

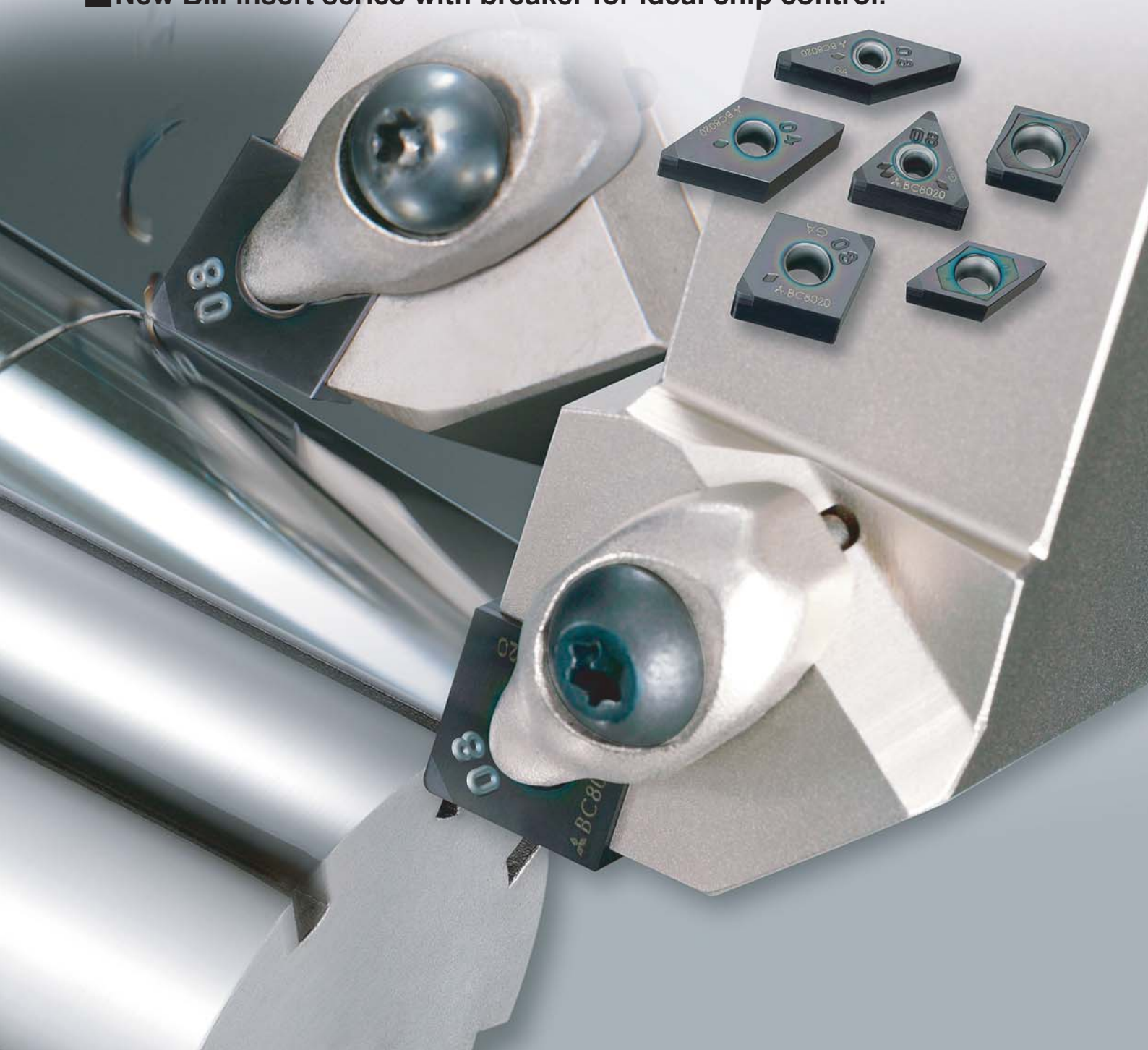
Insert
Expansions!!

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

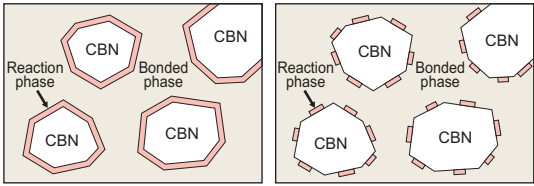
Features

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".



