

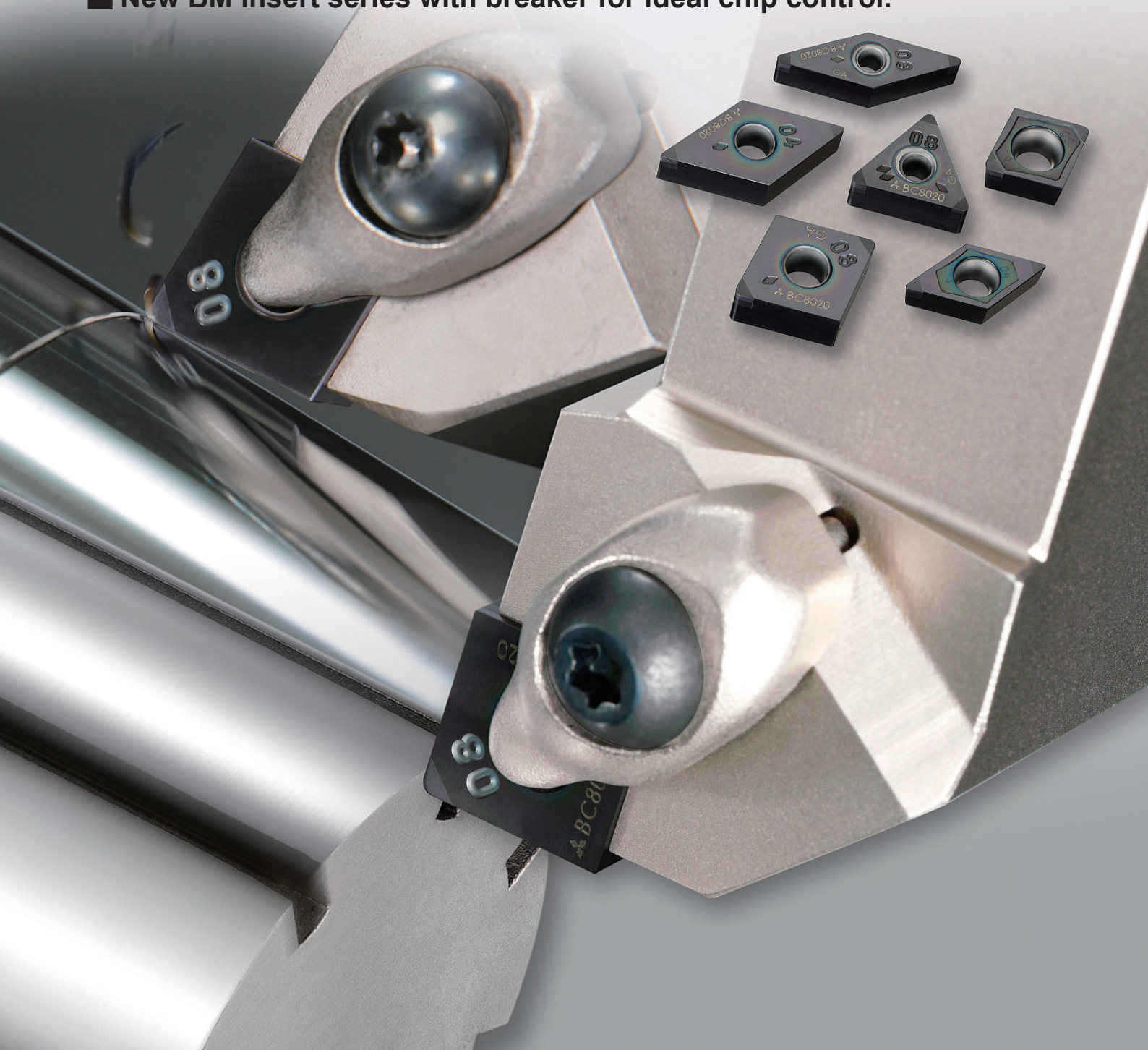
Insert  
Expansions!!

