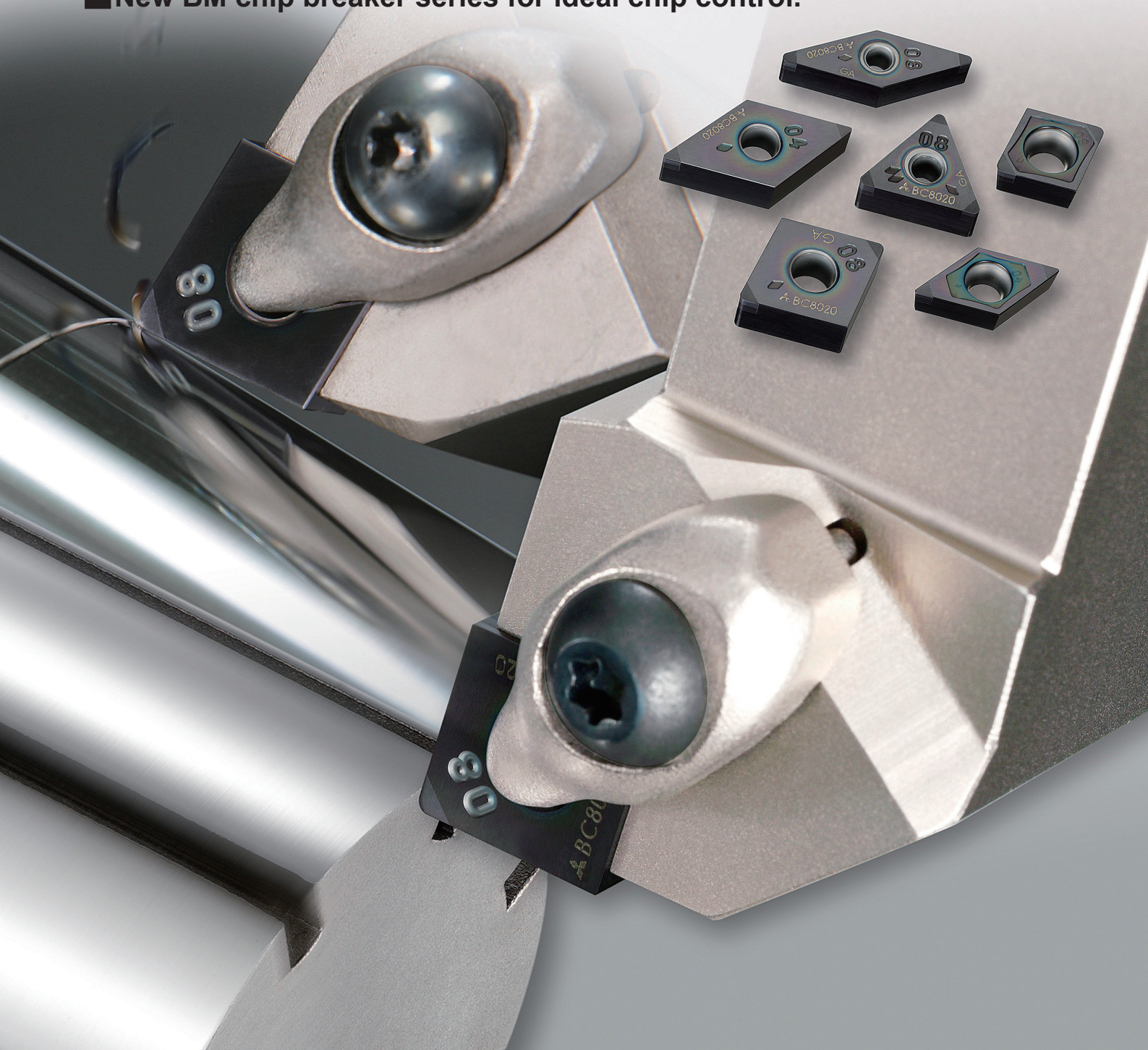


# **BC8020**

## **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 chip breaker series for ideal chip control.





# BC8020

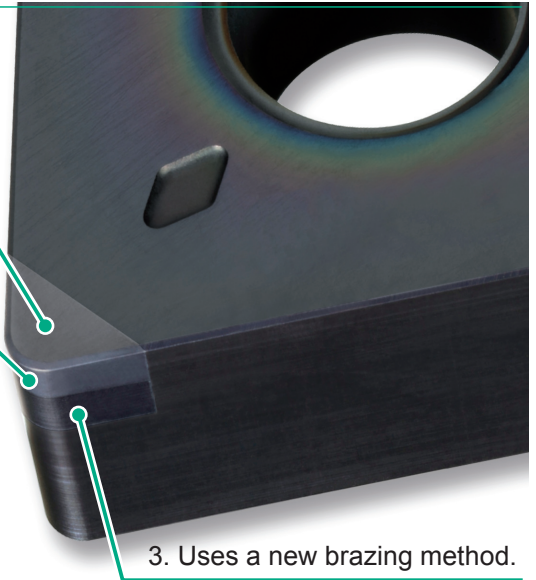
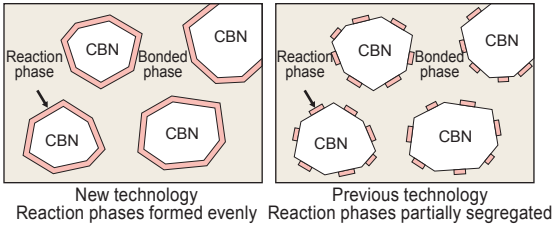
## Features

### 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

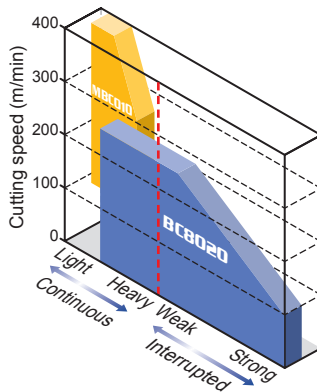
1. Contains high toughness CBN particles.
2. Uses Mitsubishi's unique "Particle-activated Sintering" Method".



### Wide application range

- For continuous through to interrupted machining.
- High crater wear resistance enables large depth of cut machining such as removal of carbonized layers.

