarbide.com>  
(Tools specifications subject to change without notice.)