General Purpose Coated CBN Grade for Hardened Steel

# BC8020

## A new CBN tool grade to revolutionise the machining of hardened steels.

- Even under high load conditions, high wear resistance can be obtained to increase machining performance.
- Cutting edge strength offering longer tool life even during unstable or interrupted machining.
- New BM insert series with breaker for ideal chip control.



# BC8020

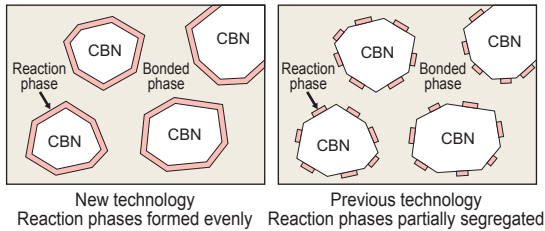
## Features

### Excellent wear resistance

Increased cutting edge strength and high crater wear resistant CBN grade in combination with a highly wear resistant ceramic coating, results in longer tool life and improved machining efficiency.

### Highly reliable cutting edge strength

1. Contains high toughness CBN particles.
2. Uses Mitsubishi's unique "Particle-activated Sintering" Method".



3. Uses a new brazing method.

### Wide application range

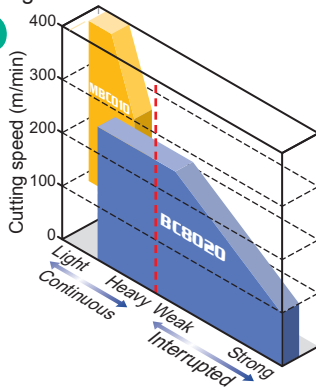
- For machining of hardened steels, it can be used from continuous through to interrupted machining.
- High crater wear resistance makes it possible to carry out large depth of cut machining such as removal of carbonized layers.

- Available with 3 variations of honing.
  - FS (Continuous cutting)
  - GA (General purpose cutting)
  - TA (Interrupted cutting)

#### Honing



#### Application Range



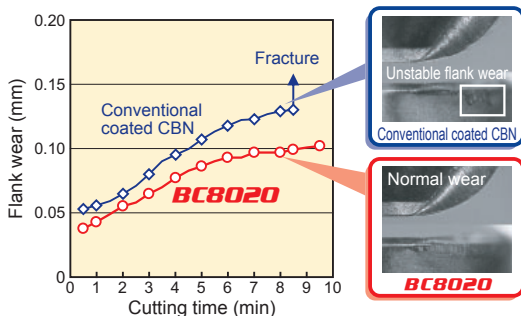
### Recommended Cutting Conditions

Work Material	Cutting Mode	Cutting Speed (m/min)				Feed (mm/rev)	Depth of Cut (mm)	Coolant
		50	100	200	300			
Hardened Steel (Tempered steel)	Continuous cutting	[Bar chart showing speed range]				-0.3	-0.5	Wet, Dry
	Interrupted cutting	[Bar chart showing speed range]				-0.2	-0.3	

## Cutting Performance (1)

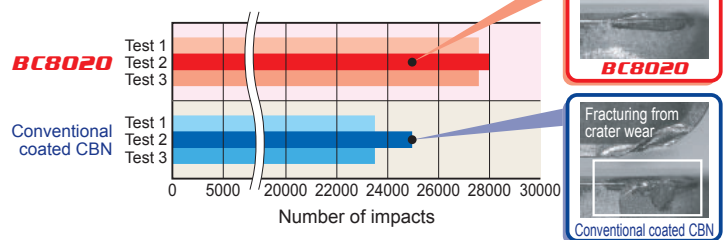
### Wear resistance

- BC8020, offers high wear resistance for high load continuous cutting.



### Toughness

- BC8020 with high wear resistance results in longer tool life for continuous cutting.