### Application Range

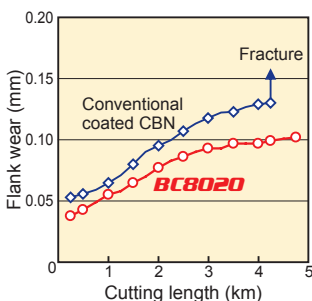


### Recommended Cutting Conditions

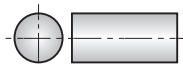
Work Material	Cutting Mode	Cutting Speed (m/min)				Feed (mm/rev)	Depth of Cut (mm)	Coolant
		50	100	200	300			
Hardened Steel (Tempered steel)	Continuous cutting	----- ----- ----- -----				-0.3	-0.8	Wet, Dry
	Interrupted cutting	----- ----- ----- -----				-0.2	-0.3	Dry

## Cutting Performance

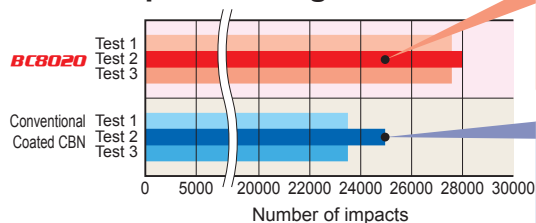
### Continuous cutting



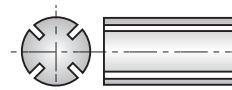
<Cutting conditions>  
Workpiece : Hardened steel (60HRC)  
Insert : NP-CNGA120408GA  
Cutting speed : 180m/min  
Feed : 0.1mm/rev  
Depth of cut : 0.1mm (Dry)



