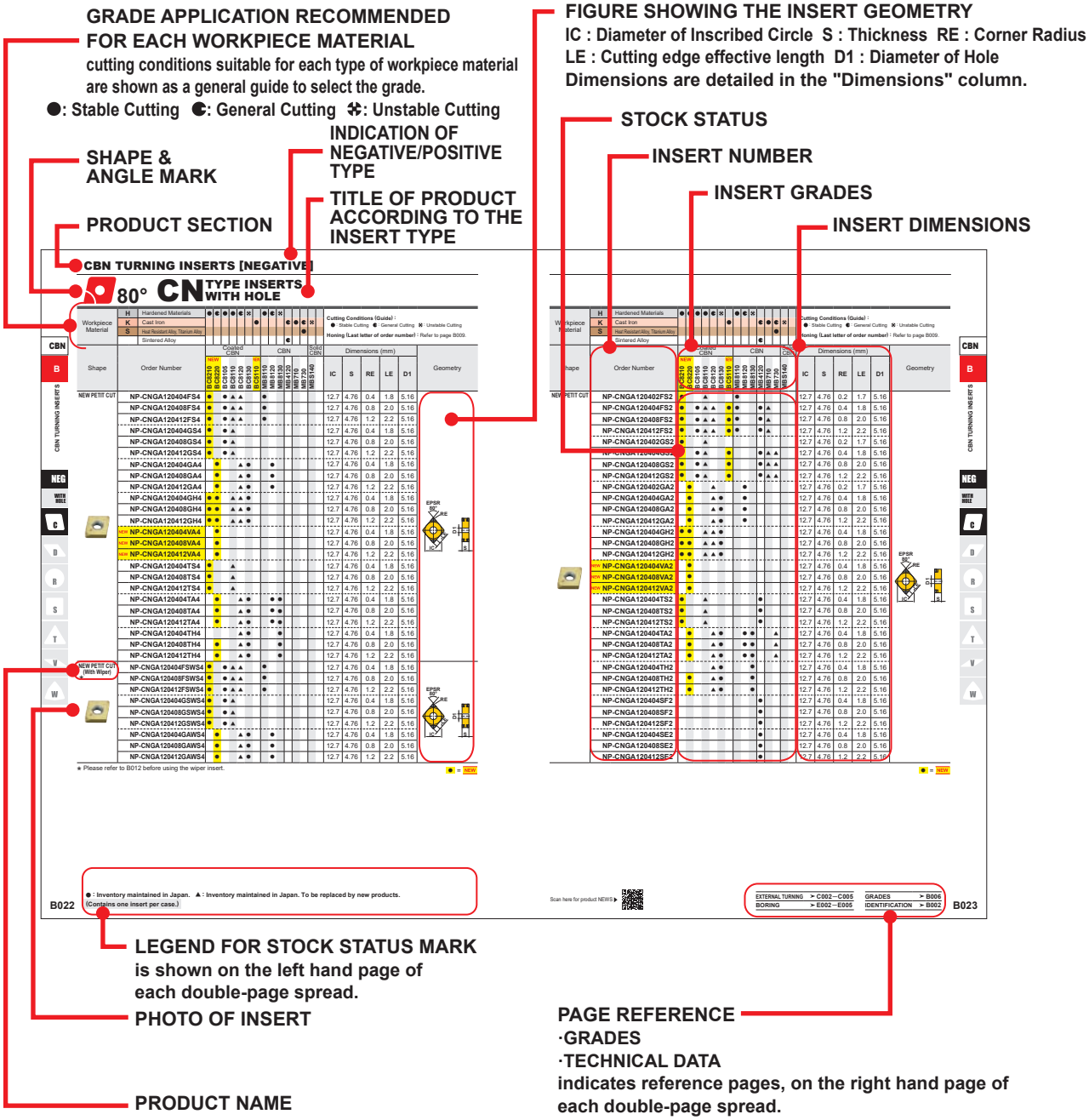
HOW TO READ THE STANDARD OF CBN & PCD TURNING INSERTS

●How this section page is organised

①Organised according to turning insert shape.
(Refer to the index on the next page.)

②Inserts are arranged in order of :

- Negative inserts (with hole→without hole)
- Positive inserts (with hole→without hole)



●To Order : Please specify
①insert number and ②grade.

TURNING TOOLS

CBN & PCD INSERT STANDARDS
CBN & PCD INSERT GRADES

STANDARD OF CBN TURNING INSERTS

NEGATIVE INSERTS WITH HOLE

NEGATIVE INSERTS WITHOUT HOLE

POSITIVE INSERTS WITH HOLE

POSITIVE INSERTS WITHOUT HOLE

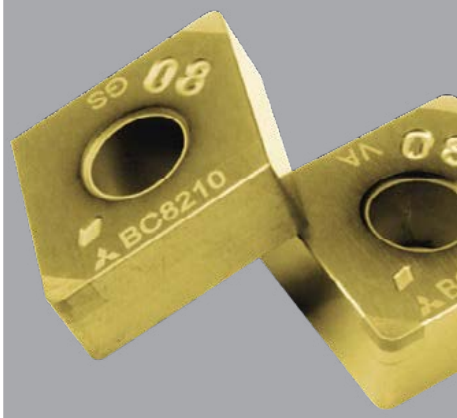
STANDARD OF PCD TURNING INSERTS

NEGATIVE INSERTS WITH HOLE

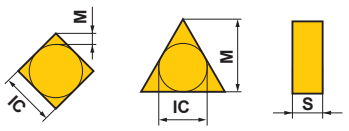
NEGATIVE INSERTS WITHOUT HOLE

POSITIVE INSERTS WITH HOLE

POSITIVE INSERTS WITHOUT HOLE



IDENTIFICATION



Symbol	Tolerance of Nose Height **M** (mm)	Tolerance of Inscribed Circle **IC** (mm)	Tolerance of Thickness **S** (mm)
G	±0.025	±0.025	±0.13
M*	±0.08–±0.18	±0.05–±0.15	±0.13

The surface of insert with * mark is sintered.

Detail of M Class Insert Tolerance

● Tolerance of Nose Height **M** (mm)

D.I.C.	Triangular	Square	Rhombic 80°	Rhombic 55°	Rhombic 35°	Round
6.35	±0.08	±0.08	±0.08	±0.11	±0.16	–
9.525	±0.08	±0.08	±0.08	±0.11	±0.16	–
12.70	±0.13	±0.13	±0.13	±0.15	–	–

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

D.I.C.	Triangular	Square	Rhombic 80°	Rhombic 55°	Rhombic 35°	Round
6.35	±0.05	±0.05	±0.05	±0.05	±0.05	–
9.525	±0.05	±0.05	±0.05	±0.05	±0.05	±0.05
12.70	±0.08	±0.08	±0.08	±0.08	–	±0.08

④ Tolerance Class

BR	For High Depth of Cut
BM	For Medium Depth of Cut
BF	For Finishing
NP	New Petit Cut*
No mark	Standard Type

① Insert Geometry

*Pleaes refer to pages B009 and B015 for further information.

① ④
NP - D N G A
② ③ ⑤

② Insert Shape

Symbol	Insert Shape
C	Rhombic 80°
D	Rhombic 55°
R	Round
S	Square
T	Triangular
V	Rhombic 35°
W	Trigon

③ Normal Clearance

Symbol	Normal Clearance
B	5°
C	7°
D	15°
E	20°
N	0°
P	11°

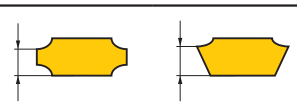
⑤ Fixing and/or for Chip Breaker

Metric

Symbol	Hole	Hole Configuration	Chip Breaker	Figure
W	With Hole	Cylindrical Hole + One Countersink (40–60°)	No	
T/V	With Hole		One Sided	
B	With Hole	Cylindrical Hole + One Countersink (70–90°)	No	
H	With Hole		One Sided	
A	With Hole	Cylindrical Hole	No	
M	With Hole	Cylindrical Hole	One Sided	
N	Without Hole	–	No	
X	–	–	–	Special Design

Diameter of Inscribed Circle (mm)	Symbol						
	R	W	V	D	C	S	T
3.97		02		04	03	03	06
4.76		L3	08	05	04	04	08
5.56		03	09	06	05	05	09
6.35		04	11	07	06	06	11
7.94		05	13	09	08	07	13
9.525	09	06	16	11	09	09	16
12.70	12	08	22	15	12	12	22

⑥ Insert Size



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

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

⑦ Insert Thickness

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

⑧ Insert Corner Configuration

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

⑨ Application (Honing)

Symbol	Honing
FS FA FB F	Continuous Cutting
GS GA GB GH	General Cutting
VA	High-Speed, High Feed Cutting
TS TA TH T	Interrupted Cutting
SF SE	Cutting Sintered Alloys

Refer to Honing on page B009 for details.

⑩ Wiper

WS	For High Rigidity Workpiece Material
WL	For Deflection and Vibration Prevention
No mark	Without Wiper

⑪ Number of Teeth

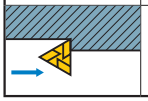
2	2
3	3
4	4
6	6
No mark	1

⑫ Cutting Edge Angle

F	91°
J	93°
No mark	Non Restriction

Please pay special attention when using an indexable insert.

⑬ Cutting Direction

Figure	Hand	Symbol
	Right	R
	Left	L

CLASSIFICATION OF CBN & PCD GRADES

UNCOATED CBN MATERIALS

CBN sintered material based cutting tools are produced by binding CBN (cubic Boron Nitride) and ceramic. Its hardness is next to diamond and it is sintered under ultra-high pressure and high temperature.
CBN has a lower affinity to iron than diamond. The low affinity and high hardness properties mean that sintered CBN delivers a superior cutting performance especially during high-speed machining of materials such hardened steel, cast iron and sintered alloys, etc.

COATED CBN MATERIALS

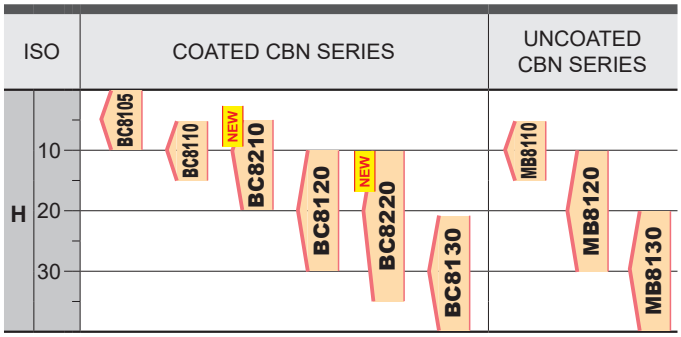
Mitsubishi Materials achieves longer tool life by using a unique "particle-activated sintering method" and combines it with an increased cutting edge strength. This specially developed PVD ceramic coating for CBN grades has a high crater wear resistance, longer tool life, and improved machine efficiency that exceed the conventional CBN grades.

PCD MATERIALS (Sintered Diamond)

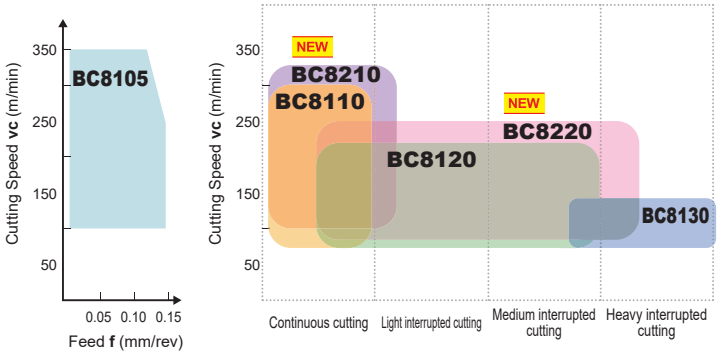
Suitable for cutting materials such as nonferrous metals and fibre reinforced plastics (FRP) including aluminium alloys.
It supports ultra-high-speed finish cutting.

Workpiece materials for turning grades/application area

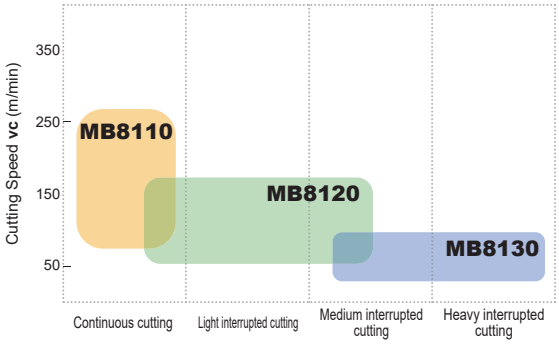
Hardened Steel



COATED CBN MATERIALS



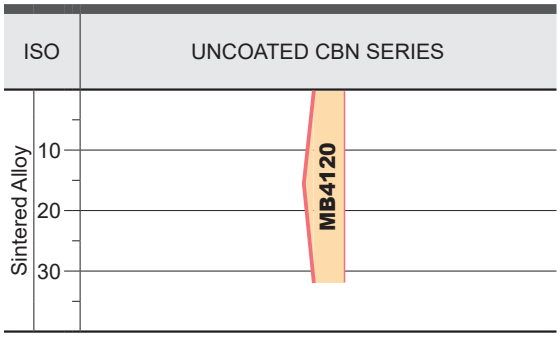
UNCOATED CBN MATERIALS

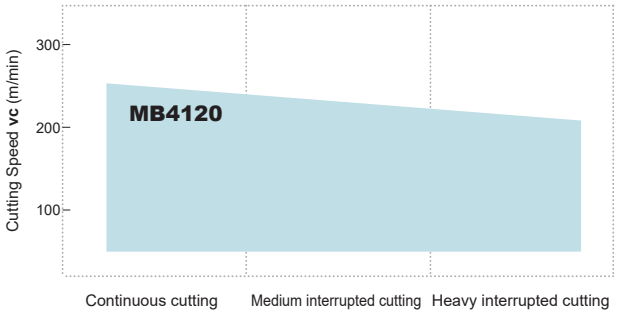


Suitable for finishing with surface roughness Ra 0.6 µm or Rz 2.4 µm or less.

Coated CBN Grades BC8200, BC8100 and Uncoated CBN Grade MB8100 for high hardness steel machining are available in a wide range of areas from finishing to continuous cutting of hardened steels and strongly interrupted machining.

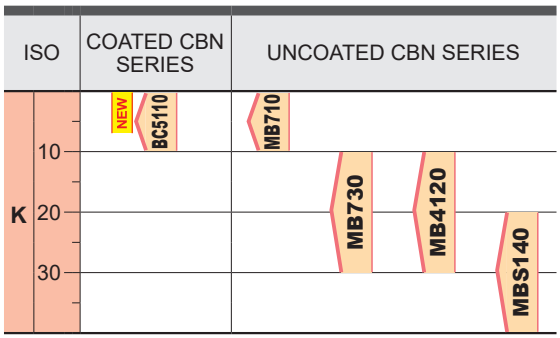
Sintered Alloys

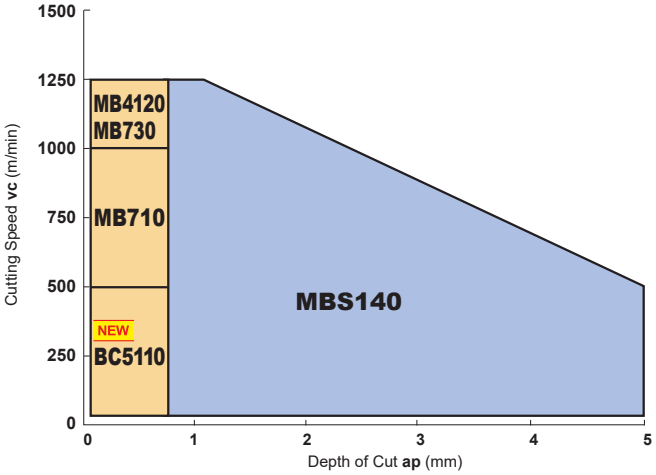




The CBN grade “MB4120” for sintered alloys and cast iron cutting can be used widely from continuous cutting to interrupted cutting in the machining of cast iron such as sintered alloys for valve mechanism parts and oil pump parts.