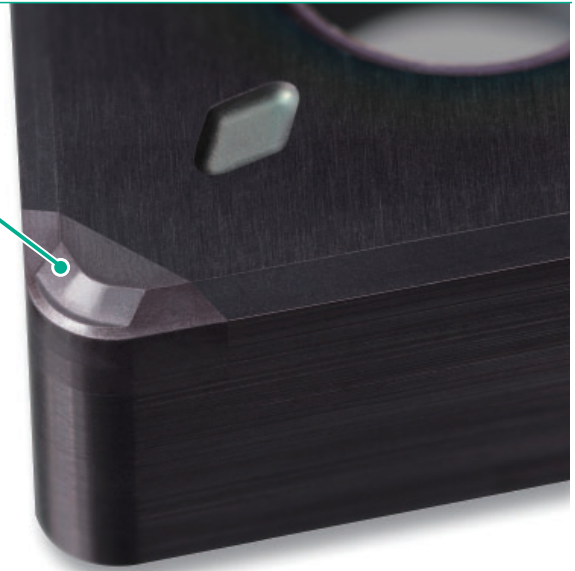
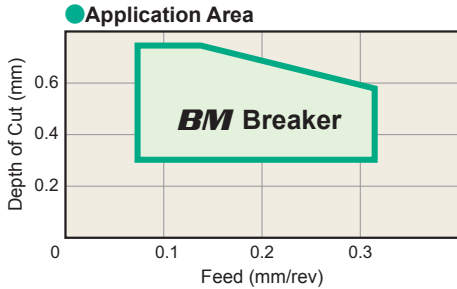
<Cutting conditions>  
 Workpiece : JIS SCr420(60HRC) Feed : 0.15mm/rev  
 Insert : NP-CNGA120408GA Depth of cut : 0.5mm  
 Cutting speed : 180m/min Continuous cutting (Wet)

<Cutting conditions>  
 Workpiece : JIS SCM415 Feed : 0.15mm/rev  
 (60HRC) Depth of cut : 0.15mm  
 Insert : NP-CNGA120408GA Interrupted cutting (Dry)  
 Cutting speed : 150m/min

## Breaker Insert

### Outstanding chip control and long tool life with deep cutting

- The chipbreaker is similar radius to the corner and optimises its position in relation to the cutting point.
- Increasing the metal removal rate with deeper cutting prevents damage to the breaker and improves chip control.



### Recommended Cutting Conditions

Work Material	Cutting Mode	Cutting Speed (m/min)				Feed (mm/rev)	Depth of Cut (mm)	Coolant
		50	100	200	300			
Hardened Steel (Tempered steel)	Continuous cutting	----- ----- ----- -----				-0.3	-0.6	Dry
							-0.8	Wet

## Wiper Insert

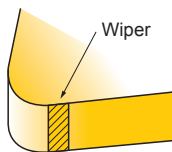
### Effective for machining workpieces with low rigidity

- The new wiper shape not only shortens machining time and maintains surface roughness with a high feed rate, it enables machining of areas where vibration typically prevents other tools from working.

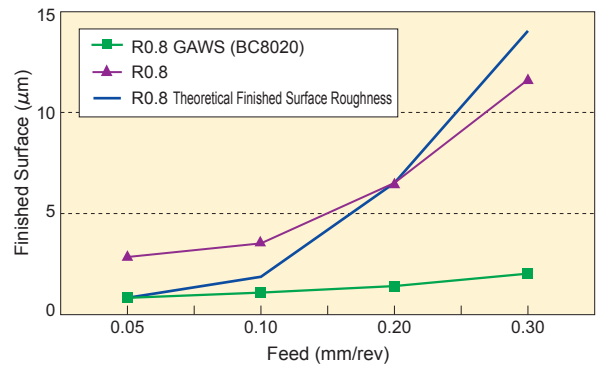
#### Wiper insert for low rigidity workpieces

**NP-CNGA120408GAWS4**

WS : General Cutting



### Surface roughness



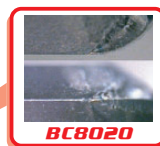
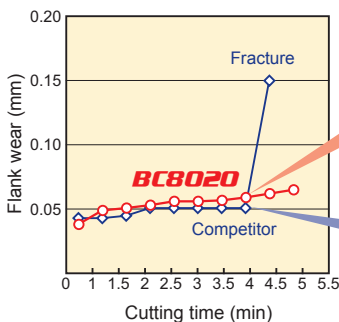
<Cutting conditions>