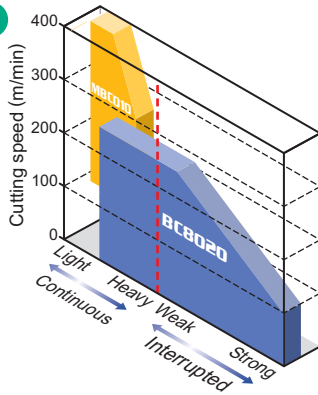
New technology: Reaction phases formed evenly
 Previous technology: Reaction phases partially segregated

3. Uses a new brazing method.

Wide application range

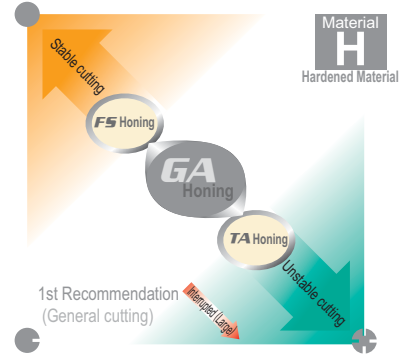
- For machining of hardened steels, it can be used from continuous through to interrupted machining
- High crater wear resistance makes it possible to carry out large depth of cut machining such as removal of carbonized layers.

Application Range



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

Honing



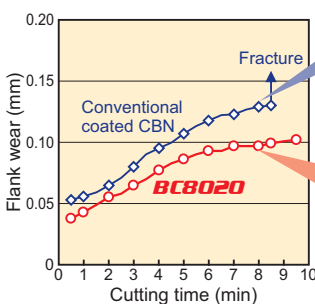
Recommended Cutting Conditions

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	-0.8	Wet, Dry
	Interrupted cutting	[Bar chart showing speed range]				-0.2	-0.3	

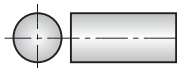
Cutting Performance (1)

Wear resistance

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

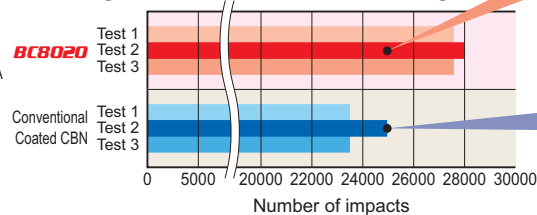


<Cutting conditions>
 Workpiece : JIS SCR420 (60HRC)
 Insert : NP-CNGA120408GA
 Cutting speed : 180m/min
 Feed : 0.15mm/rev
 Depth of cut : 0.5mm
 Continuous cutting (Wet)

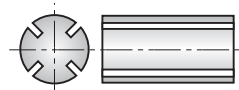


Toughness

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



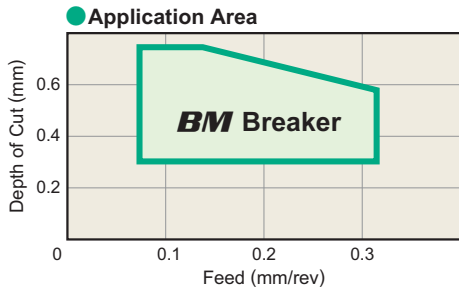
<Cutting conditions>
 Workpiece : JIS SCM415 (60HRC)
 Insert : NP-CNGA120408GA
 Cutting speed : 150m/min
 Feed : 0.15mm/rev
 Depth of cut : 0.15mm
 Interrupted cutting (Dry)



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

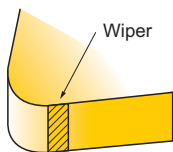
Effective for machining workpieces with low rigidity

- 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.

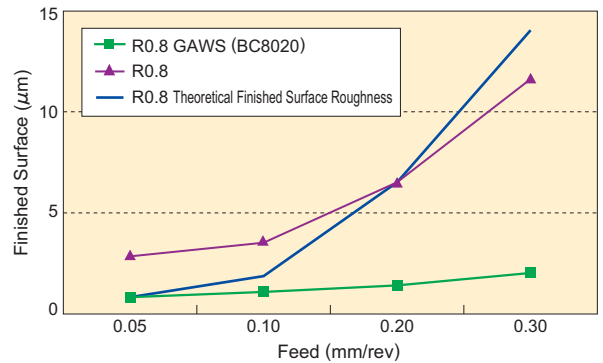
Wiper insert for low rigidity workpieces

NP-CNGA120408GAWS4

WS : General Cutting



Surface roughness



<Cutting Conditions>

Workpiece : Hardened Material (HRC60)