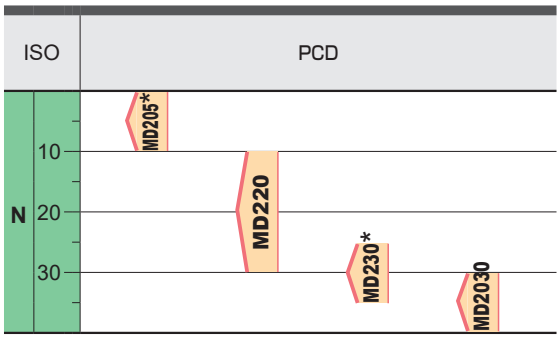
Cast Iron

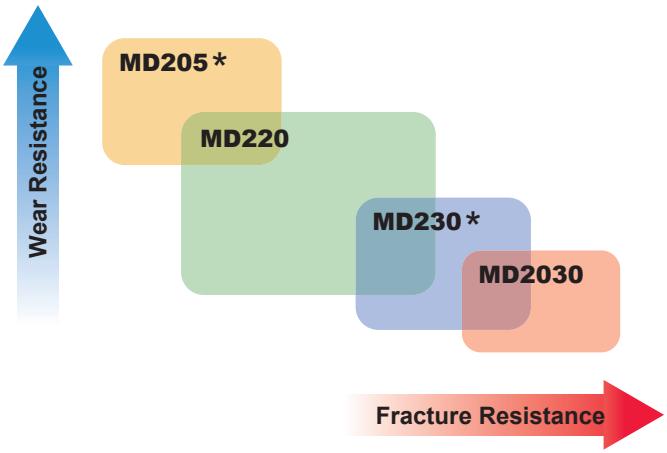




Lineup of grades available from general cutting to cutting of deep depths for high efficiency machining.

Aluminium Alloys





Suitable for cutting materials such as nonferrous metals and fibre reinforced plastics (FRP) including aluminium alloys.
It supports ultra-high-speed finish cutting.

*MD205 and MD230 are produced-to-order products.

Detailed information regarding each grade is available on the website. ▶

INTRODUCTION OF CBN GRADES

Coated CBN Grade for Machining of Hardened Steel

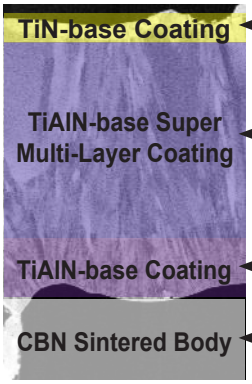
NEW BC8200 series

The new CBN substrate contains a new ultra micro-particle and heat resistant binder that suppress both chipping and crater wear which promotes longer tool life.

BC8210 NEW

- TiN-base Coating: Gold colour assists easy identification of edge use.
- AlCrSiN-base Coating: Excellent chipping resistance. Absorbs impact forces.
- TiAlSiN-base Coating: Excellent wear resistance. Abrasion resistant layer.
- TiAlN-base Coating: Improved strength of adhesion to the CBN substrate prevents peeling. High adhesion layer for BC8210.
- CBN Sintered Body: Excellent crater wear and chipping resistance. Exclusive BC8210 sintered body.

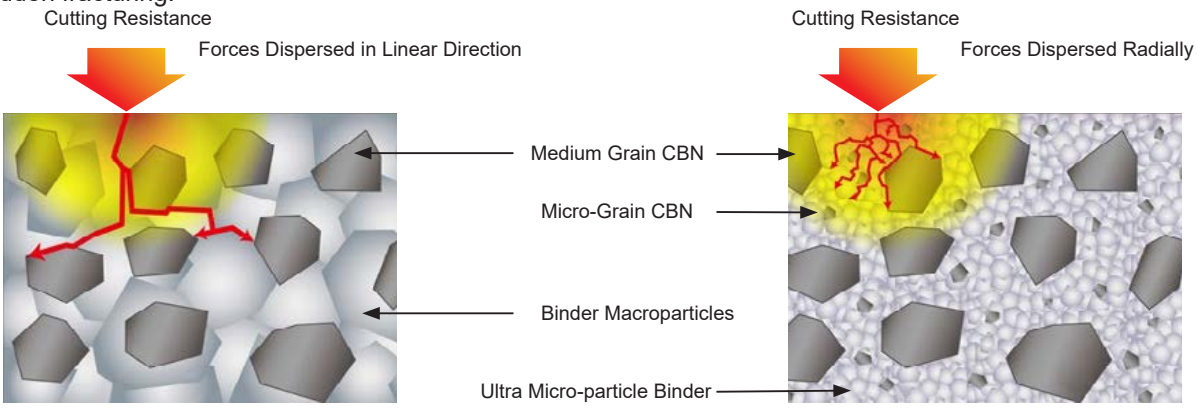
BC8220 NEW



- TiN-base Coating: Gold colour assists easy identification of edge use.
- TiAlN-base Super Multi-Layer Coating: High wear and chipping resistance. Super Multi-Layer.
- TiAlN-base Coating: Improved strength of adhesion to the CBN substrate prevents peeling. High adhesion layer for BC8220.
- CBN Sintered Body: Excellent crater wear and fracture resistance. Exclusive BC8220 sintered body.

Ultra Micro-Particle Binder Prevents Sudden Defects

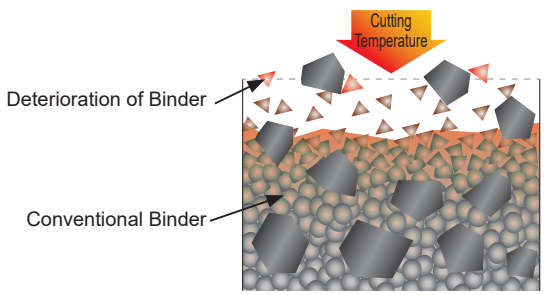
The ultra micro-particle binder cBN added to the CBN base material prevents linear crack development and avoids sudden fracturing.



Conventional | **BC8200, BC8100 Series**

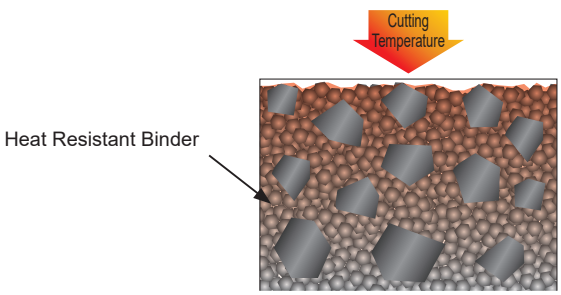
Heat Resistant Binder Suppresses Crater Wear

By increasing the heat reistance of the binder, wear resistance due to the deterioration of the binder component increases, thereby suppressing crater wear, chipping, and fracturing.



As binder wear progresses due to the heat produced during cutting, the CBN particples are exposed and lost.

Conventional



Suppresses the binder wear caused by cutting heat.

BC8200 Series

Coated CBN Grade for Machining Cast Iron

NEW BC5110

BC5110 uses a tough substrate with a remarkably hard coating to provide excellent chipping and wear resistance.

Excellent Chipping Resistance

Compared to conventional grades, the fine grain and high cBN content greatly improve chipping resistance and provide stability and long tool life.

Excellent Wear Resistance Coating

The hard ceramic coating layer provides excellent surface finishes as well as wear and notch resistance during continuous cutting.
Additionally, chipping and peeling of the coating layer is suppressed due to the improved bonding strength to the cBN substrate.

FOR CYLINDER LINER

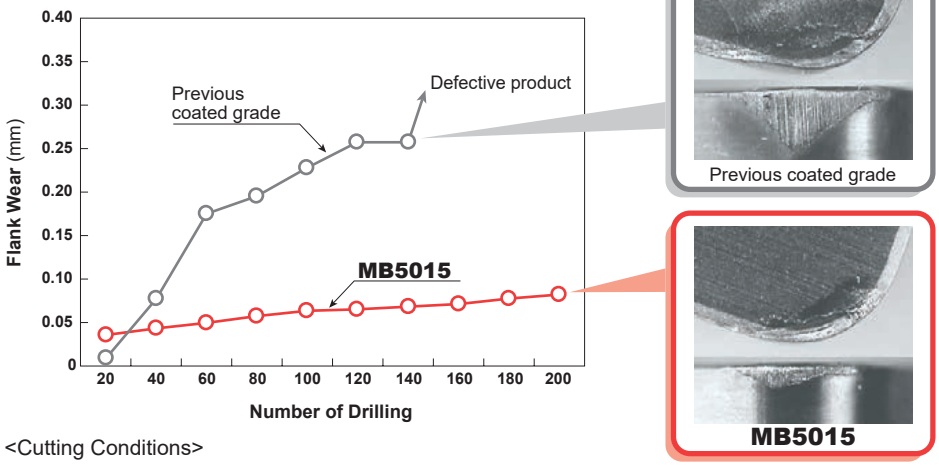
MB5015 *Produced to order only.

MB5015 is an exclusive grade for boring of centrifugal casting cylinder liners in semi finishing or finishing applications with high wear resistance.

■ Recommended Cutting Conditions

Workpiece Material		Cutting Mode	Cutting Speed vc (m/min) 100 500 1000 1500	Feed f (mm/rev)	Depth of Cut ap (mm)	Cutting Mode
Centrifugal casting	Cast Iron	Continuous cutting		–0.3(Finishing) –0.8(Semi-finishing)	–0.05(Finishing) –0.2(Semi-finishing)	Wet Cutting

■ Cutting Performance



<Cutting Conditions>
Workpiece Material : FC200 (Centrifugal casting) ϕ63.0
Cutting Speed : vc=800m/min Feed : f=0.35mm/rev Depth of Cut : ap=0.03mm
Work : Centrifugal casting Cylinder liner Hole Depth : 100mm

CBN

●Heat Treated Steel (Hardened Steel, etc.)

Workpiece Material		Type	Cutting Mode	Recommended Grade	Recommended Cutting Conditions			
					Cutting Speed vc (m/min)	Feed f (mm/rev)	Depth of Cut ap (mm)	Cutting Mode
Structural Steel Esp. Carburized Steel (SC, SCM, SCr) High Alloy Steel (SKD, SKH)	35—65 HRC	Coated	High-speed finishing cutting	**BC8105**	250 (100—350)	≤0.15	≤0.2	Dry,Wet
			Continuous cutting for general purpose	NEW **BC8210** **BC8110**	200 (100—300)	≤0.2	≤0.35	Dry,Wet
				NEW **BC8220** **BC8120**	200 (100—230)	≤0.3	≤0.8	Dry,Wet
			Medium interrupted cutting	NEW **BC8220** **BC8120**	150 (60—200)	≤0.2	≤0.3	Dry,Wet
			Interrupted cutting	**BC8130**	120 (60—150)	≤0.2	≤0.3	Dry,Wet
		Uncoated	Continuous cutting for general purpose	**MB8110**	200 (100—250)	≤0.2	≤0.3	Dry,Wet
				MB8120	150 (80—220)	≤0.2	≤0.5	Dry,Wet
			Medium interrupted cutting	**MB8120**	130 (85—180)	≤0.2	≤0.3	Dry,Wet
			Interrupted cutting	**MB8130**	100 (60—150)	≤0.2	≤0.3	Dry,Wet

●Cast Iron

Workpiece Material		Workpiece Structure	Cutting Speed vc (m/min) 250 500 750 1000 1250	Feed f (mm/rev)	Depth of Cut ap (mm)	Cutting Mode
Gray Cast Iron	JIS FC250	Ferritic + Pearlitic	MBS140; NEW BC5110; MB710; MB730	—0.5	—1.0 MBS140 —5.0	Dry,Wet
	JIS FC300	Pearlitic				
Alloy Cast Iron		Pearlitic		—0.4	—0.5	Dry,Wet
Ductile Cast Iron	JIS FCD400	Ferritic	MB710; MB730	—0.4	—0.5	Dry,Wet
	JIS FCD700	Ferritic + Pearlitic Pearlitic				

Cutting speed of MB4120.

●Sintered Alloy

Workpiece Material	Recommended Grade	Recommended Cutting Conditions		
		Cutting Speed vc (m/min)	Feed f (mm/rev)	Depth of Cut ap (mm)
General Sintered Alloy	**MB4120**	180 (80—300)	—0.2	—0.3
High Density Sintered Alloy	**MB4120**	150 (80—230)	—0.2	—0.3
Sintered Alloy	**MB4120**	130 (80—180)	—0.2	—0.3

●Valve Seat

Amount of Hard Particles	None or Small ← → Large			
Hardness of Workpiece (HV)	150	250	300	350
Plunge Cut	MB4120			
Traverse Cut	MB4120			

●Roll

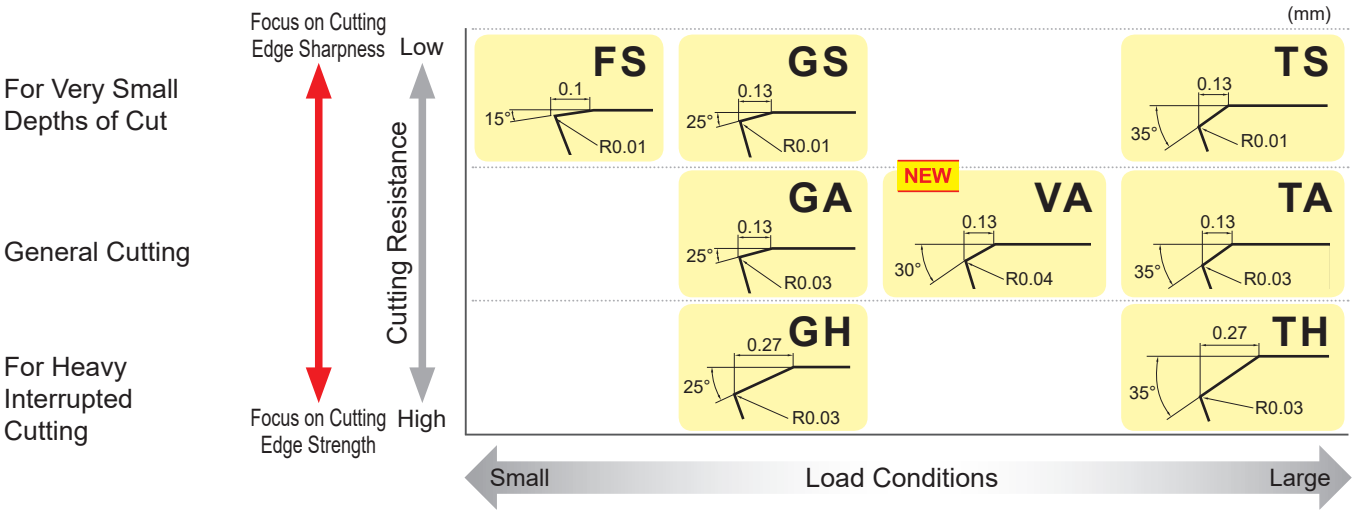
Workpiece Material	Grade	Recommended Cutting Conditions		
		Cutting Speed vc (m/min)	Feed f (mm/rev)	Depth of Cut ap (mm)
Ductile Cast Iron Granular Cast Iron Chilled Cast Iron	**MB710**	80 (30—130)	0.3 (0.1—0.5)	0.2—3.0
High-Speed Steel	**MB730**	50 (20—70)	0.25 (0.1—0.4)	0.1—3.0
Cemented Carbide	**MB730, MBS140**	20 (10—30)	—0.2	—0.2