Workpiece : Hardened Material (HRC60)    Depth of cut : 0.1mm  
 Insert : NP-CNGA120408GAWS4    Dry cutting  
 Cutting speed : 120m/min

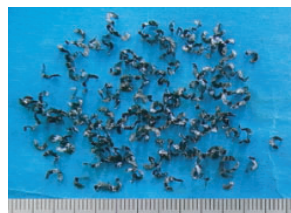
## Cutting Performance (2)

### Wear resistance

- BC8020, offers high wear resistance for high load continuous cutting.



### Chip geometry of BC8020-BM breaker



<Cutting conditions>

Workpiece : JIS SCM415 (60HRC)  
 Insert : BM-CNGM120408TA  
 Cutting speed : 180m/min  
 Feed : 0.2mm/rev  
 Depth of cut : 0.5mm  
 Continuous cutting (Wet)


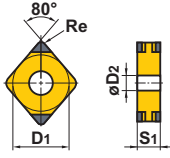

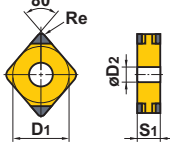

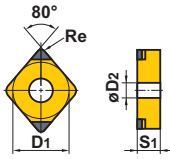

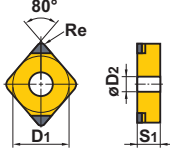

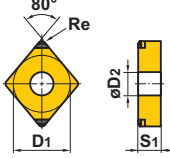

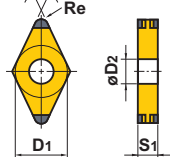


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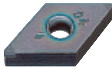
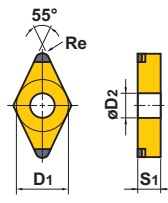
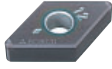
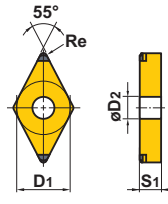

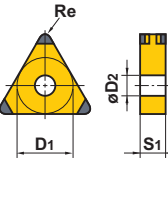

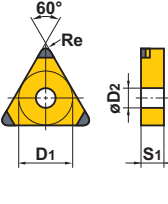

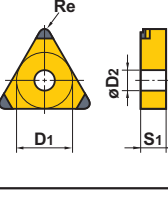
## Inserts

### ● Negative Inserts

Horning : GA :General purpose cutting FS :Continuous cutting TA :Interrupted cutting