### Interrupted cutting



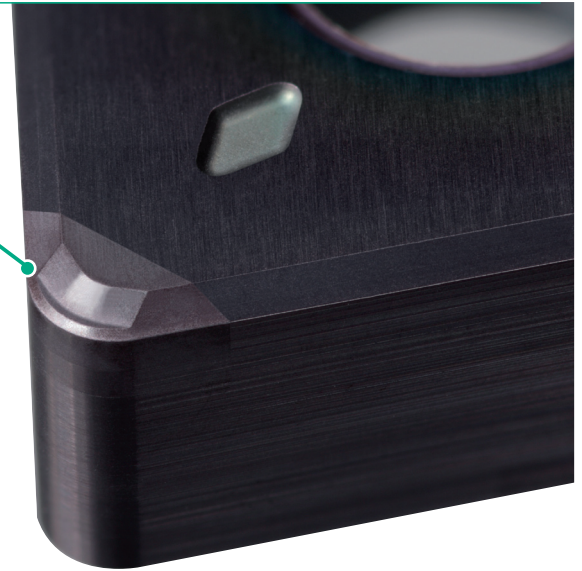
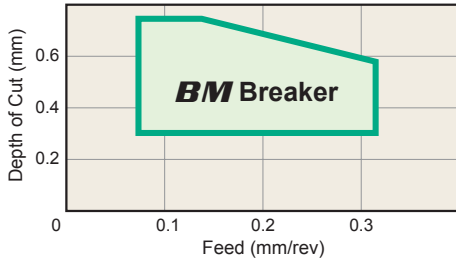
<Cutting conditions>  
Workpiece : Hardened steel (60HRC)  
Insert : NP-CNGA120408GA  
Cutting speed : 150m/min  
Feed : 0.15mm/rev  
Depth of cut : 0.15mm (Dry)



# Breaker Insert

## Features

- Effective chip control when removing hardened outer layers.
- Prevents damage caused by chip elongation.



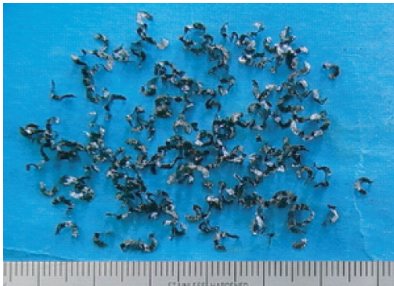
## Recommended Cutting Conditions

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

## Cutting Performance

### Wear resistance

- Chip geometry from BC8020-BM breaker



<Cutting conditions>  
 Workpiece : Hardened steel (60HRC)  
 Insert : BM-CNGM120408TA  
 Cutting speed : 180m/min  
 Feed : 0.2mm/rev  
 Depth of cut : 0.5mm  
 Continuous cutting (Wet)

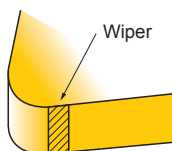


## Wiper Insert

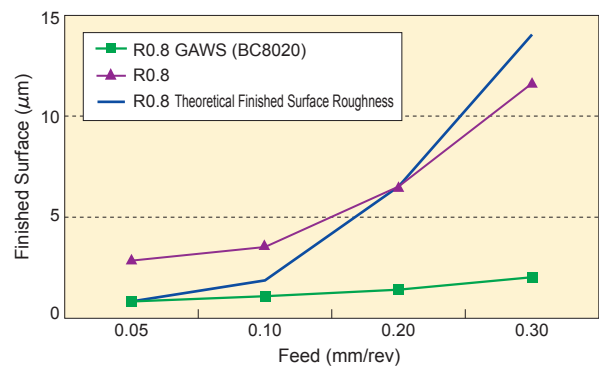
### Features

- Achieves superior surface finishes with a high feed rate.
- Shortens machining time.