●Heat Resistant Alloys

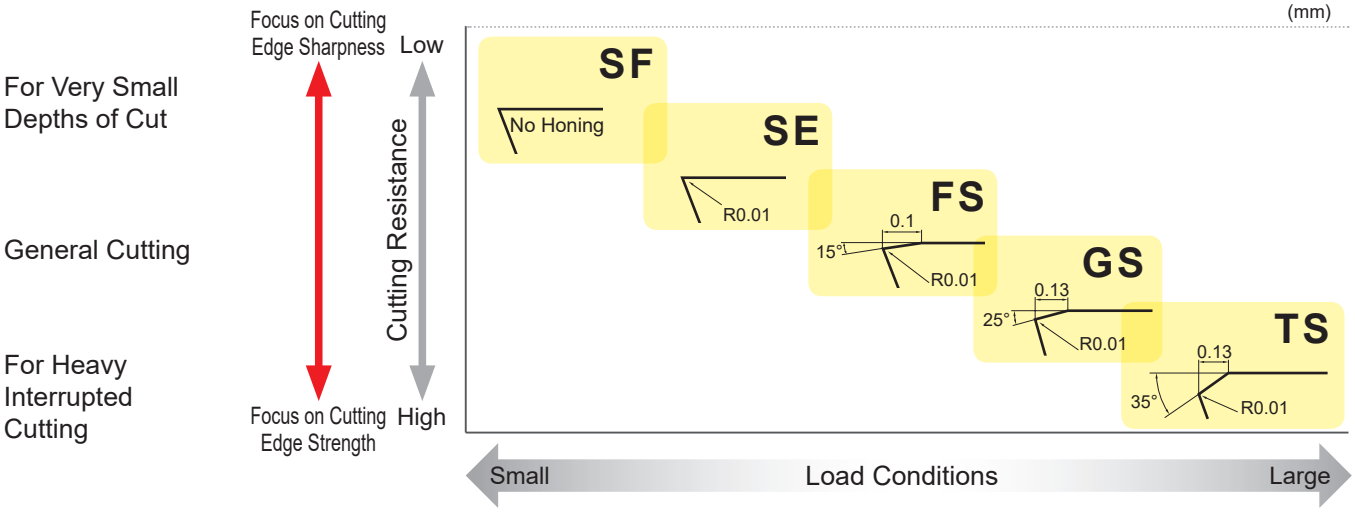
Workpiece Material	Grade	Recommended Cutting Conditions		
		Cutting Speed vc (m/min)	Feed f (mm/rev)	Depth of Cut ap (mm)
Ni Base Heat Resistant Alloy (e.g. Inconel)	**MB730**	120 (100—150)	—0.2	—0.5
Co Base Heat Resistant Alloy (e.g. Stellite)	**MB730**	70 (50—100)	—0.2	—0.5

HONING

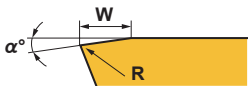
Honing for Machining Hardened Steel



Honing for Machining Sintered Alloys



NP-CNGA120408-GA2



Main Application — Edge Honing Type

(mm)

	A General			S Vibration and burr control			H High efficiency			F Focus on dimensional precision			E Chipping control		
	α	W	R	α	W	R	α	W	R	α	W	R	α	W	R
F Continuous cutting	15°	0.1	0	15°	0.1	0.01	—	—	—	—	—	—	—	—	—
G General cutting	25°	0.13	0.03	25°	0.13	0.01	25°	0.27	0.03	—	—	—	—	—	—
V For high-speed, High feed cutting	30°	0.13	0.04	—	—	—	—	—	—	—	—	—	—	—	—
T Interrupted cutting	35°	0.13	0.03	35°	0.13	0.01	35°	0.27	0.03	—	—	—	—	—	—
S High precision cutting	—	—	—	—	—	—	—	—	—	0°	0	0	0°	0	0.01

Conventional honing shapes
F honing : 0.1mm×15°+R0 **G** honing : 0.13mm×25°+R0.03 **T** honing : 0.13mm×35°+R0.03

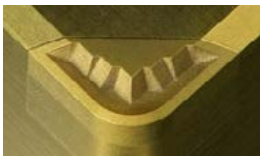
New Petit Cut Series

The surface area of the CBN sintered body has been optimised to allow for a lower price. In adition, tool management is easier because repolishing is not required.

CBN BREAKER INSERT

■Application Area

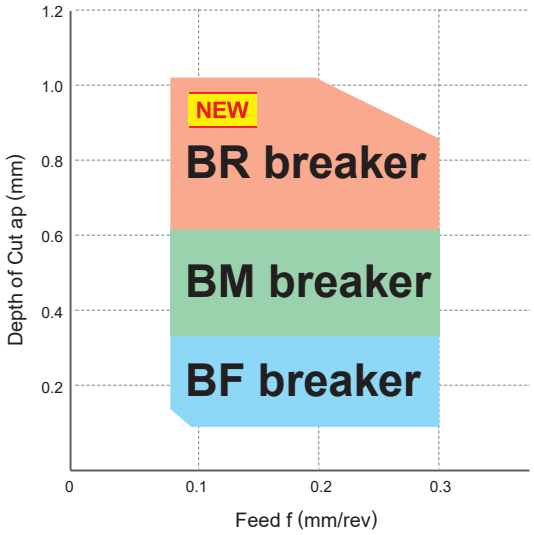
A BR breaker has been added to achieve better chip control at higher depths of cut.
A versatile range of chip breakers is available for a wide range of applications.



BR breaker

BM breaker

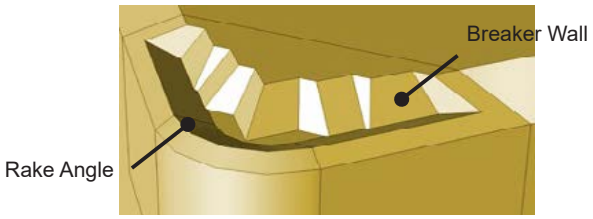
BF breaker

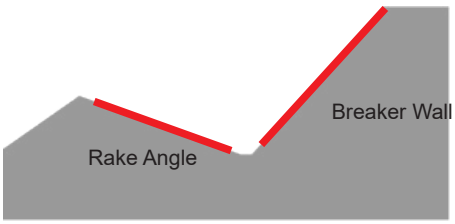


NEW BR Breaker (BC8220)

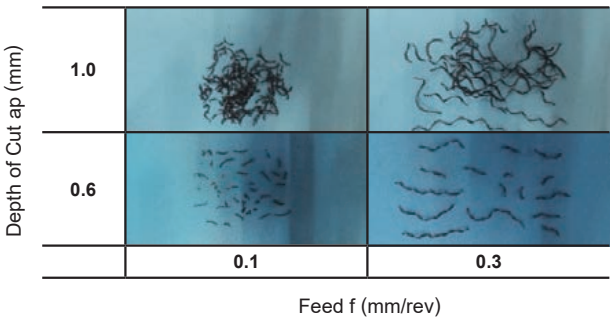
The number of passes needed is reduced and chip control during high depths of cut is also improved.
Chips are formed with the effect from the rake angle, and the multi stage breaker wall supports a wide range of cuts.

Recommended Cutting Conditions : vc=80—200 m/min, f ≤0.3 mm/rev, ap=0.6—1.0 mm





Achieves ideal chip control even at high depths of cut.

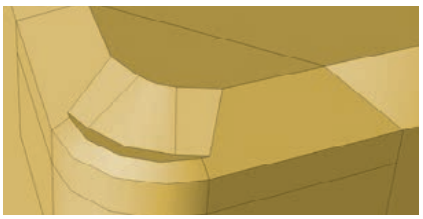


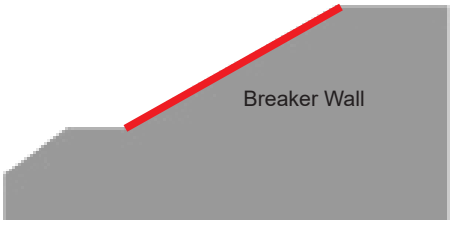
<Cutting Conditions>
Workpiece Material : SCr420 (60 HRC)
Insert : BR-CNGM120408TA2
Cutting Speed : vc=200 m/min
Feed : f=0.1 mm/rev
0.3 mm/rev
Depth of Cut : ap=0.6 mm
1.0 mm
Cutting Mode : Wet Cutting

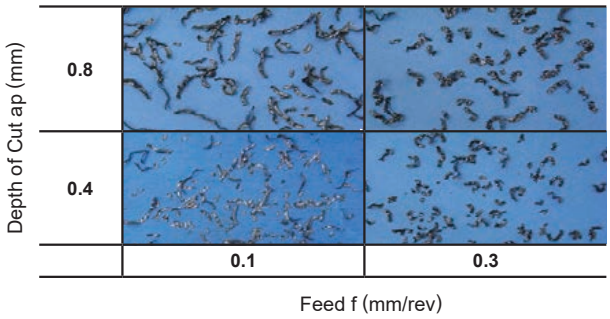
BM Breaker (BC8220)

Great chip control when machining at medium depths of cut. (0.3－0.8 mm)

Recommended Cutting Conditions : vc=80－200 m/min, f ≤0.3 mm/rev, ap=0.3－0.8 mm





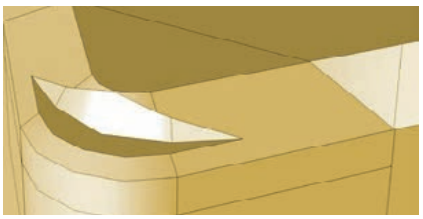


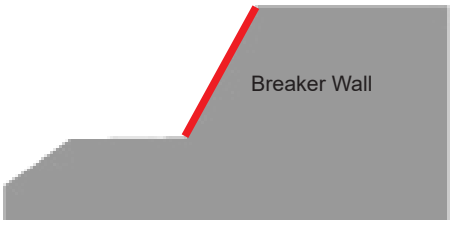
<Cutting Conditions>
Workpiece Material : SCM415 (60 HRC)
Insert : BM-CNGM120408TA2
Cutting Speed : vc=160 m/min
Feed : f=0.1 mm/rev
0.3 mm/rev
Depth of Cut : ap=0.4 mm
0.8 mm
Cutting Mode : Wet Cutting

BF Breaker (BC8210, BC8220)

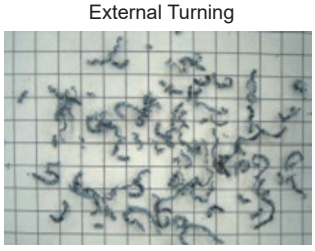
Achieves excellent chip control while finish cutting at depths of 0.3 mm or less.

Recommended Cutting Conditions : vc=80－200 m/min, f ≤0.3 mm/rev, ap=0.1－0.3 mm



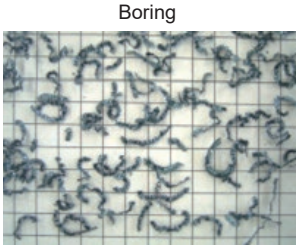


External Turning



Cutting Speed : vc=100 m/min
Feed : f=0.2 mm/rev
Depth of Cut : ap=0.3 mm

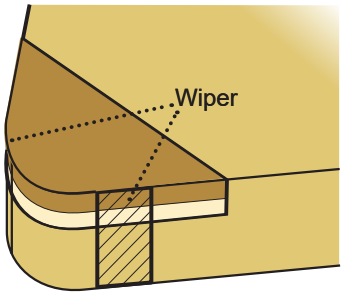
Boring



Cutting Speed : vc=120 m/min
Feed : f=0.2 mm/rev
Depth of Cut : ap=0.3 mm

<Cutting Conditions>
Workpiece Material : SCM415 (60 HRC)
Insert : BF-CNGM120408TS2
Cutting Mode : Wet Cutting

WIPER INSERT



Improving Surface Finish

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

Improving Efficiency

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

Increased Tool Life

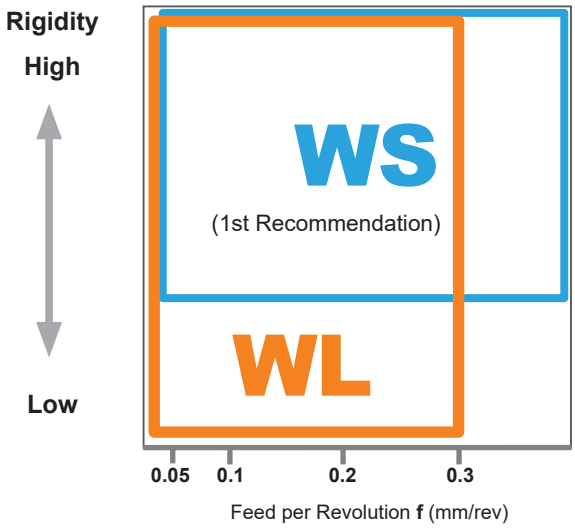
When changed to high feed conditions, the time required to cut one component is decreased, thus more parts can be machined with each insert. In addition, the high feed rate prevents rubbing, therefore, delaying the progression of wear and increasing the tool life of the insert.

Improving Chip Control

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

■ Application of Wiper Inserts

The most recommended wiper shape is the WS Wiper. If deflection or chatter occur, use the WL Wiper.

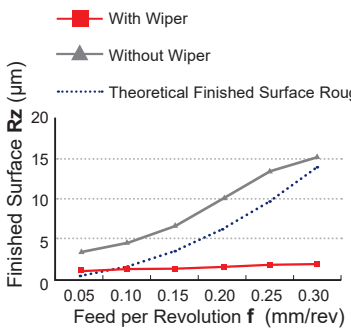


Examples of Low Rigidity:

- When overhang length is long due to boring
- When the workpiece material has a small diameter

■ Cutting Performance

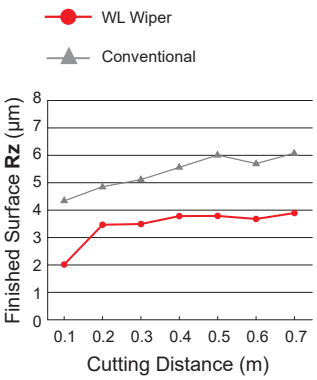
WL Wiper (External Turning)



<Cutting Conditions>

Workpiece Material	: Hardened Steel (60HRC)
Insert	: NP-CNGA120408
Machining Methods	: Continuous
Cutting Speed	: vc=120m/min
Depth of Cut	: ap=0.1mm
Cutting Mode	: Dry Cutting

WL Wiper (Boring)



<Cutting Conditions>

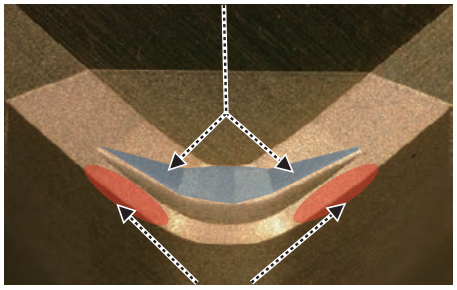
Workpiece Material	: SCr415 (60HRC)
Insert	: NP-CNGA120408FBWL2
Machining Methods	: Continuous
Cutting Speed	: vc=160m/min
Feed	: f=0.3mm/rev
Depth of Cut	: ap=0.1mm
Cutting Mode	: Dry Cutting

Stable surface finish is maintained even in unstable cutting.