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
	<b>120408GA4</b>	●	12.7	4.76	0.8	5.16		Double clamp holder
	<b>120412GA4</b>	●	12.7	4.76	1.2	5.16		Double clamp dimple bar
	<b>120404FS4</b>	●	12.7	4.76	0.4	5.16		P type boring bar
	<b>120408FS4</b>	●	12.7	4.76	0.8	5.16		D type boring head
	<b>120412FS4</b>	●	12.7	4.76	1.2	5.16		LL cartridge
	<b>120404TA4</b>	●	12.7	4.76	0.4	5.16		
	<b>120408TA4</b>	●	12.7	4.76	0.8	5.16		
	<b>120412TA4</b>	●	12.7	4.76	1.2	5.16		
 Multi-corner Type Double Sided	<b>NP-CNGA120404GAWS4</b>	●	12.7	4.76	0.4	5.16		LL holder
	<b>120408GAWS4</b>	●	12.7	4.76	0.8	5.16		Double clamp holder
	<b>120412GAWS4</b>	●	12.7	4.76	1.2	5.16		Double clamp dimple bar
 Multi-corner Type Single Sided	<b>NP-CNGA120404GA2</b>	●	12.7	4.76	0.4	5.16		LL holder
	<b>120408GA2</b>	●	12.7	4.76	0.8	5.16		Double clamp holder
	<b>120412GA2</b>	●	12.7	4.76	1.2	5.16		Double clamp dimple bar
	<b>120404FS2</b>	●	12.7	4.76	0.4	5.16		P type boring bar
	<b>120408FS2</b>	●	12.7	4.76	0.8	5.16		D type boring head
	<b>120412FS2</b>	●	12.7	4.76	1.2	5.16		LL cartridge
	<b>120404TA2</b>	●	12.7	4.76	0.4	5.16		
	<b>120408TA2</b>	●	12.7	4.76	0.8	5.16		
<b>120412TA2</b>	●	12.7	4.76	1.2	5.16			
 Multi-corner Type Single Sided	<b>NP-CNGA120408GAWS2</b>	●	12.7	4.76	0.8	5.16		LL holder
	<b>120412GAWS2</b>	●	12.7	4.76	1.2	5.16		Double clamp holder
 Multi-corner Type Single Sided	<b>BM-CNGM120408TA2</b>	●	12.7	4.76	0.8	5.16		LL holder
	<b>120412TA2</b>	●	12.7	4.76	1.2	5.16		Double clamp holder
 Multi-corner Type Double Sided	<b>NP-DNGA150404GA4</b>	●	12.7	4.76	0.4	5.16		LL holder
	<b>150408GA4</b>	●	12.7	4.76	0.8	5.16		Double clamp holder
	<b>150412GA4</b>	●	12.7	4.76	1.2	5.16		Double clamp dimple bar
	<b>150404FS4</b>	●	12.7	4.76	0.4	5.16		P type boring bar
	<b>150408FS4</b>	●	12.7	4.76	0.8	5.16		D type boring head
	<b>150412FS4</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		
<b>150412TA4</b>	●	12.7	4.76	1.2	5.16			

● : Inventory maintained.


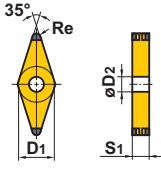

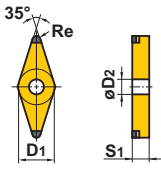

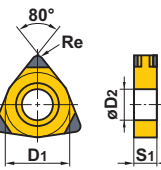

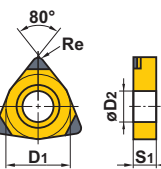
Shape	Order Number	Stock	Dimensions (mm)				Geometry	Holders
			D1	S1	Re	D2		
 Multi-corner Type Single Sided	<b>NEW</b> NP-DNGA110408GA2	●	9.525	4.76	0.8	3.81		LL holder
	150404GA2	●	12.7	4.76	0.4	5.16		Double clamp holder
	150408GA2	●	12.7	4.76	0.8	5.16		Double clamp dimple bar
	150412GA2	●	12.7	4.76	1.2	5.16		P type boring bar
	150404FS2	●	12.7	4.76	0.4	5.16		D type boring head
	150408FS2	●	12.7	4.76	0.8	5.16		
	150412FS2	●	12.7	4.76	1.2	5.16		
	150404TA2	●	12.7	4.76	0.4	5.16		
	150408TA2	●	12.7	4.76	0.8	5.16		
150412TA2	●	12.7	4.76	1.2	5.16			
 Multi-corner Type Single Sided	BM-DNGM150408TA2	●	12.7	4.76	0.8	5.16		LL holder
	150412TA2	●	12.7	4.76	1.2	5.16		Double clamp holder
 Multi-corner Type Double Sided	NP-TNGA160404GA6	●	9.525	4.76	0.4	3.81		LL holder
	160408GA6	●	9.525	4.76	0.8	3.81		Double clamp holder
	160412GA6	●	9.525	4.76	1.2	3.81		ML type boring bar
	160404FS6	●	9.525	4.76	0.4	3.81		WP type boring bar
	160408FS6	●	9.525	4.76	0.8	3.81		Double clamp dimple bar
	160412FS6	●	9.525	4.76	1.2	3.81		P type boring bar
	160404TA6	●	9.525	4.76	0.4	3.81		D type boring head
	160408TA6	●	9.525	4.76	0.8	3.81		LL cartridge
	160412TA6	●	9.525	4.76	1.2	3.81		
 Multi-corner Type Single Sided	NP-TNGA160404GA3	●	9.525	4.76	0.4	3.81		LL holder
	160408GA3	●	9.525	4.76	0.8	3.81		Double clamp holder
	160412GA3	●	9.525	4.76	1.2	3.81		ML type boring bar
	160404FS3	●	9.525	4.76	0.4	3.81		WP type boring bar
	160408FS3	●	9.525	4.76	0.8	3.81		Double clamp dimple bar
	160412FS3	●	9.525	4.76	1.2	3.81		P type boring bar
	160404TA3	●	9.525	4.76	0.4	3.81		D type boring head
	160408TA3	●	9.525	4.76	0.8	3.81		LL cartridge
	160412TA3	●	9.525	4.76	1.2	3.81		
 Multi-corner Type Single Sided	BM-TNGM160408TA3	●	9.525	4.76	0.8	3.81		LL holder
	160412TA3	●	9.525	4.76	1.2	3.81		Double clamp holder
							ML type boring bar	
							WP type boring bar	
							Double clamp dimple bar	
							P type boring bar	
							D type boring head	
							LL cartridge	