### NP-CNGA120408GAWS4



### Surface roughness


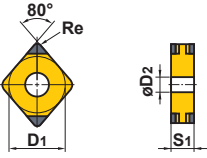

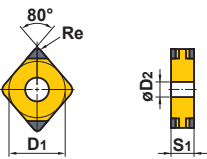

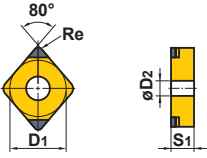

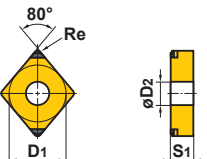

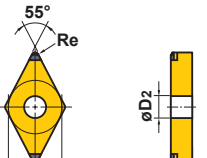

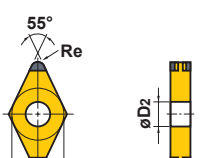


<Cutting Conditions>  
 Workpiece : Hardened steel (HRC60)      Depth of Cut : 0.1mm  
 Insert : NP-CNGA120408GAWS4      Dry Cutting  
 Cutting Speed : 120m/min

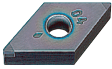
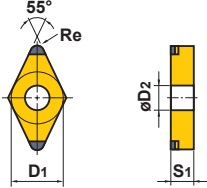
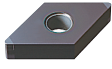
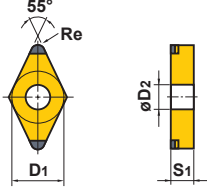

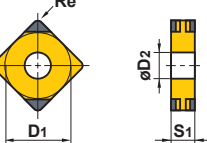

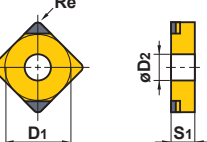
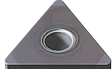
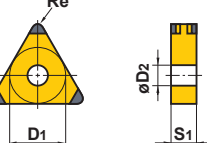
# General Purpose Coated CBN Grade for Hardened Steel

## ● Negative Inserts

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

Shape	Order Number	Stock	Dimensions (mm)				Geometry
			D1	S1	Re	D2	
 Multi-corner Type Double Sided	<b>NP-CNGA12040GA4</b>	●	12.7	4.76	0.4	5.16	
	<b>120408GA4</b>	●	12.7	4.76	0.8	5.16	
	<b>120412GA4</b>	●	12.7	4.76	1.2	5.16	
	<b>120404FS4</b>	★	12.7	4.76	0.4	5.16	
	<b>120408FS4</b>	★	12.7	4.76	0.8	5.16	
	<b>120412FS4</b>	★	12.7	4.76	1.2	5.16	
	<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-CNGA12040GAWS4</b>	★	12.7	4.76	0.4	5.16	
	<b>120408GAWS4</b>	★	12.7	4.76	0.8	5.16	
	<b>120412GAWS4</b>	★	12.7	4.76	1.2	5.16	
	<b>120404GSWS4</b>	●	12.7	4.76	0.4	5.16	
	<b>120408GSWS4</b>	●	12.7	4.76	0.8	5.16	
	<b>120412GSWS4</b>	●	12.7	4.76	1.2	5.16	
 Multi-corner Type Single Sided	<b>NP-CNGA12040GA2</b>	★	12.7	4.76	0.4	5.16	
	<b>120408GA2</b>	★	12.7	4.76	0.8	5.16	
	<b>120412GA2</b>	★	12.7	4.76	1.2	5.16	
	<b>120404FS2</b>	●	12.7	4.76	0.4	5.16	
	<b>120408FS2</b>	●	12.7	4.76	0.8	5.16	
	<b>120412FS2</b>	●	12.7	4.76	1.2	5.16	
	<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>BM-CNGM120408TA2</b>	●	12.7	4.76	0.4	5.16	
	<b>120412TA2</b>	●	12.7	4.76	0.8	5.16	
 Multi-corner Type Single Sided	<b>BM-DNGM150408TA2</b>	★	12.7	4.76	0.8	5.16	
	<b>150412TA2</b>	★	12.7	4.76	1.2	5.16	
	<b>150608TA2</b>	●	12.7	6.35	0.8	5.16	
	<b>150612TA2</b>	●	12.7	6.35	1.2	5.16	
 Multi-corner Type Double Sided	<b>NP-DNGA15040GA4</b>	★	12.7	4.76	0.4	5.16	
	<b>150408GA4</b>	★	12.7	4.76	0.8	5.16	
	<b>150412GA4</b>	★	12.7	4.76	1.2	5.16	
	<b>150604GA4</b>	●	12.7	6.35	0.4	5.16	
	<b>150608GA4</b>	●	12.7	6.35	0.8	5.16	
	<b>150612GA4</b>	●	12.7	6.35	1.2	5.16	
	<b>150404FS4</b>	★	12.7	4.76	0.4	5.16	
	<b>150408FS4</b>	★	12.7	4.76	0.8	5.16	
	<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	