Depth of Cut : 0.1mm

Insert : NP-CNGA120408GAWS4

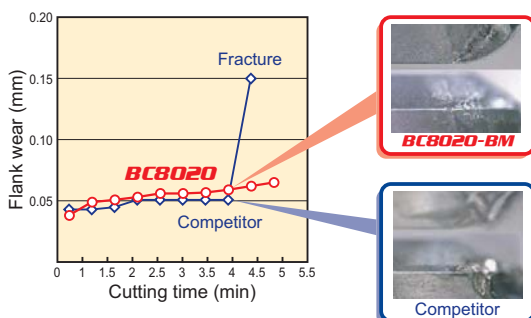
Dry Cutting

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)


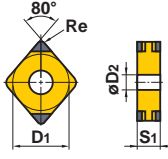

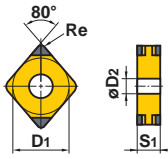

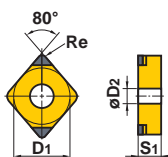

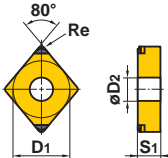

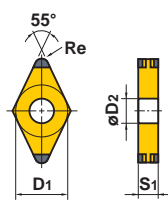


BC8020

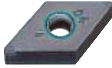
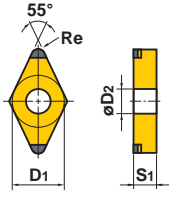

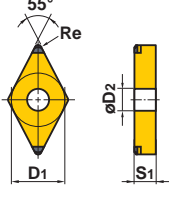

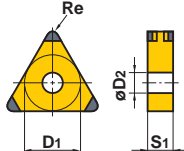

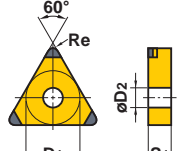

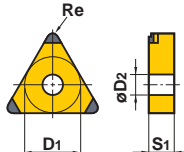
Inserts

● 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		
NEW PETIT CUT NEW  Multi-corner Type Double Sided	NP-CNGA120404GA4	●	12.7	4.76	0.4	5.16		LL holder
	120408GA4	●	12.7	4.76	0.8	5.16		Double clamp holder
	120412GA4	●	12.7	4.76	1.2	5.16		Double clamp dimple bar
	120404FS4	●	12.7	4.76	0.4	5.16		P type boring bar
	120408FS4	●	12.7	4.76	0.8	5.16		D type boring head
	120412FS4	●	12.7	4.76	1.2	5.16		LL cartridge
	120404TA4	●	12.7	4.76	0.4	5.16		
	120408TA4	●	12.7	4.76	0.8	5.16		
NEW PETIT CUT (Wiper) NEW  Multi-corner Type Double Sided	NP-CNGA120404GAWS4	●	12.7	4.76	0.4	5.16		LL holder
	120408GAWS4	●	12.7	4.76	0.8	5.16		Double clamp holder
	120412GAWS4	●	12.7	4.76	1.2	5.16		Double clamp dimple bar
NEW PETIT CUT  Multi-corner Type Single Sided	NP-CNGA120404GA2	●	12.7	4.76	0.4	5.16		LL holder
	120408GA2	●	12.7	4.76	0.8	5.16		Double clamp holder
	120412GA2	●	12.7	4.76	1.2	5.16		Double clamp dimple bar
	120404FS2	●	12.7	4.76	0.4	5.16		P type boring bar
	120408FS2	●	12.7	4.76	0.8	5.16		D type boring head
	120412FS2	●	12.7	4.76	1.2	5.16		LL cartridge
	120404TA2	●	12.7	4.76	0.4	5.16		
	120408TA2	●	12.7	4.76	0.8	5.16		
NEW PETIT CUT (With Breaker) NEW  Multi-corner Type Single Sided	BM-CNGM120408TA2	●	12.7	4.76	0.8	5.16		LL holder
	120412TA2	●	12.7	4.76	1.2	5.16		Double clamp holder
NEW PETIT CUT NEW  Multi-corner Type Double Sided	NP-DNGA150404GA4	●	12.7	4.76	0.4	5.16		LL holder
	150408GA4	●	12.7	4.76	0.8	5.16		Double clamp holder
	150412GA4	●	12.7	4.76	1.2	5.16		Double clamp dimple bar
	150404FS4	●	12.7	4.76	0.4	5.16		P type boring bar
	150408FS4	●	12.7	4.76	0.8	5.16		D type boring head
	150412FS4	●	12.7	4.76	1.2	5.16		
	150404TA4	●	12.7	4.76	0.4	5.16		
	150408TA4	●	12.7	4.76	0.8	5.16		
150412TA4	●	12.7	4.76	1.2	5.16			

● : Inventory maintained.