# BC8020

## Inserts


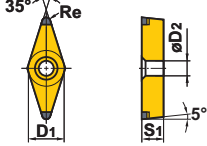

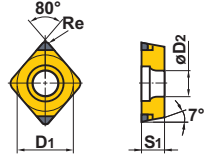

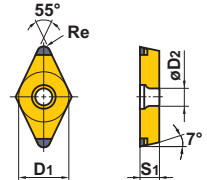

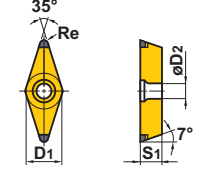

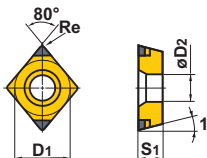

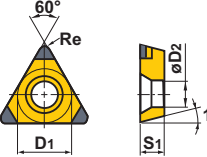
### ● Negative Inserts

Horning : GA :General purpose cutting FS :Continuous cutting TA :Interrupted cutting

Shape	Order Number	Stock	Dimensions (mm)				Geometry	Holders
			D1	S1	Re	D2		
 Multi-corner Type Double Sided	<b>NP-VNGA160404GA4</b>	●	9.525	4.76	0.4	3.81		Double clamp holder MP type boring bar Double clamp dimple bar D type boring head
	<b>160408GA4</b>	●	9.525	4.76	0.8	3.81		
	<b>160412GA4</b>	●	9.525	4.76	1.2	3.81		
	<b>160404FS4</b>	●	9.525	4.76	0.4	3.81		
	<b>160408FS4</b>	●	9.525	4.76	0.8	3.81		
	<b>160412FS4</b>	●	9.525	4.76	1.2	3.81		
	<b>160404TA4</b>	●	9.525	4.76	0.4	3.81		
	<b>160408TA4</b>	●	9.525	4.76	0.8	3.81		
 Multi-corner Type Single Sided	<b>NP-VNGA160404GA2</b>	●	9.525	4.76	0.4	3.81		Double clamp holder MP type boring bar Double clamp dimple bar D type boring head
	<b>160408GA2</b>	●	9.525	4.76	0.8	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 type boring bar Double clamp dimple bar D type boring bar
	<b>NP-WNGA080408GA3</b>	●	12.7	4.76	0.8	5.16		
 Multi-corner Type Single Sided	<b>NP-WNGA080408GA3</b>	●	12.7	4.76	0.8	5.16		LL holder Double clamp holder MP type boring bar Double clamp dimple bar D type boring bar

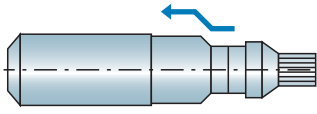
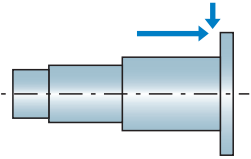
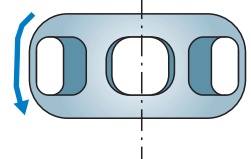
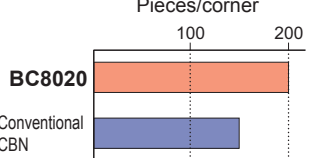
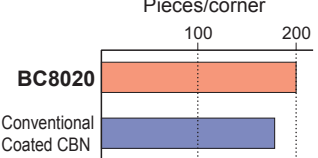
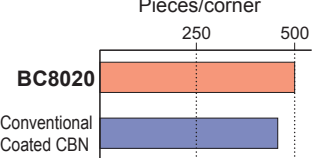
● : Inventory maintained.