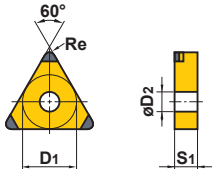
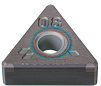
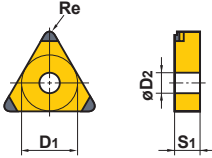

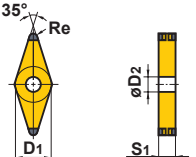
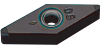
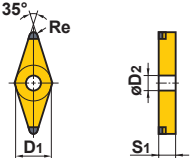
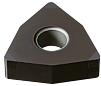
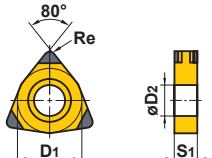
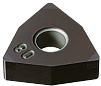
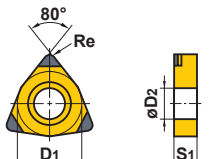
● : Inventory maintained. ★ : Inventory maintained in Japan.

Shape	Order Number	Lager	Dimensions (mm)				Geometry
			D1	S1	Re	D2	
 Multi-corner Type Single Sided	<b>NP-DNGA150404GA2</b>	★	12.7	4.76	0.4	5.16	
	<b>150408GA2</b>	★	12.7	4.76	0.8	5.16	
	<b>150412GA2</b>	★	12.7	4.76	1.2	5.16	
	<b>150404FS2</b>	★	12.7	4.76	0.4	5.16	
	<b>150408FS2</b>	★	12.7	4.76	0.8	5.16	
	<b>150412FS2</b>	★	12.7	4.76	1.2	5.16	
	<b>150604FS2</b>	●	12.7	6.35	0.4	5.16	
	<b>150608FS2</b>	●	12.7	6.35	0.8	5.16	
	<b>150612FS2</b>	●	12.7	6.35	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	
	<b>150412TA2</b>	★	12.7	4.76	1.2	5.16	
	<b>150604TA2</b>	●	12.7	6.35	0.4	5.16	
	<b>150608TA2</b>	●	12.7	6.35	0.8	5.16	
	<b>150612TA2</b>	●	12.7	6.35	1.2	5.16	
 Multi-corner Type Double Sided	<b>NP-DNGA150604GSWS2JR</b>	●	12.7	6.35	0.4	5.16	
	<b>150604GSWS2JL</b>	●	12.7	6.35	0.4	5.16	
	<b>150608GSWS2JR</b>	●	12.7	6.35	0.8	5.16	
	<b>150608GSWS2JL</b>	●	12.7	6.35	0.8	5.16	
 Multi-corner Type Double Sided	<b>NP-SNGA120408GA4</b>	●	12.7	4.76	0.8	5.16	
	<b>120412GA4</b>	●	12.7	4.76	1.2	5.16	
 Multi-corner Type Single Sided	<b>NP-SNGA120408TA2</b>	●	12.7	4.76	0.8	5.16	
	<b>120412TA2</b>	●	12.7	4.76	1.2	5.16	
 Multi-corner Type Double Sided	<b>NP-TNGA160404GA6</b>	●	9.525	4.76	0.4	3.81	
	<b>160408GA6</b>	●	9.525	4.76	0.8	3.81	
	<b>160412GA6</b>	●	9.525	4.76	1.2	3.81	
	<b>160404FS6</b>	★	9.525	4.76	0.4	3.81	
	<b>160408FS6</b>	★	9.525	4.76	0.8	3.81	
	<b>160412FS6</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	


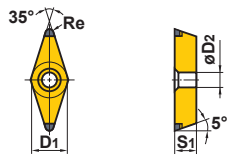
# General Purpose Coated CBN Grade for Hardened Steel