Combination of BF Breaker and WS Wiper Insert

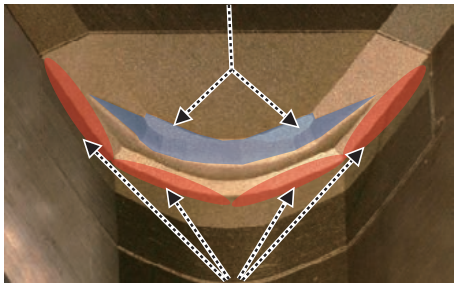
CNGM and DNGM types are now available with new inserts that combine a BF chip breaker with a WS wiper Insert.
(BC8210 : BF-○NGM○○○○○○TSWS2, BC8220 : BF-○NGM○○○○○○TAWS2)
It is effective for chip control and an improvement of finished surface roughness without worrying about the hand of the tool even when continuous external or internal turning and facing.

BF breaker



WL Wiper (No hand)
BF-CNGM120408TSWS2

BF breaker



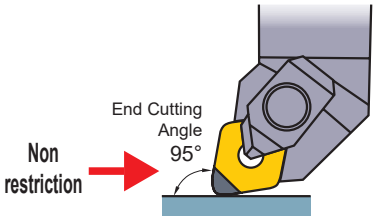
WL Wiper (No hand)
BF-DNGM150412TAWS2

■ Precautions when Using Wiper Inserts

When Using CNGM Type

No Restriction for Holders

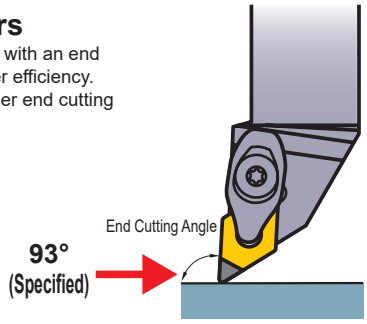
A standard holder can be used.
(*A double clamp, high rigidity tool is recommended.)



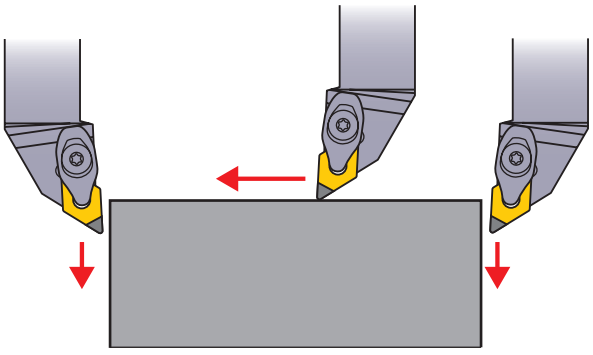
When Using DNGM Type

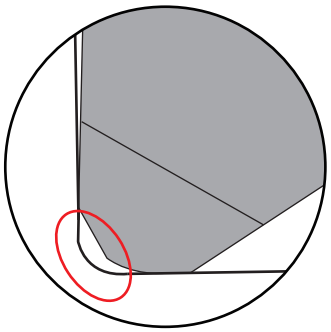
Restriction for Holders

Use a PDJN holder or DDJN holder with an end cutting angle of 93° to improve wiper efficiency.
There is no wiper efficiency with other end cutting angles (60°, 90°,107°, etc.).



Displays great wiper efficiency when machining the end face and outer diameter in both right-hand and left-hand machining.





*The DNGM type is not suitable for machining the R that connects the end face and the outer diameter because it will leave uncut parts.

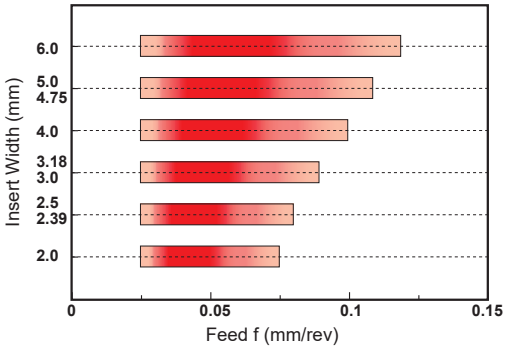
CBN GROOVING SERIES
(GY)

BC8110 coating for continuous machining of hardened steel has been added to GY inserts.

GY is a grooving tool series that achieves high rigidity with the "Tri-Lock System". (See page F004 for more details.)

BC8110 coating with excellent wear resistance has been added. Compared to conventional coating, it displays excellent wear resistance that achieves a longer tool life. A blade width of 6.0 has also been added to the BC8110 lineup.

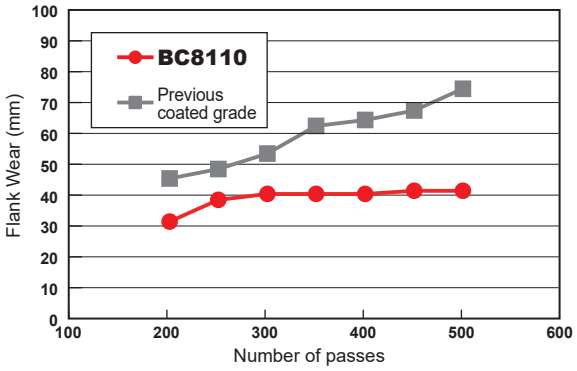
■ Recommended Cutting Conditions



Workpiece Material		Hardness	Grade	Cutting Speed vc (m/min)	Cutting Mode
H	Hardened Steel	35—65HRC	**BC8110**	100 (60—120)	Dry,Wet

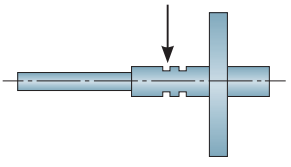
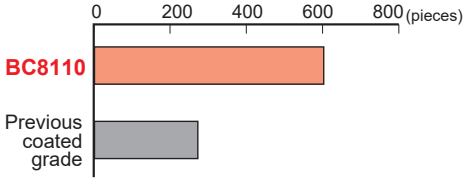
■ Cutting Performance

Tool life evaluation for the GY holder



<Cutting Conditions>
Insert : GY1G0200D020N-GFGS
Workpiece Material : SCr420 (60HRC)
Cutting Speed : vc=120 m/min
Feed : f=0.1 mm/rev
Depth of Cut : ap=0.3 mm
Cutting Mode : Dry Cutting

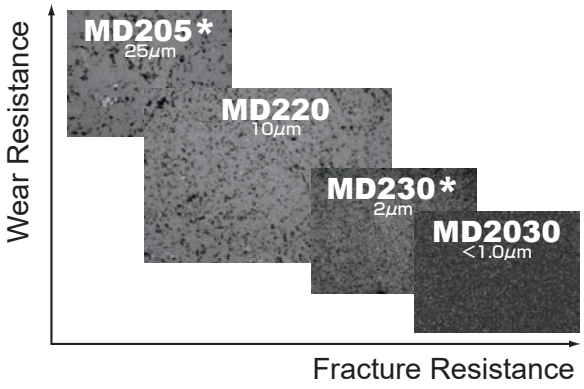
■ Application Example

Insert		**GY1G0300F020N-GFGS** (Grade : **BC8110**)
Workpiece Material		 SNCM230H (58—62HRC)
Component		Input shaft
Cutting Conditions	Cutting Speed vc (m/min)	130
Cutting Conditions	Feed f (mm/rev)	0.1
Result		 Tool life over twice as long as conventional products

INTRODUCTION OF PCD (SINTERED DIAMOND) GRADES

Suitable for materials such as aluminium alloys, non-ferrous metals, and fibre reinforced plastic.

Suitable for extreme high-speed finishing.



Grade	Features
MD205*	**For Continuous Cutting** Coarse grain diamond particles are sintered and wear resistance is excellent. Use when wear resistance with MD220 is insufficient.
MD220	**For General Machining** Sintered medium grain diamond particles. Wear resistance and fracture resistance are superbly balanced. Applicable for general finishing of non-ferrous metals, non-metal cutting, and similar machining.
MD230*	**For Interrupted Cutting** Fine grain diamond particles are used. Fracture resistance and cutting edge sharpness are excellent. Use when fracture and a high-quality finished surface are demanded with MD220.
MD2030	**For Heavy Interrupted Cutting** Strong sintering of ultra micro-grain PCD particles provides exceptional fracture resistance. Chipping during high-speed finish turning can be controlled.

*MD205 and MD230 are produced-to-order products.

■ SELECTION STANDARD

TURNING

Workpiece Material	Recommended Grade		Recommended Cutting Conditions		
	MD205	MD220	Cutting Speed vc (m/min)	Feed f (mm/rev)	Depth of Cut ap (mm)
Aluminium Alloy (Si ≤ 12%)		◎	800 (200—1200)	—0.2	—1.0
Aluminium Alloy (Si ≥13%)	◎	○	600 (200—1000)	—0.2	—1.0
Copper Alloy		◎	700 (200—1200)	—0.2	—1.0
Strengthened Plastic		◎	600 (100—1000)	—0.4	—1.0
Glass Fibre Reinforced Plastic		◎	500 (100—800)	—0.25	—1.0
Carbon	○	◎	400 (100—600)	—0.3	—1.0
Ceramics		○	50 (30—80)	—0.1	—1.0
Hard Rubber		◎	600 (300—800)	—0.15	—1.0
Wood Inorganic Board		◎	1300 (300—4000)	—0.4	—
Cemented Carbide	◎	○	15 (5—20)	—0.2	—0.5

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

■ NEW PETIT CUT INSERT SERIES

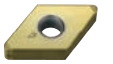
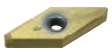
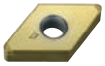
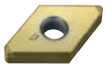
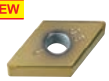
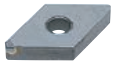
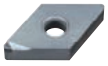
●**Economical** Low cost is achieved by reducing the area of the diamond sintered body. In addition, tool management is economical because regrinding is unnecessary.

●**With Breaker** Chip breaker formed directly on the PCD portion delivers superior chip control.

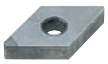
●Machining of small corner R is possible with the corner R0.05 lineup.

CLASSIFICATION

NEGATIVE INSERTS WITH HOLE

Product Name	Type	Tolerance	Breaker Name and Cross Section	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°
NEW PETIT CUT	Multi-Corner Type Double-Sided	G	Flat Top	NP-CNGA_○4  B022	NP-DNGA_○4  B026		NP-TNGA_○6  B032	NP-VNGA_○4  B035	NP-WNGA_○6  B037
	Multi-Corner Type Double-Sided With Wiper		Flat Top	NP-CNGA_○W○4  B022					
	Multi-Corner Type Single Sided		Flat Top	NP-CNGA_○2  B023	NP-DNGA_○2  B027	NP-SNGA_○2  B031	NP-TNGA_○3  B032	NP-VNGA_○2  B035	NP-WNGA_○3  B037
	Multi-Corner Type Single Sided With Wiper		Flat Top	NP-CNGA_○W○2  B024	NP-DNGA_○W○2J_R/L  B029				NP-WNGA_○W○3  B037
	Multi-Corner Type Single Sided With Breaker		BF	BF-CNGM_○2  B024	BF-DNGM_○2  B029				
	Multi-Corner Type Single Sided With Breaker With Wiper		BF	BF-CNGM_○WS2 NEW  B024	BF-DNGM_○WS2 NEW  B029				
	Multi-Corner Type Single Sided With Breaker		BM	BM-CNGM_○2  B024	BM-DNGM_○2  B029		BM-TNGM_○3  B033		
	Multi-Corner Type Single Sided With Breaker		BR	BR-CNGM_○2 NEW  B024	BR-DNGM_○2 NEW  B029				
	One-Corner Type Single Sided	M	Flat Top	NP-CNMA_○  B025	NP-DNMA_○  B030	NP-SNMA_○  B031	NP-TNMA_○  B033	NP-VNMA_○  B036	
	One-Corner Type Single Sided With Breaker		R/L-F	NP-CNMM_R/L-F  B055	NP-DNMM_R/L-F  B055	NP-SNMM_R/L-F  B056	NP-TNMM_R/L-F  B056	NP-VNMM_R/L-F  B057	

NEGATIVE INSERTS WITH HOLE

Product Name	Type	Tolerance	Breaker Name and Cross Section	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°
STANDARD	Multi-Corner Type Double-Sided (Solid CBN)	G	Flat Top	CNGA  B025		SNGA  B031	TNGA  B034		
	One-Corner Type Single Sided	M	Flat Top	CNMA  B025, B055					
	One-Corner Type Single Sided	G	Flat Top		DNGA  B030, B055	SNGA  B031, B056	TNGA  B033, B056	VNGA  B036, B057	

5° POSITIVE INSERTS WITH HOLE

Product Name	Type	Tolerance	Breaker Name and Cross Section	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°
NEW PETIT CUT	Multi-Corner Type	G	Flat Top					NP-VBGW_○2  B049	
	One-Corner Type With Breaker		R-F					NP-VBGT_R-F  B064	

CLASSIFICATION

7° POSITIVE INSERTS WITH HOLE

Product Name	Type	Tolerance	Breaker Name and Cross Section	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°
NEW PETIT CUT	Multi-Corner Type	G	Flat Top	NP-CCGW_○2 B040	NP-DCGW_○2 B044		NP-TCGW_○3 B046	NP-VCGW_○2 B050	
	Multi-Corner Type With Wiper	G	Flat Top	NP-CCGW_○W○2 B041					
	Multi-Corner Type With Breaker	G	BF	BF-CCGT_○2 B041	BF-DCGT_○2 B045				
	Multi-Corner Type With Breaker	G	BM	BM-CCGT_○2 B041	BM-DCGT_○2 B045				
	One-Corner Type With Breaker	M	Breaker	NP-CCMH B059					
	One-Corner Type	G	Flat Top	NP-CCGW_○ B041	NP-DCGW_○ B045				
	One-Corner Type	M	Flat Top						NP-WCMW_○ B051
	One-Corner Type	M	Flat Top	NP-CCMW B059					
	One-Corner Type With Breaker	M	R/L-F		NP-DCMT_R/L-F B060				
	One-Corner Type With Breaker	G	R-F					NP-VCGT_R-F B064	
STANDARD	One-Corner Type	M / G	Flat Top	CCMW B042, B059	DCMW B045, B060		TCMW TCGW B046, B061	NEW VCGW B064	WCMW B065

11° POSITIVE INSERTS WITH HOLE

Product Name	Type	Tolerance	Breaker Name and Cross Section	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°
NEW PETIT CUT	Multi-Corner Type	G	Flat Top	NP-CPGB_○2  B043			NP-TPGB_○3  B047		
	One-Corner Type With Breaker	M	Breaker	NP-CPMH  B059					
	One-Corner Type	G	Flat Top				NP-TPGX_○  B048		
	One-Corner Type With Breaker	M	R/L-F				NP-TPMX_R/L-F  B062		
	One-Corner Type With Breaker		R/L-F				NP-TPMH_R/L-F  B062		
STANDARD	One-Corner Type With Breaker	G	Breaker	CPGT  B059					WPGT  B065
	One-Corner Type		Flat Top			SPGX  B060	TPGX  B048, B063		
	One-Corner Type With Breaker		R/L-F				TPGT/V_R/L-F  B062, B063		