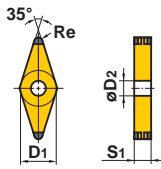

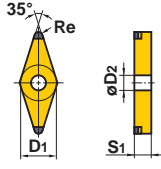

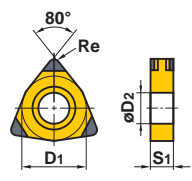

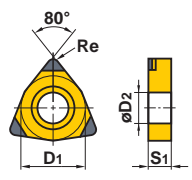
Shape	Order Number	Stock	Dimensions (mm)				Geometry	Holders
			D1	S1	Re	D2		
 Multi-corner Type Single Sided	NP-DNGA150404GA2	●	12.7	4.76	0.4	5.16		LL holder Double clamp holder Double clamp dimple bar P type boring bar D type boring head
	150408GA2	●	12.7	4.76	0.8	5.16		
	150412GA2	●	12.7	4.76	1.2	5.16		
	150404FS2	●	12.7	4.76	0.4	5.16		
	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 <small>NEW</small>	BM-DNGM150408TA2	●	12.7	4.76	0.8	5.16		LL holder Double clamp holder Double clamp dimple bar P type boring bar D type boring head
	150412TA2	●	12.7	4.76	1.2	5.16		
 Multi-corner Type Double Sided <small>NEW</small>	NP-TNGA160404GA6	●	9.525	4.76	0.4	3.81		LL holder 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
	160408GA6	●	9.525	4.76	0.8	3.81		
	160412GA6	●	9.525	4.76	1.2	3.81		
	160404FS6	●	9.525	4.76	0.4	3.81		
	160408FS6	●	9.525	4.76	0.8	3.81		
	160412FS6	●	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		
 Multi-corner Type Single Sided	NP-TNGA160404GA3	●	9.525	4.76	0.4	3.81		LL holder 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
	160408GA3	●	9.525	4.76	0.8	3.81		
	160412GA3	●	9.525	4.76	1.2	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		
 Multi-corner Type Single Sided <small>NEW</small>	BM-TNGM160408TA3	●	9.525	4.76	0.8	3.81		LL holder 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
	160412TA3	●	9.525	4.76	1.2	3.81		

BC8020

Inserts


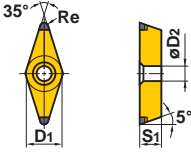

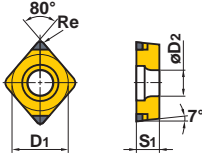

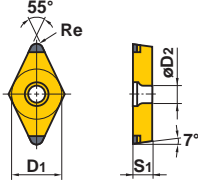

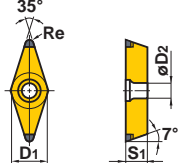

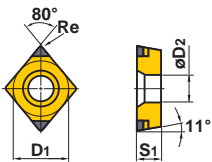

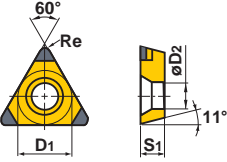
● Negative Inserts

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

Shape	Order Number	Stock	Dimensions (mm)				Geometry	Holders
			D1	S1	Re	D2		
NEW PETIT CUT  Multi-corner Type Double Sided	NP-VNGA160404GA4	●	9.525	4.76	0.4	3.81		Double clamp holder MP type boring bar Double clamp dimple bar D type boring head
	160408GA4	●	9.525	4.76	0.8	3.81		
	160412GA4	●	9.525	4.76	1.2	3.81		
	160404FS4	●	9.525	4.76	0.4	3.81		
	160408FS4	●	9.525	4.76	0.8	3.81		
	160412FS4	●	9.525	4.76	1.2	3.81		
	160404TA4	●	9.525	4.76	0.4	3.81		
	160408TA4	●	9.525	4.76	0.8	3.81		
	160412TA4	●	9.525	4.76	1.2	3.81		
NEW PETIT CUT  Multi-corner Type Single Sided	NP-VNGA160404GA2	●	9.525	4.76	0.4	3.81		Double clamp holder MP type boring bar Double clamp dimple bar D type boring head
	160408GA2	●	9.525	4.76	0.8	3.81		
	160404FS2	●	9.525	4.76	0.4	3.81		
	160408FS2	●	9.525	4.76	0.8	3.81		
	160404TA2	●	9.525	4.76	0.4	3.81		
160408TA2	●	9.525	4.76	0.8	3.81			
NEW PETIT CUT  Multi-corner Type Double Sided	NP-WNGA080408GA6	●	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
NEW PETIT CUT  Multi-corner Type Single Sided	NP-WNGA080408GA3	●	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