## ● Negative Inserts

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

Shape	Order Number	Stock	Dimensions (mm)				Geometry
			D1	S1	Re	D2	
 Multi-corner Type Single Sided	<b>NP-TNGA160404GA3</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>160404FS3</b>	●	9.525	4.76	0.4	3.81	
	<b>160408FS3</b>	●	9.525	4.76	0.8	3.81	
	<b>160412FS3</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 Single Sided	<b>BM-TNGM160408TA3</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	
	<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	
<b>160412TA4</b>	★	9.525	4.76	1.2	3.81		
 Multi-corner Type Single Sided	<b>NP-VNGA160404GA2</b>	★	9.525	4.76	0.4	3.81	
	<b>160408GA2</b>	★	9.525	4.76	0.8	3.81	
	<b>160404FS2</b>	●	9.525	4.76	0.4	3.81	
	<b>160408FS2</b>	●	9.525	4.76	0.8	3.81	
	<b>160404TA2</b>	●	9.525	4.76	0.4	3.81	
 Multi-corner Type Double Sided	<b>NP-WNGA080408GA6</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	
	<b>080408FS3</b>	●	12.7	4.76	0.8	5.16	
	<b>080408TA3</b>	●	12.7	4.76	0.8	5.16	


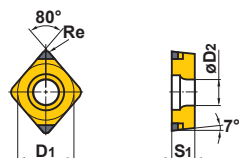

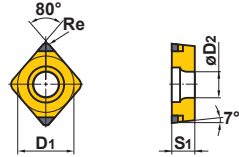

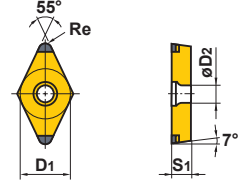

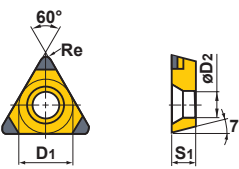

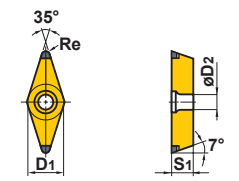
## ● 5° Positive Inserts

Shape	Order Number	Stock	Dimensions (mm)				Geometry
			D1	S1	Re	D2	
 Multi-corner Type Single Sided	<b>NP-VBGW110304GA2</b>	●	6.35	3.18	0.4	2.85	
	<b>160404GA2</b>	●	9.525	4.76	0.4	4.43	
	<b>160408GA2</b>	●	9.525	4.76	0.8	4.43	
	<b>110304FS2</b>	●	6.35	3.18	0.4	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>160408TA2</b>	●	9.525	4.76	0.8	4.43	