CLASSIFICATION

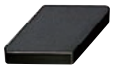
15° POSITIVE INSERTS WITH HOLE

Type	Tolerance	Breaker Name and Cross Section	Rhombic 35° 
One-Corner Type (For Aluminium With Breaker)	G	R/L 	VDGX_R/L-F  ➲ B067

20° POSITIVE INSERTS WITH HOLE

Type	Tolerance	Breaker Name and Cross Section	Rhombic 55° 	Triangular 60° 
One-Corner Type (For Aluminium With Breaker)	G	R/L 		TEGX_R/L  ➲ B066
One-Corner Type (For Aluminium With Breaker)		R/L-F 	DEGX_R/L-F  ➲ B066	
One-Corner Type (For Aluminium)		Flat Top 		TEGX  ➲ B066

NEGATIVE INSERTS WITHOUT HOLE

Type	Tolerance	Breaker Name and Cross Section	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Round
One-Corner Type Single Sided	G	Flat Top			SNGN  B039, B058	TNGN  B039	
Multi-Corner Type Double-Sided (Solid CBN)	G	Flat Top	CNGN  B038	DNGN  B038	SNGN  B039	TNGN  B039	RNGN  B038

5° POSITIVE INSERTS WITHOUT HOLE

Type	Tolerance	Breaker Name and Cross Section	Triangular 60°	
Multi-Corner Type	G	Flat Top	TBGN  B053	

SPECIAL PURPOSE INSERTS

Tool Holder Type	Tolerance	Inserts
GY Type	G	GY_GFGS  B054

11° POSITIVE INSERTS WITHOUT HOLE

Type	Tolerance	Breaker Name and Cross Section	Square 90°	Triangular 60°
Multi-Corner Type	G	Flat Top	NP-SPGN_○2 NEW  B052	
One-Corner Type	G	Flat Top	SPGN  B052, B068	TPGN  B053, B068

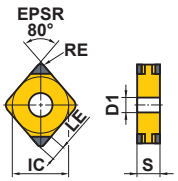
80° CN TYPE INSERTS WITH HOLE

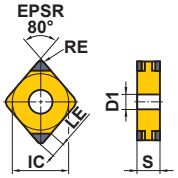
Workpiece Material			BC8210 NEW	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110 NEW	MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140
	H	Hardened Materials	●	◐	●	●	◐	✲		●	◐	✲				
	K	Cast Iron							●				◐	●	◐	✲
	S	Heat Resistant Alloy, Titanium Alloy													●	
		Sintered Alloy											◐			

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✲ : Unstable Cutting

Honing (Last letter of order number) : Refer to page B009.

Shape	Order Number	Coated CBN							CBN						Solid CBN	Dimensions (mm)					Geometry
		BC8210 NEW	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110 NEW	MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140	IC	S	RE	LE	D1	
NEW PETIT CUT	NP-CNGA120404FS4	●		●	▲	▲			●							12.7	4.76	0.4	1.8	5.16	
	NP-CNGA120408FS4	●		●	▲	▲			●							12.7	4.76	0.8	2.0	5.16	
	NP-CNGA120412FS4	●		●	▲	▲			●							12.7	4.76	1.2	2.2	5.16	
	NP-CNGA120404GS4	●		●	▲											12.7	4.76	0.4	1.8	5.16	
	NP-CNGA120408GS4	●		●	▲											12.7	4.76	0.8	2.0	5.16	
	NP-CNGA120412GS4	●		●	▲											12.7	4.76	1.2	2.2	5.16	
	NP-CNGA120404GA4		●			▲	●			●						12.7	4.76	0.4	1.8	5.16	
	NP-CNGA120408GA4		●			▲	●			●						12.7	4.76	0.8	2.0	5.16	
	NP-CNGA120412GA4		●			▲	●			●						12.7	4.76	1.2	2.2	5.16	
	NP-CNGA120404GH4	●	●			▲	▲	●								12.7	4.76	0.4	1.8	5.16	
	NP-CNGA120408GH4	●	●			▲	▲	●								12.7	4.76	0.8	2.0	5.16	
	NP-CNGA120412GH4	●	●			▲	▲	●								12.7	4.76	1.2	2.2	5.16	
	NEW NP-CNGA120404VA4		●													12.7	4.76	0.4	1.8	5.16	
	NEW NP-CNGA120408VA4		●													12.7	4.76	0.8	2.0	5.16	
	NEW NP-CNGA120412VA4		●													12.7	4.76	1.2	2.2	5.16	
	NP-CNGA120404TS4	●			▲											12.7	4.76	0.4	1.8	5.16	
	NP-CNGA120408TS4	●			▲											12.7	4.76	0.8	2.0	5.16	
	NP-CNGA120412TS4	●			▲											12.7	4.76	1.2	2.2	5.16	
	NP-CNGA120404TA4		●			▲	●			●	●					12.7	4.76	0.4	1.8	5.16	
	NP-CNGA120408TA4		●			▲	●			●	●					12.7	4.76	0.8	2.0	5.16	
	NP-CNGA120412TA4		●			▲	●			●	●					12.7	4.76	1.2	2.2	5.16	
	NP-CNGA120404TH4					▲	●				●					12.7	4.76	0.4	1.8	5.16	
	NP-CNGA120408TH4		●			▲	●				●					12.7	4.76	0.8	2.0	5.16	
	NP-CNGA120412TH4		●			▲	●				●					12.7	4.76	1.2	2.2	5.16	
NEW PETIT CUT (With Wiper) *	NP-CNGA120404FSWS4	●		●	▲	▲			●							12.7	4.76	0.4	1.8	5.16	
	NP-CNGA120408FSWS4	●		●	▲	▲			●							12.7	4.76	0.8	2.0	5.16	
	NP-CNGA120412FSWS4	●		●	▲	▲			●							12.7	4.76	1.2	2.2	5.16	
	NP-CNGA120404GSWS4	●		●	▲											12.7	4.76	0.4	1.8	5.16	
	NP-CNGA120408GSWS4	●		●	▲											12.7	4.76	0.8	2.0	5.16	
	NP-CNGA120412GSWS4	●		●	▲											12.7	4.76	1.2	2.2	5.16	
	NP-CNGA120404GAWS4		●			▲	●			●						12.7	4.76	0.4	1.8	5.16	
	NP-CNGA120408GAWS4		●			▲	●			●						12.7	4.76	0.8	2.0	5.16	
	NP-CNGA120412GAWS4		●			▲	●			●						12.7	4.76	1.2	2.2	5.16	





* Please refer to B012 before using the wiper insert.

● = NEW

● : Inventory maintained in Japan. ▲ : Inventory maintained in Japan. To be replaced by new products.
(Contains one insert per case.)

Workpiece Material			Coated CBN							CBN						Solid CBN	Dimensions (mm)					Geometry
			NEW						NEW													
Shape		Order Number	BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140	IC	S	RE	LE	D1	
	H	Hardened Materials	●	◐	●	●	◐	✱		●	◐	✱										
	K	Cast Iron							●				◐	●	◐	✱						
	S	Heat Resistant Alloy, Titanium Alloy													●							
		Sintered Alloy											◐									
NEW PETIT CUT		NP-CNGA120402FS2	●			▲				●							12.7	4.76	0.2	1.7	5.16	
		NP-CNGA120404FS2	●		●	▲	▲		●	●			●	▲			12.7	4.76	0.4	1.8	5.16	
		NP-CNGA120408FS2	●		●	▲	▲		●	●			●	▲			12.7	4.76	0.8	2.0	5.16	
		NP-CNGA120412FS2	●		●	▲	▲		●	●			●	▲			12.7	4.76	1.2	2.2	5.16	
		NP-CNGA120402GS2	●			▲											12.7	4.76	0.2	1.7	5.16	
		NP-CNGA120404GS2	●		●	▲			●				●	▲	▲		12.7	4.76	0.4	1.8	5.16	
		NP-CNGA120408GS2	●		●	▲			●				●	▲	▲		12.7	4.76	0.8	2.0	5.16	
		NP-CNGA120412GS2	●		●	▲			●				●	▲	▲		12.7	4.76	1.2	2.2	5.16	
		NP-CNGA120402GA2		●			▲				●						12.7	4.76	0.2	1.7	5.16	
		NP-CNGA120404GA2		●			▲	●			●						12.7	4.76	0.4	1.8	5.16	
		NP-CNGA120408GA2		●			▲	●			●						12.7	4.76	0.8	2.0	5.16	
		NP-CNGA120412GA2		●			▲	●			●						12.7	4.76	1.2	2.2	5.16	
		NP-CNGA120404GH2	●	●		▲	▲	●									12.7	4.76	0.4	1.8	5.16	
		NP-CNGA120408GH2	●	●		▲	▲	●									12.7	4.76	0.8	2.0	5.16	
		NP-CNGA120412GH2	●	●		▲	▲	●									12.7	4.76	1.2	2.2	5.16	EPSR 80° RE D1 IC S
	NEW	NP-CNGA120404VA2		●													12.7	4.76	0.4	1.8	5.16	
	NEW	NP-CNGA120408VA2		●													12.7	4.76	0.8	2.0	5.16	
	NEW	NP-CNGA120412VA2		●													12.7	4.76	1.2	2.2	5.16	
		NP-CNGA120404TS2	●			▲							●				12.7	4.76	0.4	1.8	5.16	
		NP-CNGA120408TS2	●			▲							●				12.7	4.76	0.8	2.0	5.16	
		NP-CNGA120412TS2	●			▲							●				12.7	4.76	1.2	2.2	5.16	
		NP-CNGA120404TA2		●			▲	●			●	●			▲		12.7	4.76	0.4	1.8	5.16	
		NP-CNGA120408TA2		●			▲	●			●	●			▲		12.7	4.76	0.8	2.0	5.16	
		NP-CNGA120412TA2		●			▲	●			●	●			▲		12.7	4.76	1.2	2.2	5.16	
		NP-CNGA120404TH2					▲	●				●					12.7	4.76	0.4	1.8	5.16	
		NP-CNGA120408TH2		●			▲	●				●					12.7	4.76	0.8	2.0	5.16	
		NP-CNGA120412TH2		●			▲	●				●					12.7	4.76	1.2	2.2	5.16	
		NP-CNGA120404SF2											●				12.7	4.76	0.4	1.8	5.16	
		NP-CNGA120408SF2											●				12.7	4.76	0.8	2.0	5.16	
		NP-CNGA120412SF2											●				12.7	4.76	1.2	2.2	5.16	
		NP-CNGA120404SE2											●				12.7	4.76	0.4	1.8	5.16	
		NP-CNGA120408SE2											●				12.7	4.76	0.8	2.0	5.16	
		NP-CNGA120412SE2											●				12.7	4.76	1.2	2.2	5.16	

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✱ : Unstable Cutting

Honing (Last letter of order number) : Refer to page B009.

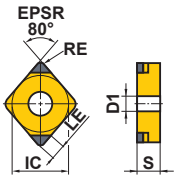
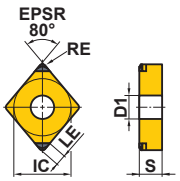
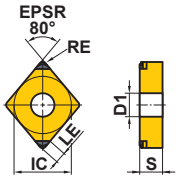
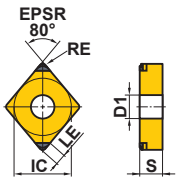
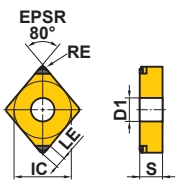
● = NEW

80° CN TYPE INSERTS WITH HOLE

Workpiece Material			BC8210 NEW	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110 NEW	MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140
	H	Hardened Materials	●	◐	●	●	◐	✲		●	◐	✲				
	K	Cast Iron							●				◐	●	◐	✲
	S	Heat Resistant Alloy, Titanium Alloy													●	
		Sintered Alloy											◐			

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✲ : Unstable Cutting

Honing (Last letter of order number) : Refer to page B009.

Shape	Order Number	Coated CBN							CBN						Solid CBN	Dimensions (mm)					Geometry
		BC8210 NEW	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110 NEW	MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140	IC	S	RE	LE	D1	
NEW PETIT CUT (With Wiper) * 	NP-CNGA120404FSWS2	●		●	▲	▲			●							12.7	4.76	0.4	1.8	5.16	
	NP-CNGA120408FSWS2	●		●	▲	▲			●							12.7	4.76	0.8	2.0	5.16	
	NP-CNGA120412FSWS2	●		●	▲	▲			●							12.7	4.76	1.2	2.2	5.16	
	NP-CNGA120404FBWL2			●	▲	▲			●							12.7	4.76	0.4	1.8	5.16	
	NP-CNGA120408FBWL2			●	▲	▲			●							12.7	4.76	0.8	2.0	5.16	
	NP-CNGA120412FBWL2			●	▲	▲			●							12.7	4.76	1.2	2.2	5.16	
	NP-CNGA120404GSWS2	●		●	▲											12.7	4.76	0.4	1.8	5.16	
	NP-CNGA120408GSWS2	●		●	▲											12.7	4.76	0.8	2.0	5.16	
	NP-CNGA120412GSWS2	●		●	▲											12.7	4.76	1.2	2.2	5.16	
	NP-CNGA120404GAWS2		●			▲	●			●						12.7	4.76	0.4	1.8	5.16	
	NP-CNGA120408GAWS2		●			▲	●			●						12.7	4.76	0.8	2.0	5.16	
	NP-CNGA120412GAWS2		●			▲	●			●						12.7	4.76	1.2	2.2	5.16	
	NP-CNGA120404GBWL2			●	▲	▲				●						12.7	4.76	0.4	1.8	5.16	
	NP-CNGA120408GBWL2			●	▲	▲				●						12.7	4.76	0.8	2.0	5.16	
	NP-CNGA120412GBWL2			●	▲	▲				●						12.7	4.76	1.2	2.2	5.16	
NEW PETIT CUT  (With Breaker)	BF-CNGM120404TS2	●			▲											12.7	4.76	0.4	1.8	5.16	
	BF-CNGM120408TS2	●			▲											12.7	4.76	0.8	2.0	5.16	
	BF-CNGM120412TS2	●			▲											12.7	4.76	1.2	2.2	5.16	
NEW PETIT CUT (With Wiper) * NEW  (With Breaker)	BF-CNGM120408TSWS2	●														12.7	4.76	0.8	2.0	5.16	
	BF-CNGM120412TSWS2	●														12.7	4.76	1.2	2.2	5.16	
	BF-CNGM120408TAWS2		●													12.7	4.76	0.8	2.0	5.16	
	BF-CNGM120412TAWS2		●													12.7	4.76	1.2	2.2	5.16	
NEW PETIT CUT  (With Breaker)	BM-CNGM120404TA2		●			▲										12.7	4.76	0.4	1.8	5.16	
	BM-CNGM120408TA2		●			▲										12.7	4.76	0.8	2.0	5.16	
	BM-CNGM120412TA2		●			▲										12.7	4.76	1.2	2.2	5.16	
NEW PETIT CUT NEW  (With Breaker)	BR-CNGM120404TA2		●													12.7	4.76	0.4	1.8	5.16	
	BR-CNGM120408TA2		●													12.7	4.76	0.8	2.0	5.16	
	BR-CNGM120412TA2		●													12.7	4.76	1.2	2.2	5.16	

* Please refer to B012 before using the wiper insert.