## ● Positive Inserts

Shape	Order Number	Stock	Dimensions (mm)				Geometry	Holders
			D1	S1	Re	D2		
 Multi-corner Type Single Sided	<b>NP-VBGW160404GA2</b>	●	9.525	4.76	0.4	4.4		Dimple bar
	<b>160408GA2</b>	●	9.525	4.76	0.8	4.4		
	<b>160404FS2</b>	●	9.525	4.76	0.4	4.4		
	<b>160408FS2</b>	●	9.525	4.76	0.8	4.4		
 Multi-corner Type Single Sided	<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>060202FS2</b>	●	6.35	2.38	0.2	2.8		
	<b>060204FS2</b>	●	6.35	2.38	0.4	2.8		
	<b>09T302FS2</b>	●	9.525	3.97	0.2	4.4		
	<b>09T304FS2</b>	●	9.525	3.97	0.4	4.4		
 Multi-corner Type Single Sided	<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>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>070202FS2</b>	●	6.35	2.38	0.2	2.8		
	<b>070204FS2</b>	●	6.35	2.38	0.4	2.8		
	<b>11T302FS2</b>	●	9.525	3.97	0.2	4.4		
	<b>11T304FS2</b>	●	9.525	3.97	0.4	4.4		
	<b>11T308FS2</b>	●	9.525	3.97	0.8	4.4		
 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		
	<b>160404FS2</b>	●	9.525	4.76	0.4	4.4		
	<b>160408FS2</b>	●	9.525	4.76	0.8	4.4		
 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>080204FS2</b>	●	7.94	2.38	0.4	3.5		
	<b>080208FS2</b>	●	7.94	2.38	0.8	3.5		
 Multi-corner Type Single Sided	<b>NP-TPGB110304GA3</b>	●	6.35	3.18	0.4	3.4		Dimple bar
	<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		
	<b>110304FS3</b>	●	6.35	3.18	0.4	3.4		
	<b>110308FS3</b>	●	6.35	3.18	0.8	3.4		
	<b>160304FS3</b>	●	9.525	3.18	0.4	4.4		
<b>160308FS3</b>	●	9.525	3.18	0.8	4.4			

# General Purpose Coated CBN Grade for Hardened Steel

## Application Examples

Insert		<b>BM-DNGM150408TA2</b>	<b>NP-CNGA120408GA2</b>	<b>NP-CNGA120408GA2</b>
Workpiece		Hardened steel (60HRC) 	Hardened steel (60HRC) 	Hardened steel (60HRC) 
Component		Gear parts	Shaft	Joint parts
Cutting Conditions	Cutting Speed (m/min)	130	130	120
	Feed (mm/rev)	0.12	0.15	0.15
	Depth of Cut (mm)	0.25	0.5	0.15
Coolant		Dry	Wet	Dry
Results		<p>Pieces/corner</p>  <p>Conventional CBN tool life was reached at 150 parts, whereas BC8020 offered stable machining of up to 200 parts.</p>	<p>Pieces/corner</p>  <p>Conventional coated CBN resulted in 180 parts, whereas the BC8020 was able to machine up to 200 parts with high stability.</p>	<p>Pieces/corner</p>  <p>Conventional CBN tool life was reached at 450 parts, whereas BC8020 could machine up to 500 parts.</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. ●When using rotating tools, please make a trial run to check run-out, vibration and abnormal sounds etc.

## MITSUBISHI MATERIALS CORPORATION

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