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




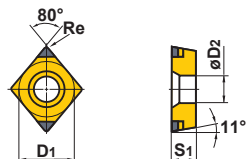

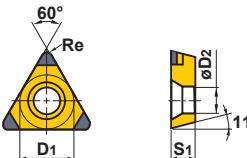
● 7° Positive Inserts

Shape	Order Number	Stock	Dimensions (mm)				Geometry
			D1	S1	Re	D2	
 Multi-corner Type Single Sided	<b>NP-CCGW060202GA2</b>	●	6.35	2.38	0.2	2.8	
	<b>060204GA2</b>	●	6.35	2.38	0.4	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>060204GN2</b>	●	6.35	2.38	0.4	2.8	
	<b>09T304GN2</b>	●	9.525	3.97	0.4	4.4	
	<b>09T308GN2</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	
	<b>09T308FS2</b>	●	9.525	3.97	0.8	4.4	
	<b>09T304TA2</b>	●	9.525	3.97	0.4	4.4	
	<b>09T308TA2</b>	●	9.525	3.97	0.8	4.4	
<b>09T304TN2</b>	●	9.525	3.97	0.4	4.4		
<b>09T308TN2</b>	●	9.525	3.97	0.8	4.4		
 Multi-corner Type Single Sided	<b>NP-CCGW09T304GSWS2</b>	●	9.525	3.97	0.4	4.4	
	<b>09T308GSWS2</b>	●	9.525	3.97	0.8	4.4	
 Multi-corner Type Single Sided	<b>NP-DCGW070202GA2</b>	●	6.35	2.38	0.2	2.8	
	<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>070204GN2</b>	●	6.35	2.38	0.4	2.8	
	<b>11T304GN2</b>	●	9.525	3.97	0.4	4.4	
	<b>11T308GN2</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	
	<b>11T304TA2</b>	●	9.525	3.97	0.4	4.4	
<b>11T308TA2</b>	●	9.525	3.97	0.8	4.4		
<b>11T304TN2</b>	●	9.525	3.97	0.4	4.4		
<b>11T308TN2</b>	●	9.525	3.97	0.8	4.4		
 Multi-corner Type Single Sided	<b>NP-TCGW090204GA3</b>	●	5.56	2.38	0.4	2.5	
	<b>090208GA3</b>	●	5.56	2.38	0.8	2.5	
	<b>110204GA3</b>	●	6.35	2.38	0.4	2.8	
	<b>110208GA3</b>	●	6.35	2.38	0.8	2.8	
	<b>16T304GA3</b>	●	9.525	3.97	0.4	4.4	
	<b>16T308GA3</b>	●	9.525	3.97	0.8	4.4	
	<b>090204FS3</b>	●	5.56	2.38	0.4	2.5	
	<b>110204FS3</b>	●	6.35	2.38	0.4	2.8	
<b>16T304FS3</b>	●	9.525	3.97	0.4	4.4		
 Multi-corner Type Single Sided	<b>NP-VCGW160404GA2</b>	●	9.525	4.76	0.4	4.4	
	<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	
	<b>160408TA2</b>	●	9.525	4.76	0.8	4.4	

# General Purpose Coated CBN Grade for Hardened Steel

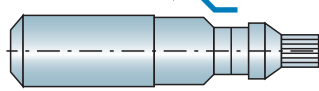
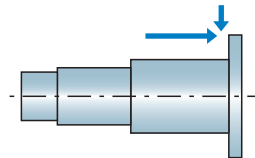
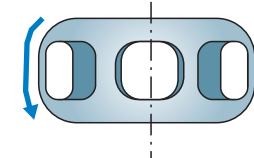
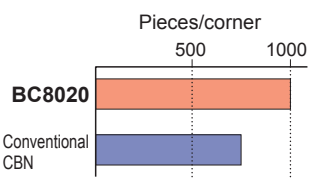
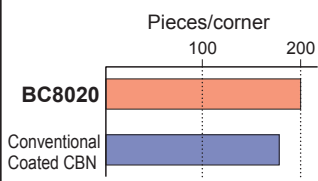
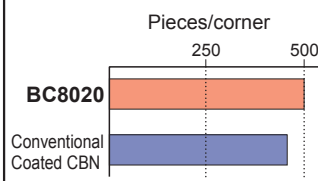
## 11° Positive Inserts

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

Shape	Order Number	Stock	Dimensions (mm)				Geometry
			D1	S1	Re	D2	
 Multi-corner Type Single Sided	<b>NP-CPGB080204GA2</b>	●	7.94	2.38	0.4	3.5	
	<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	
	<b>080204FS2</b>	●	7.94	2.38	0.4	3.5	
	<b>080208FS2</b>	●	7.94	2.38	0.8	3.5	
	<b>090304FS2</b>	●	9.525	3.18	0.4	4.5	
	<b>090308FS2</b>	●	9.525	3.18	0.8	4.5	
 Multi-corner Type Single Sided	<b>NP-TPGB110304GA3</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	
	<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	

● : Inventory maintained.

## Application Examples

Insert	<b>BM-DNGM150408TA2</b>	<b>NP-CNGA120408GA</b>	<b>NP-TNGA160416TA</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)	0.15	0.15	0.15
Coolant	Dry	Wet	Dry	
Results	 Pieces/corner: 500, 1000 Conventional CBN reached 500 parts, BC8020 reached 1000 parts.	 Pieces/corner: 100, 200 Conventional Coated CBN reached 180 parts, BC8020 reached 200 parts.	 Pieces/corner: 250, 500 Conventional CBN reached 450 parts, BC8020 reached 500 parts.	



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