● = NEW

● : Inventory maintained in Japan. ▲ : Inventory maintained in Japan. To be replaced by new products.
(Contains one insert per case.)

Workpiece Material			Coated CBN							CBN						Solid CBN	Dimensions (mm)					Geometry
			NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140	IC	S	RE	LE	D1	
	H	Hardened Materials	●	◐	●	●	◐	✠		●	◐	✠										
	K	Cast Iron							●				◐	●	◐	✠						
	S	Heat Resistant Alloy, Titanium Alloy													●							
		Sintered Alloy											◐									
NEW PETIT CUT		NP-CNMA120404GS												▲	▲		12.7	4.76	0.4	1.8	5.16	EPSR 80° LE RE IC D1 S
		NP-CNMA120408GS												▲	▲		12.7	4.76	0.8	2.0	5.16	
		NP-CNMA120412GS												▲	▲		12.7	4.76	1.2	2.2	5.16	
		NP-CNMA120404F												▲			12.7	4.76	0.4	1.8	5.16	
		NP-CNMA120408F												▲			12.7	4.76	0.8	2.0	5.16	
		NP-CNMA120412F												▲			12.7	4.76	1.2	2.2	5.16	
		NP-CNMA120404T													▲		12.7	4.76	0.4	1.8	5.16	
		NP-CNMA120408T													▲		12.7	4.76	0.8	2.0	5.16	
		NP-CNMA120412T													▲		12.7	4.76	1.2	2.2	5.16	
		CNMA120404												▲	▲		12.7	4.76	0.4	3.6	5.16	EPSR 80° LE RE IC D1 S
		CNMA120408												▲	▲		12.7	4.76	0.8	3.6	5.16	
		CNMA120412												▲	▲		12.7	4.76	1.2	3.6	5.16	
		CNGA120408														●	12.7	4.76	0.8	—	5.16	EPSR 80° RE IC D1 S
		CNGA120412														●	12.7	4.76	1.2	—	5.16	

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✠ : Unstable Cutting

Honing (Last letter of order number) : Refer to page B009.

● = NEW

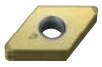
55° DN TYPE INSERTS WITH HOLE

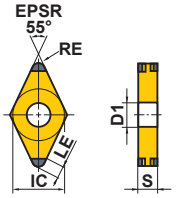
Workpiece Material			BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140
	H	Hardened Materials	●	◐	●	●	◐	✲		●	◐	✲				
	K	Cast Iron							●				◐	●	◐	✲
	S	Heat Resistant Alloy, Titanium Alloy													●	
		Sintered Alloy											◐			

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✲ : Unstable Cutting

Honing (Last letter of order number) : Refer to page B009.

Shape	Order Number	Coated CBN							CBN						Solid CBN	Dimensions (mm)					Geometry
		NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140	IC	S	RE	LE	D1	
NEW PETIT CUT	NP-DNGA150404FS4	●		●	▲	▲			●							12.7	4.76	0.4	2.1	5.16	
	NP-DNGA150408FS4	●		●	▲	▲			●							12.7	4.76	0.8	2.0	5.16	
	NP-DNGA150412FS4	●		●	▲	▲			●							12.7	4.76	1.2	1.8	5.16	
	NP-DNGA150604FS4	●		●	▲				●							12.7	6.35	0.4	2.1	5.16	
	NP-DNGA150608FS4	●		●	▲				●							12.7	6.35	0.8	2.0	5.16	
	NP-DNGA150612FS4	●		●	▲				●							12.7	6.35	1.2	1.8	5.16	
	NP-DNGA150404GS4	●		●	▲											12.7	4.76	0.4	2.1	5.16	
	NP-DNGA150408GS4	●		●	▲											12.7	4.76	0.8	2.0	5.16	
	NP-DNGA150412GS4	●		●	▲											12.7	4.76	1.2	1.8	5.16	
	NP-DNGA150604GS4	●		●	▲											12.7	6.35	0.4	2.1	5.16	
	NP-DNGA150608GS4	●		●	▲											12.7	6.35	0.8	2.0	5.16	
	NP-DNGA150612GS4	●		●	▲											12.7	6.35	1.2	1.8	5.16	
	NP-DNGA150404GA4		●			▲	●			●						12.7	4.76	0.4	2.1	5.16	
	NP-DNGA150408GA4		●			▲	●			●						12.7	4.76	0.8	2.0	5.16	
	NP-DNGA150412GA4		●			▲	●			●						12.7	4.76	1.2	1.8	5.16	
	NP-DNGA150604GA4		●			▲	●			●						12.7	6.35	0.4	2.1	5.16	
	NP-DNGA150608GA4		●			▲	●			●						12.7	6.35	0.8	2.0	5.16	
	NP-DNGA150612GA4		●			▲	●			●						12.7	6.35	1.2	1.8	5.16	
	NP-DNGA150404GH4	●	●		▲	▲	●									12.7	4.76	0.4	2.1	5.16	
	NP-DNGA150408GH4	●	●		▲	▲	●									12.7	4.76	0.8	2.0	5.16	
	NP-DNGA150412GH4	●	●		▲	▲	●									12.7	4.76	1.2	1.8	5.16	
	NP-DNGA150604GH4	●	●		▲	▲	●									12.7	6.35	0.4	2.1	5.16	
	NP-DNGA150608GH4	●	●		▲	▲	●									12.7	6.35	0.8	2.0	5.16	
	NP-DNGA150612GH4	●	●		▲	▲	●									12.7	6.35	1.2	1.8	5.16	
	NEW NP-DNGA150404VA4		●													12.7	4.76	0.4	2.1	5.16	
	NEW NP-DNGA150408VA4		●													12.7	4.76	0.8	2.0	5.16	
	NEW NP-DNGA150412VA4		●													12.7	4.76	1.2	1.8	5.16	
	NEW NP-DNGA150604VA4		●													12.7	6.35	0.4	2.1	5.16	
	NEW NP-DNGA150608VA4		●													12.7	6.35	0.8	2.0	5.16	
	NEW NP-DNGA150612VA4		●													12.7	6.35	1.2	1.8	5.16	
	NP-DNGA150404TS4	●			▲											12.7	4.76	0.4	2.1	5.16	
	NP-DNGA150408TS4	●			▲											12.7	4.76	0.8	2.0	5.16	
	NP-DNGA150412TS4	●			▲											12.7	4.76	1.2	1.8	5.16	
	NP-DNGA150604TS4	●			▲											12.7	6.35	0.4	2.1	5.16	
	NP-DNGA150608TS4	●			▲											12.7	6.35	0.8	2.0	5.16	
	NP-DNGA150612TS4	●			▲											12.7	6.35	1.2	1.8	5.16	
	NP-DNGA150404TA4		●			▲	●			●	●					12.7	4.76	0.4	2.1	5.16	
	NP-DNGA150408TA4		●			▲	●			●	●					12.7	4.76	0.8	2.0	5.16	
	NP-DNGA150412TA4		●			▲	●			●	●					12.7	4.76	1.2	1.8	5.16	





● = NEW

● : Inventory maintained in Japan. ▲ : Inventory maintained in Japan. To be replaced by new products.
(Contains one insert per case.)

Workpiece Material			Coated CBN							CBN						Solid CBN	Dimensions (mm)					Geometry
			NEW						NEW													
Shape		Order Number	BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140	IC	S	RE	LE	D1	
	H	Hardened Materials	●	◐	●	●	◐	✱		●	◐	✱										
	K	Cast Iron							●				◐	●	◐	✱						
	S	Heat Resistant Alloy, Titanium Alloy													●							
		Sintered Alloy											◐									
NEW PETIT CUT		NP-DNGA150604TA4		●			▲	●			●						12.7	6.35	0.4	2.1	5.16	
		NP-DNGA150608TA4		●			▲	●			●						12.7	6.35	0.8	2.0	5.16	
		NP-DNGA150612TA4		●			▲	●			●						12.7	6.35	1.2	1.8	5.16	
		NP-DNGA150404TH4					▲	●				●					12.7	4.76	0.4	2.1	5.16	
		NP-DNGA150408TH4		●			▲	●				●					12.7	4.76	0.8	2.0	5.16	
		NP-DNGA150412TH4		●			▲	●				●					12.7	4.76	1.2	1.8	5.16	
		NP-DNGA150604TH4					▲	●									12.7	6.35	0.4	2.1	5.16	
		NP-DNGA150608TH4		●			▲	●									12.7	6.35	0.8	2.0	5.16	
		NP-DNGA150612TH4		●			▲	●									12.7	6.35	1.2	1.8	5.16	
NEW PETIT CUT		NP-DNGA150402FS2	●			▲				●							12.7	4.76	0.2	2.2	5.16	
		NP-DNGA150404FS2	●		●	▲	▲		●	●			●				12.7	4.76	0.4	2.1	5.16	
		NP-DNGA150408FS2	●		●	▲	▲		●	●			●				12.7	4.76	0.8	2.0	5.16	
		NP-DNGA150412FS2	●		●	▲	▲			●			●				12.7	4.76	1.2	1.8	5.16	
		NP-DNGA150604FS2	●		●	▲	▲		●	●			●				12.7	6.35	0.4	2.1	5.16	
		NP-DNGA150608FS2	●		●	▲	▲		●	●			●				12.7	6.35	0.8	2.0	5.16	
		NP-DNGA150612FS2	●		●	▲	▲			●			●				12.7	6.35	1.2	1.8	5.16	
		NP-DNGA150402GS2	●			▲											12.7	4.76	0.2	2.2	5.16	
	*	NP-DNGA150404GS2	●		●	▲			●				●				12.7	4.76	0.4	2.1	5.16	
	*	NP-DNGA150404GS2												▲	▲		12.7	4.76	0.4	1.5	5.16	
	*	NP-DNGA150408GS2	●		●	▲			●				●				12.7	4.76	0.8	2.0	5.16	
	*	NP-DNGA150408GS2												▲	▲		12.7	4.76	0.8	1.7	5.16	
		NP-DNGA150412GS2	●		●	▲							●	▲	▲		12.7	4.76	1.2	1.8	5.16	
		NP-DNGA150604GS2	●		●	▲							●				12.7	6.35	0.4	2.1	5.16	
		NP-DNGA150608GS2	●		●	▲			●				●				12.7	6.35	0.8	2.0	5.16	
		NP-DNGA150612GS2	●		●	▲							●				12.7	6.35	1.2	1.8	5.16	
		NP-DNGA110408GA2		●			▲	●			●						9.525	4.76	0.8	2.0	3.81	
		NP-DNGA150402GA2		●			▲										12.7	4.76	0.2	2.2	5.16	
		NP-DNGA150404GA2		●			▲	●			●						12.7	4.76	0.4	2.1	5.16	
		NP-DNGA150408GA2		●			▲	●			●						12.7	4.76	0.8	2.0	5.16	
		NP-DNGA150412GA2		●			▲	●			●						12.7	4.76	1.2	1.8	5.16	
		NP-DNGA150602GA2					▲										12.7	6.35	0.2	2.2	5.16	
		NP-DNGA150604GA2		●			▲	●			●						12.7	6.35	0.4	2.1	5.16	
		NP-DNGA150608GA2		●			▲	●			●						12.7	6.35	0.8	2.0	5.16	
		NP-DNGA150612GA2		●			▲	●			●						12.7	6.35	1.2	1.8	5.16	
		NP-DNGA150404GH2	●	●		▲	▲	●									12.7	4.76	0.4	2.1	5.16	
		NP-DNGA150408GH2	●	●		▲	▲	●									12.7	4.76	0.8	2.0	5.16	
		NP-DNGA150412GH2	●	●		▲	▲	●									12.7	4.76	1.2	1.8	5.16	
		NP-DNGA150604GH2	●	●		▲	▲	●									12.7	6.35	0.4	2.1	5.16	
		NP-DNGA150608GH2	●	●		▲	▲	●									12.7	6.35	0.8	2.0	5.16	
		NP-DNGA150612GH2	●	●		▲	▲	●									12.7	6.35	1.2	1.8	5.16	

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✱ : Unstable Cutting

Honing (Last letter of order number) : Refer to page B009.

EPSR 55° RE LE IC D1 S

✱ Please note that LE dimensions vary by grade.

● = NEW

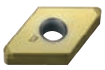
55° DN TYPE INSERTS WITH HOLE

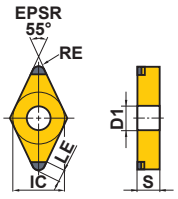
Workpiece Material			BC8210 NEW	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110 NEW	MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140
	H	Hardened Materials	●	◐	●	●	◐	✲		●	◐	✲				
	K	Cast Iron							●				◐	●	◐	✲
	S	Heat Resistant Alloy, Titanium Alloy													●	
		Sintered Alloy											◐			

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✲ : Unstable Cutting

Honing (Last letter of order number) : Refer to page B009.

Shape	Order Number	Coated CBN							CBN						Solid CBN	Dimensions (mm)					Geometry
		NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140	IC	S	RE	LE	D1	
NEW PETIT CUT	NEW NP-DNGA150404VA2		●													12.7	4.76	0.4	2.1	5.16	
	NEW NP-DNGA150408VA2		●													12.7	4.76	0.8	2.0	5.16	
	NEW NP-DNGA150412VA2		●													12.7	4.76	1.2	1.8	5.16	
	NEW NP-DNGA150604VA2		●													12.7	6.35	0.4	2.1	5.16	
	NEW NP-DNGA150608VA2		●													12.7	6.35	0.8	2.0	5.16	
	NEW NP-DNGA150612VA2		●													12.7	6.35	1.2	1.8	5.16	
	NP-DNGA150404TS2	●			▲							●				12.7	4.76	0.4	2.1	5.16	
	NP-DNGA150408TS2	●			▲							●				12.7	4.76	0.8	2.0	5.16	
	NP-DNGA150412TS2	●			▲							●				12.7	4.76	1.2	1.8	5.16	
	NP-DNGA150604TS2	●			▲							●				12.7	6.35	0.4	2.1	5.16	
	NP-DNGA150608TS2	●			▲							●				12.7	6.35	0.8	2.0	5.16	
	NP-DNGA150612TS2	●			▲							●				12.7	6.35	1.2	1.8	5.16	
	NP-DNGA150404TA2		●			▲	●			●	●					12.7	4.76	0.4	2.1	5.16	
	NP-DNGA150408TA2		●			▲	●			●	●					12.7	4.76	0.8	2.0	5.16	
	NP-DNGA150412TA2		●			▲	●			●	●					12.7	4.76	1.2	1.8	5.16	
	NP-DNGA150604TA2		●			▲	●			●						12.7	6.35	0.4	2.1	5.16	
	NP-DNGA150608TA2		●			▲	●			●						12.7	6.35	0.8	2.0	5.16	
	NP-DNGA150612TA2		●			▲	●			●						12.7	6.35	1.2	1.8	5.16	
	NP-DNGA150404TH2					▲	●				●					12.7	4.76	0.4	2.1	5.16	
	NP-DNGA150408TH2		●			▲	●				●					12.7	4.76	0.8	2.0	5.16	
	NP-DNGA150412TH2		●			▲	●				●					12.7	4.76	1.2	1.8	5.16	
	NP-DNGA150604TH2					▲	●									12.7	6.35	0.4	2.1	5.16	
	NP-DNGA150608TH2		●			▲	●									12.7	6.35	0.8	2.0	5.16	
	NP-DNGA150612TH2		●			▲	●									12.7	6.35	1.2	1.8	5.16	
	NP-DNGA150404SF2											●				12.7	4.76	0.4	2.1	5.16	
	NP-DNGA150408SF2											●				12.7	4.76	0.8	2.0	5.16	
	NP-DNGA150412SF2											●				12.7	4.76	1.2	1.8	5.16	
	NP-DNGA150604SF2											●				12.7	6.35	0.4	2.1	5.16	
	NP-DNGA150608SF2											●				12.7	6.35	0.8	2.0	5.16	
	NP-DNGA150612SF2											●				12.7	6.35	1.2	1.8	5.16	
	NP-DNGA150404SE2											●				12.7	4.76	0.4	2.1	5.16	
	NP-DNGA150408SE2											●				12.7	4.76	0.8	2.0	5.16	
	NP-DNGA150412SE2											●				12.7	4.76	1.2	1.8	5.16	
	NP-DNGA150604SE2											●				12.7	6.35	0.4	2.1	5.16	
	NP-DNGA150608SE2											●				12.7	6.35	0.8	2.0	5.16	
	NP-DNGA150612SE2											●				12.7	6.35	1.2	1.8	5.16	





● = NEW

● : Inventory maintained in Japan. ▲ : Inventory maintained in Japan. To be replaced by new products.
(Contains one insert per case.)