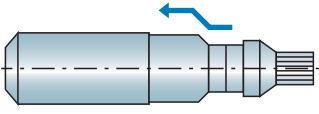
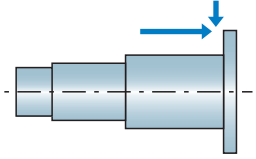
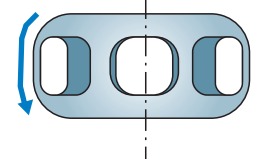
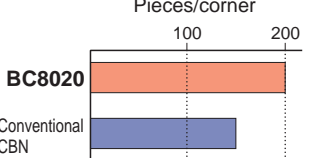
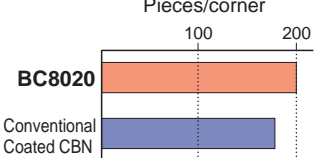
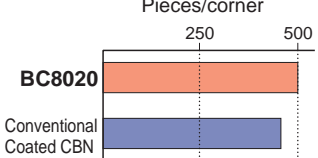
● : Inventory maintained.

● Positive Inserts

Shape	Order Number	Stock	Dimensions (mm)				Geometry	Holders
			D1	S1	Re	D2		
 Multi-corner Type Single Sided	NP-VBGW160404GA2	●	9.525	4.76	0.4	4.43		Dimple bar
	160408GA2	●	9.525	4.76	0.8	4.43		
	160404FS2	●	9.525	4.76	0.4	4.43		
	160408FS2	●	9.525	4.76	0.8	4.43		
 Multi-corner Type Single Sided	NP-CCGW060202GA2	●	6.35	2.38	0.2	2.8		SP holder Small tools S type boring bar
	060204GA2	●	6.35	2.38	0.4	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		
	060202FS2	●	6.35	2.38	0.2	2.8		
	060204FS2	●	6.35	2.38	0.4	2.8		
	09T302FS2	●	9.525	3.97	0.2	4.4		
	09T304FS2	●	9.525	3.97	0.4	4.4		
 Multi-corner Type Single Sided	NP-DCGW070202GA2	●	6.35	2.38	0.2	2.8		SP holder Small tools Dimple bar S type boring bar
	070204GA2	●	6.35	2.38	0.4	2.8		
	11T302GA2	●	9.525	3.97	0.2	4.4		
	11T304GA2	●	9.525	3.97	0.4	4.4		
	11T308GA2	●	9.525	3.97	0.8	4.4		
	070202FS2	●	6.35	2.38	0.2	2.8		
	070204FS2	●	6.35	2.38	0.4	2.8		
	11T302FS2	●	9.525	3.97	0.2	4.4		
	11T304FS2	●	9.525	3.97	0.4	4.4		
 Multi-corner Type Single Sided	NP-VCGW160404GA2	●	9.525	4.76	0.4	4.4		SP holder S type boring bar
	160408GA2	●	9.525	4.76	0.8	4.4		
	160404FS2	●	9.525	4.76	0.4	4.4		
	160408FS2	●	9.525	4.76	0.8	4.4		
 Multi-corner Type Single Sided	NP-CPGB080204GA2	●	7.94	2.38	0.4	3.5		Dimple bar
	080208GA2	●	7.94	2.38	0.8	3.5		
	080204FS2	●	7.94	2.38	0.4	3.5		
	080208FS2	●	7.94	2.38	0.8	3.5		
 Multi-corner Type Single Sided	NP-TPGB110304GA3	●	6.35	3.18	0.4	3.4		Dimple bar
	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		
	110304FS3	●	6.35	3.18	0.4	3.4		
	110308FS3	●	6.35	3.18	0.8	3.4		
	160304FS3	●	9.525	3.18	0.4	4.4		
160308FS3	●	9.525	3.18	0.8	4.4			

General Purpose Coated CBN Grade for Hardened Steel

Application Examples

Insert	BM-DNGM150408TA2	NP-CNGA120408GA	NP-CNGA120408GA	
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 500 parts, whereas BC8020 offered stable machining of up to 1000 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

MMC HARDMETAL (THAILAND) CO.,LTD

8th Fl., Regent House Building, 183 Rajdamri Road, Lumpini, Pathumwan, Bangkok 10330, Thailand

Tel : +66-2651-9800 Fax : +66-2651-9803

Mitsubishi Carbide Home page : <http://www.mitsubishicarbide.com>

(Tools specifications subject to change without notice.)