Workpiece Material			Coated CBN							CBN						Solid CBN	Dimensions (mm)					Geometry
			NEW						NEW													
Shape		Order Number	BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140	IC	S	RE	LE	D1	
	H	Hardened Materials	●	◐	●	●	◐	✻		●	◐	✻										
	K	Cast Iron							●				◐	●	◐	✻						
	S	Heat Resistant Alloy, Titanium Alloy													●							
		Sintered Alloy											◐									
NEW PETIT CUT (With Wiper) *		NP-DNGA150404GSWS2JR	●														12.7	4.76	0.4	1.8	5.16	EPSR 55° RE LE IC D1 S
		NP-DNGA150404GSWS2JL	●														12.7	4.76	0.4	1.8	5.16	
		NP-DNGA150408GSWS2JR	●														12.7	4.76	0.8	1.7	5.16	
		NP-DNGA150408GSWS2JL	●														12.7	4.76	0.8	1.7	5.16	
		NP-DNGA150604GSWS2JR	●														12.7	6.35	0.4	1.8	5.16	
		NP-DNGA150604GSWS2JL	●														12.7	6.35	0.4	1.8	5.16	
		NP-DNGA150608GSWS2JR	●														12.7	6.35	0.8	1.7	5.16	
		NP-DNGA150608GSWS2JL	●														12.7	6.35	0.8	1.7	5.16	
		NP-DNGA150404GAWS2JR		●		▲				●							12.7	4.76	0.4	1.8	5.16	
		NP-DNGA150404GAWS2JL		●		▲				●							12.7	4.76	0.4	1.8	5.16	
		NP-DNGA150408GAWS2JR		●		▲				●							12.7	4.76	0.8	1.7	5.16	
		NP-DNGA150408GAWS2JL		●		▲				●							12.7	4.76	0.8	1.7	5.16	
		NP-DNGA150604GAWS2JR		●		▲				●							12.7	6.35	0.4	1.8	5.16	
		NP-DNGA150604GAWS2JL		●		▲				●							12.7	6.35	0.4	1.8	5.16	
		NP-DNGA150608GAWS2JR		●		▲				●							12.7	6.35	0.8	1.7	5.16	
		NP-DNGA150608GAWS2JL		●		▲				●							12.7	6.35	0.8	1.7	5.16	Right hand insert shown.
NEW PETIT CUT		BF-DNGM150404TS2	●			▲											12.7	4.76	0.4	2.1	5.16	EPSR 55° RE LE IC D1 S
		BF-DNGM150408TS2	●			▲											12.7	4.76	0.8	2.0	5.16	
		BF-DNGM150412TS2	●			▲											12.7	4.76	1.2	1.8	5.16	
(With Breaker)																						
NEW PETIT CUT (With Wiper) *		BF-DNGM150408TSWS2	●														12.7	4.76	0.8	2.4	5.16	EPSR 55° RE LE IC D1 S
		BF-DNGM150412TSWS2	●														12.7	4.76	1.2	2.6	5.16	
NEW		BF-DNGM150408TAWS2		●													12.7	4.76	0.8	2.4	5.16	
		BF-DNGM150412TAWS2		●													12.7	4.76	1.2	2.6	5.16	
(With Breaker)																						
NEW PETIT CUT		BM-DNGM150404TA2		●			▲										12.7	4.76	0.4	2.1	5.16	EPSR 55° RE LE IC D1 S
		BM-DNGM150408TA2		●			▲										12.7	4.76	0.8	2.0	5.16	
		BM-DNGM150412TA2		●			▲										12.7	4.76	1.2	1.8	5.16	
		BM-DNGM150604TA2					▲										12.7	6.35	0.4	2.1	5.16	
		BM-DNGM150608TA2					▲										12.7	6.35	0.8	2.0	5.16	
(With Breaker)		BM-DNGM150612TA2					▲										12.7	6.35	1.2	1.8	5.16	
NEW PETIT CUT		BR-DNGM150404TA2		●													12.7	4.76	0.4	2.1	5.16	EPSR 55° RE LE IC D1 S
NEW		BR-DNGM150408TA2		●													12.7	4.76	0.8	2.0	5.16	
		BR-DNGM150412TA2		●													12.7	4.76	1.2	1.8	5.16	
		BR-DNGM150604TA2		●													12.7	6.35	0.4	2.1	5.16	
		BR-DNGM150608TA2		●													12.7	6.35	0.8	2.0	5.16	
(With Breaker)		BR-DNGM150612TA2		●													12.7	6.35	1.2	1.8	5.16	

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✻ : Unstable Cutting

Honing (Last letter of order number) : Refer to page B009.

* Please refer to B012 before using the wiper insert.

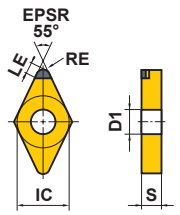
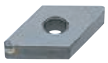
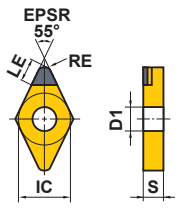
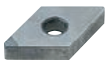
● = NEW

55° DN TYPE INSERTS WITH HOLE

Workpiece Material			BC8210 NEW	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110 NEW	MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140
	H	Hardened Materials	●	◐	●	●	◐	✲		●	◐	✲				
	K	Cast Iron							●				◐	●	◐	✲
	S	Heat Resistant Alloy, Titanium Alloy													●	
		Sintered Alloy											◐			

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✲ : Unstable Cutting

Honing (Last letter of order number) : Refer to page B009.

Shape	Order Number	Coated CBN							CBN							Solid CBN	Dimensions (mm)					Geometry
		BC8210 NEW	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110 NEW	MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140	IC	S	RE	LE	D1	
NEW PETIT CUT	NP-DNMA150404GS												▲	▲		12.7	4.76	0.4	1.5	5.16	
	NP-DNMA150408GS												▲	▲		12.7	4.76	0.8	1.7	5.16	
	NP-DNMA150404F												▲			12.7	4.76	0.4	1.5	5.16	
	NP-DNMA150408F												▲			12.7	4.76	0.8	1.7	5.16	
	NP-DNMA150404T													▲		12.7	4.76	0.4	1.5	5.16	
	NP-DNMA150408T													▲		12.7	4.76	0.8	1.7	5.16	
	DNGA150404												□	□		12.7	4.76	0.4	3.5	5.16	
	DNGA150408												□	□		12.7	4.76	0.8	3.1	5.16	
	DNGA150412												□	□		12.7	4.76	1.2	2.7	5.16	

● = NEW

● : Inventory maintained in Japan. □ : Non stock, produced to order only.
▲ : Inventory maintained in Japan. To be replaced by new products.

□ : If you purchase a produced-to-order product, the minimum number of lots is 10. (Contains one insert per case.)

90° SN TYPE INSERTS WITH HOLE

Workpiece Material			Coated CBN							CBN						Solid CBN	Dimensions (mm)					Geometry
			NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140	IC	S	RE	LE	D1	
Shape	Order Number																					
	H	Hardened Materials	●	◐	●	●	◐	✱		●	◐	✱										
	K	Cast Iron							●				◐	●	◐	✱						
	S	Heat Resistant Alloy, Titanium Alloy													●							
		Sintered Alloy											◐									
NEW PETIT CUT	NP-SNGA120404FS2												●				12.7	4.76	0.4	2.0	5.16	
	NP-SNGA120408FS2												●				12.7	4.76	0.8	2.2	5.16	
	NP-SNGA120412FS2												●				12.7	4.76	1.2	2.5	5.16	
	NP-SNGA120404GS2												●				12.7	4.76	0.4	2.0	5.16	
	NP-SNGA120408GS2								●				●	▲	▲		12.7	4.76	0.8	2.2	5.16	
	NP-SNGA120412GS2												●	▲	▲		12.7	4.76	1.2	2.5	5.16	
	NP-SNGA120408GA2		●				▲	●			●						12.7	4.76	0.8	2.2	5.16	
	NP-SNGA120412GA2		●				▲	●			●						12.7	4.76	1.2	2.5	5.16	
	NP-SNGA120404TS2												●				12.7	4.76	0.4	2.0	5.16	
	NP-SNGA120408TS2												●				12.7	4.76	0.8	2.2	5.16	
	NP-SNGA120412TS2												●				12.7	4.76	1.2	2.5	5.16	
	NP-SNGA120404SF2												●				12.7	4.76	0.4	2.0	5.16	
	NP-SNGA120408SF2												●				12.7	4.76	0.8	2.2	5.16	
	NP-SNGA120412SF2												●				12.7	4.76	1.2	2.5	5.16	
	NP-SNGA120404SE2												●				12.7	4.76	0.4	2.0	5.16	
	NP-SNGA120408SE2												●				12.7	4.76	0.8	2.2	5.16	
	NP-SNGA120412SE2												●				12.7	4.76	1.2	2.5	5.16	
NEW PETIT CUT	NP-SNMA120404GS													▲	▲		12.7	4.76	0.4	2.0	5.16	
	NP-SNMA120408GS													▲	▲		12.7	4.76	0.8	2.2	5.16	
	NP-SNMA120404F													▲			12.7	4.76	0.4	2.0	5.16	
	NP-SNMA120408F													▲			12.7	4.76	0.8	2.2	5.16	
	NP-SNMA120412F													▲			12.7	4.76	1.2	2.5	5.16	
	NP-SNMA120404T														▲		12.7	4.76	0.4	2.0	5.16	
	NP-SNMA120408T														▲		12.7	4.76	0.8	2.2	5.16	
	NP-SNMA120412T														▲		12.7	4.76	1.2	2.5	5.16	
	SNGA120404													□	□		12.7	4.76	0.4	4.0	5.16	
	SNGA120408													▲	▲		12.7	4.76	0.8	4.1	5.16	
	SNGA120412													▲	▲		12.7	4.76	1.2	4.0	5.16	
	SNGA120408															●	12.7	4.76	0.8	—	5.16	
	SNGA120412															●	12.7	4.76	1.2	—	5.16	

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✱ : Unstable Cutting

Honing (Last letter of order number) : Refer to page B009.

● = NEW

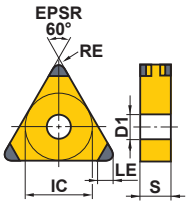
60° TN TYPE INSERTS WITH HOLE

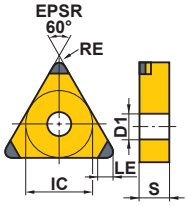
Workpiece Material			BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140
	H	Hardened Materials	●	◐	●	●	◐	✲		●	◐	✲				
	K	Cast Iron							●				◐	●	◐	✲
	S	Heat Resistant Alloy, Titanium Alloy													●	
		Sintered Alloy											◐			

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✲ : Unstable Cutting

Honing (Last letter of order number) : Refer to page B009.

Shape	Order Number	Coated CBN							CBN						Solid CBN	Dimensions (mm)					Geometry
		NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140	IC	S	RE	LE	D1	
NEW PETIT CUT	NP-TNGA160404FS6	●		●	▲	▲			●							9.525	4.76	0.4	1.6	3.81	
	NP-TNGA160408FS6	●		●	▲	▲			●							9.525	4.76	0.8	1.7	3.81	
	NP-TNGA160412FS6	●		●	▲	▲			●							9.525	4.76	1.2	1.9	3.81	
	NP-TNGA160404GS6	●		●	▲											9.525	4.76	0.4	1.6	3.81	
	NP-TNGA160408GS6	●		●	▲											9.525	4.76	0.8	1.7	3.81	
	NP-TNGA160412GS6	●		●	▲											9.525	4.76	1.2	1.9	3.81	
	NP-TNGA160404GA6		●			▲	●			●						9.525	4.76	0.4	1.6	3.81	
	NP-TNGA160408GA6		●			▲	●			●						9.525	4.76	0.8	1.7	3.81	
	NP-TNGA160412GA6		●			▲	●			●						9.525	4.76	1.2	1.9	3.81	
	NP-TNGA160404GH6		●		▲	▲	●									9.525	4.76	0.4	1.6	3.81	
	NP-TNGA160408GH6		●		▲	▲	●									9.525	4.76	0.8	1.7	3.81	
	NP-TNGA160412GH6		●		▲	▲	●									9.525	4.76	1.2	1.9	3.81	
	NEW NP-TNGA160404VA6		●													9.525	4.76	0.4	1.6	3.81	
	NEW NP-TNGA160408VA6		●													9.525	4.76	0.8	1.7	3.81	
	NEW NP-TNGA160412VA6		●													9.525	4.76	1.2	1.9	3.81	
	NP-TNGA160404TS6	●			▲											9.525	4.76	0.4	1.6	3.81	
	NP-TNGA160408TS6	●			▲											9.525	4.76	0.8	1.7	3.81	
	NP-TNGA160412TS6	●			▲											9.525	4.76	1.2	1.9	3.81	
	NP-TNGA160404TA6		●			▲	●			●	●					9.525	4.76	0.4	1.6	3.81	
	NP-TNGA160408TA6		●			▲	●			●	●					9.525	4.76	0.8	1.7	3.81	
	NP-TNGA160412TA6		●			▲	●			●	●					9.525	4.76	1.2	1.9	3.81	
	NP-TNGA160404TH6					▲	●				●					9.525	4.76	0.4	1.6	3.81	
	NP-TNGA160408TH6		●			▲	●				●					9.525	4.76	0.8	1.7	3.81	
	NP-TNGA160412TH6		●			▲	●				●					9.525	4.76	1.2	1.9	3.81	
NEW PETIT CUT	NP-TNGA160402FS3	●			▲				●							9.525	4.76	0.2	1.5	3.81	
	NP-TNGA160404FS3	●		●	▲	▲		●	●			●				9.525	4.76	0.4	1.6	3.81	
	NP-TNGA160408FS3	●		●	▲	▲		●	●			●				9.525	4.76	0.8	1.7	3.81	
	NP-TNGA160412FS3	●		●	▲	▲		●	●			●				9.525	4.76	1.2	1.9	3.81	
	NP-TNGA160402GS3	●			▲											9.525	4.76	0.2	1.5	3.81	
	NP-TNGA160404GS3	●		●	▲			●				●				9.525	4.76	0.4	1.6	3.81	
	NP-TNGA160408GS3	●		●	▲			●				●	▲	▲		9.525	4.76	0.8	1.7	3.81	
	NP-TNGA160412GS3	●		●	▲			●				●	▲	▲		9.525	4.76	1.2	1.9	3.81	
	NP-TNGA160402GA3		●			▲				●						9.525	4.76	0.2	1.5	3.81	
	NP-TNGA160404GA3		●			▲	●			●						9.525	4.76	0.4	1.6	3.81	
	NP-TNGA160408GA3		●			▲	●			●						9.525	4.76	0.8	1.7	3.81	
	NP-TNGA160412GA3		●			▲	●			●						9.525	4.76	1.2	1.9	3.81	
	NP-TNGA160404GH3		●		▲	▲	●									9.525	4.76	0.4	1.6	3.81	
	NP-TNGA160408GH3		●		▲	▲	●									9.525	4.76	0.8	1.7	3.81	
	NP-TNGA160412GH3		●		▲	▲	●									9.525	4.76	1.2	1.9	3.81	





● = NEW

● : Inventory maintained in Japan. □ : Non stock, produced to order only.
▲ : Inventory maintained in Japan. To be replaced by new products.

□ : If you purchase a produced-to-order product, the minimum number of lots is 10. (Contains one insert per case.)

Workpiece Material			Coated CBN							CBN						Solid CBN	Dimensions (mm)					Geometry
			NEW						NEW													
Shape		Order Number	BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140	IC	S	RE	LE	D1	
	H	Hardened Materials	●	◐	●	●	◐	✲		●	◐	✲										
	K	Cast Iron							●				◐	●	◐	✲						
	S	Heat Resistant Alloy, Titanium Alloy													●							
		Sintered Alloy											◐									
NEW PETIT CUT	NEW	NP-TNGA160404VA3		●													9.525	4.76	0.4	1.6	3.81	EPSR 60° RE D1 LE IC S
	NEW	NP-TNGA160408VA3		●													9.525	4.76	0.8	1.7	3.81	
	NEW	NP-TNGA160412VA3		●													9.525	4.76	1.2	1.9	3.81	
		NP-TNGA160404TS3	●			▲							●				9.525	4.76	0.4	1.6	3.81	
		NP-TNGA160408TS3	●			▲							●				9.525	4.76	0.8	1.7	3.81	
		NP-TNGA160412TS3	●			▲							●				9.525	4.76	1.2	1.9	3.81	
		NP-TNGA160404TA3		●			▲	●			●	●					9.525	4.76	0.4	1.6	3.81	
		NP-TNGA160408TA3		●			▲	●			●	●					9.525	4.76	0.8	1.7	3.81	
		NP-TNGA160412TA3		●			▲	●			●	●					9.525	4.76	1.2	1.9	3.81	
		NP-TNGA160404TH3					▲	●				●					9.525	4.76	0.4	1.6	3.81	
		NP-TNGA160408TH3		●			▲	●				●					9.525	4.76	0.8	1.7	3.81	
		NP-TNGA160412TH3		●			▲	●				●					9.525	4.76	1.2	1.9	3.81	
		NP-TNGA160404SF3											●				9.525	4.76	0.4	1.6	3.81	
		NP-TNGA160408SF3											●				9.525	4.76	0.8	1.7	3.81	
		NP-TNGA160412SF3											●				9.525	4.76	1.2	1.9	3.81	
		NP-TNGA160404SE3											●				9.525	4.76	0.4	1.6	3.81	
		NP-TNGA160408SE3											●				9.525	4.76	0.8	1.7	3.81	
		NP-TNGA160412SE3											●				9.525	4.76	1.2	1.9	3.81	
NEW PETIT CUT		BM-TNGM160408TA3					▲										9.525	4.76	0.8	1.7	3.81	EPSR 60° RE D1 LE IC S
		BM-TNGM160412TA3					▲										9.525	4.76	1.2	1.9	3.81	
(With Breaker)																						
NEW PETIT CUT		NP-TNMA160404GS												▲	▲		9.525	4.76	0.4	1.6	3.81	EPSR 60° LE RE D1 IC S
		NP-TNMA160408GS												▲	▲		9.525	4.76	0.8	1.7	3.81	
		NP-TNMA160412GS												▲	▲		9.525	4.76	1.2	1.9	3.81	
		NP-TNMA160404F												▲			9.525	4.76	0.4	1.6	3.81	
		NP-TNMA160408F												▲			9.525	4.76	0.8	1.7	3.81	
		NP-TNMA160412F												□			9.525	4.76	1.2	1.9	3.81	
		NP-TNMA160404T													▲		9.525	4.76	0.4	1.6	3.81	
		NP-TNMA160408T													▲		9.525	4.76	0.8	1.7	3.81	
		NP-TNMA160412T													□		9.525	4.76	1.2	1.9	3.81	
		TNGA160404												▲	▲		9.525	4.76	0.4	3.6	3.81	EPSR 60° LE RE D1 IC S
		TNGA160408												▲	▲		9.525	4.76	0.8	3.3	3.81	
		TNGA220404												▲	□		12.7	4.76	0.4	3.6	5.16	
		TNGA220408												▲	□		12.7	4.76	0.8	3.3	5.16	
		TNGA220412												▲	□		12.7	4.76	1.2	3.0	5.16	

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✲ : Unstable Cutting

Honing (Last letter of order number) : Refer to page B009.

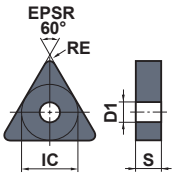
● = NEW

60° TN TYPE INSERTS WITH HOLE

Workpiece Material			BC8210 NEW	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110 NEW	MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140
	H	Hardened Materials	●	◐	●	●	◐	✲		●	◐	✲				
	K	Cast Iron							●				◐	●	◐	✲
	S	Heat Resistant Alloy, Titanium Alloy													●	
		Sintered Alloy											◐			

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✲ : Unstable Cutting

Honing (Last letter of order number) : Refer to page B009.

Shape	Order Number	IC	S	RE	LE	D1	Geometry
	**TNGA160408**	9.525	4.76	0.8	—	3.81	
	TNGA160412	9.525	4.76	1.2	—	3.81	

● = NEW

● : Inventory maintained in Japan. ▲ : Inventory maintained in Japan. To be replaced by new products.
(Contains one insert per case.)

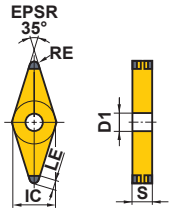
35° VN TYPE INSERTS WITH HOLE

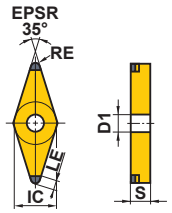
Workpiece Material			BC8210 NEW	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110 NEW	MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140
	H	Hardened Materials	●	◐	●	●	◐	✱		●	◐	✱				
	K	Cast Iron							●				◐	●	◐	✱
	S	Heat Resistant Alloy, Titanium Alloy													●	
		Sintered Alloy											◐			

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✱ : Unstable Cutting

Honing (Last letter of order number) : Refer to page B009.

Shape	Order Number	IC	S	RE	LE	D1	Geometry
NEW PETIT CUT	NP-VNGA160404FS4	9.525	4.76	0.4	2.5	3.81	
	NP-VNGA160408FS4	9.525	4.76	0.8	2.0	3.81	
	NP-VNGA160412FS4	9.525	4.76	1.2	1.5	3.81	
	NP-VNGA160404GS4	9.525	4.76	0.4	2.5	3.81	
	NP-VNGA160408GS4	9.525	4.76	0.8	2.0	3.81	
	NP-VNGA160412GS4	9.525	4.76	1.2	1.5	3.81	
	NP-VNGA160404GA4	9.525	4.76	0.4	2.5	3.81	
	NP-VNGA160408GA4	9.525	4.76	0.8	2.0	3.81	
	NP-VNGA160412GA4	9.525	4.76	1.2	1.5	3.81	
	NP-VNGA160404GH4	9.525	4.76	0.4	2.5	3.81	
	NP-VNGA160408GH4	9.525	4.76	0.8	2.0	3.81	
	NP-VNGA160412GH4	9.525	4.76	1.2	1.5	3.81	
	NEW NP-VNGA160404VA4	9.525	4.76	0.4	2.5	3.81	
	NEW NP-VNGA160408VA4	9.525	4.76	0.8	2.0	3.81	
	NEW NP-VNGA160412VA4	9.525	4.76	1.2	1.5	3.81	
	NP-VNGA160404TS4	9.525	4.76	0.4	2.5	3.81	
	NP-VNGA160408TS4	9.525	4.76	0.8	2.0	3.81	
	NP-VNGA160404TA4	9.525	4.76	0.4	2.5	3.81	
	NP-VNGA160408TA4	9.525	4.76	0.8	2.0	3.81	
	NP-VNGA160412TA4	9.525	4.76	1.2	1.5	3.81	
	NP-VNGA160404TH4	9.525	4.76	0.4	2.5	3.81	
	NP-VNGA160408TH4	9.525	4.76	0.8	2.0	3.81	
	NP-VNGA160412TH4	9.525	4.76	1.2	1.5	3.81	
NEW PETIT CUT	NP-VNGA160402FS2	9.525	4.76	0.2	2.5	3.81	
	NP-VNGA160404FS2	9.525	4.76	0.4	2.5	3.81	
	NP-VNGA160408FS2	9.525	4.76	0.8	2.0	3.81	
	NP-VNGA160412FS2	9.525	4.76	1.2	1.5	3.81	
	NP-VNGA160402GS2	9.525	4.76	0.2	2.5	3.81	
	NP-VNGA160404GS2	9.525	4.76	0.4	2.5	3.81	
	NP-VNGA160408GS2	9.525	4.76	0.8	2.0	3.81	
	NP-VNGA160412GS2	9.525	4.76	1.2	1.5	3.81	
	NP-VNGA160402GA2	9.525	4.76	0.2	2.5	3.81	
	NP-VNGA160404GA2	9.525	4.76	0.4	2.5	3.81	
	NP-VNGA160408GA2	9.525	4.76	0.8	2.0	3.81	
	NP-VNGA160412GA2	9.525	4.76	1.2	1.5	3.81	
	NP-VNGA160404GH2	9.525	4.76	0.4	2.5	3.81	
	NP-VNGA160408GH2	9.525	4.76	0.8	2.0	3.81	
	NP-VNGA160412GH2	9.525	4.76	1.2	1.5	3.81	
	NEW NP-VNGA160404VA2	9.525	4.76	0.4	2.5	3.81	
	NEW NP-VNGA160408VA2	9.525	4.76	0.8	2.0	3.81	
	NEW NP-VNGA160412VA2	9.525	4.76	1.2	1.5	3.81	





● = NEW

35° VN TYPE INSERTS WITH HOLE

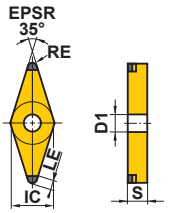
Workpiece Material		
H	Hardened Materials	
K	Cast Iron	
S	Heat Resistant Alloy, Titanium Alloy	
	Sintered Alloy	

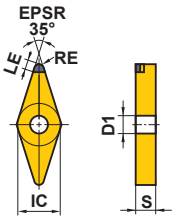
Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✠ : Unstable Cutting

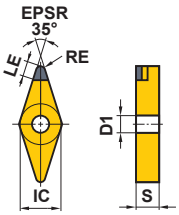
Honing (Last letter of order number) : Refer to page B009.

Shape	Order Number	Coated CBN							CBN						Solid CBN	Dimensions (mm)					Geometry
		NEW BC8210	NEW BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140	IC	S	RE	LE	D1	
NEW PETIT CUT	NP-VNGA160404TS2	●			▲							●				9.525	4.76	0.4	2.5	3.81	
	NP-VNGA160408TS2	●			▲							●				9.525	4.76	0.8	2.0	3.81	
	NP-VNGA160404TA2		●			▲	●			●						9.525	4.76	0.4	2.5	3.81	
	NP-VNGA160408TA2		●			▲	●			●						9.525	4.76	0.8	2.0	3.81	
	NP-VNGA160412TA2					▲	●			●						9.525	4.76	1.2	1.5	3.81	
	NP-VNGA160404TH2		●			▲	●									9.525	4.76	0.4	2.5	3.81	
	NP-VNGA160408TH2		●			▲	●									9.525	4.76	0.8	2.0	3.81	
	NP-VNGA160412TH2					▲	●									9.525	4.76	1.2	1.5	3.81	
	NP-VNGA160404SF2											●				9.525	4.76	0.4	2.5	3.81	
	NP-VNGA160408SF2											●				9.525	4.76	0.8	2.0	3.81	
	NP-VNGA160404SE2											●				9.525	4.76	0.4	2.5	3.81	
	NP-VNGA160408SE2											●				9.525	4.76	0.8	2.0	3.81	
NEW PETIT CUT	NP-VNMA160404GS												▲	▲		9.525	4.76	0.4	1.3	3.81	
	NP-VNMA160408GS												▲	▲		9.525	4.76	0.8	1.4	3.81	
	NP-VNMA160404F												▲			9.525	4.76	0.4	1.3	3.81	
	NP-VNMA160408F												▲			9.525	4.76	0.8	1.4	3.81	
	NP-VNMA160404T													▲		9.525	4.76	0.4	1.3	3.81	
	NP-VNMA160408T													▲		9.525	4.76	0.8	1.4	3.81	
	VNGA160404												□	□		9.525	4.76	0.4	2.8	3.81	
	VNGA160408												□	□		9.525	4.76	0.8	1.9	3.81	







● = NEW

● : Inventory maintained in Japan. □ : Non stock, produced to order only.
▲ : Inventory maintained in Japan. To be replaced by new products.

□ : If you purchase a produced-to-order product, the minimum number of lots is 10. (Contains one insert per case.)

80° WN TYPE INSERTS WITH HOLE

Workpiece Material			Coated CBN							CBN						Solid CBN	Dimensions (mm)					Geometry
			NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140	IC	S	RE	LE	D1	
	H	Hardened Materials	●	◐	●	●	◐	✱		●	◐	✱										
	K	Cast Iron							●				◐	●	◐	✱						
	S	Heat Resistant Alloy, Titanium Alloy													●							
		Sintered Alloy											◐									
NEW PETIT CUT	NP-WNGA080408FS6		●		●	▲											12.7	4.76	0.8	2.0	5.16	EPSR 80° RE D1 LE IC S
	NP-WNGA080408GS6		●		●	▲											12.7	4.76	0.8	2.0	5.16	
	NP-WNGA080408TS6		●			▲											12.7	4.76	0.8	2.0	5.16	
NEW PETIT CUT	NP-WNGA080408FS3		●		●	▲	▲						●				12.7	4.76	0.8	2.0	5.16	EPSR 80° RE D1 LE IC S
	NP-WNGA080408GS3		●		●	▲							●				12.7	4.76	0.8	2.0	5.16	
	NP-WNGA080408GA3			●			▲	●									12.7	4.76	0.8	2.0	5.16	
	NP-WNGA080408GH3					▲	▲	●									12.7	4.76	0.8	2.0	5.16	
	NP-WNGA080408TS3		●			▲							●				12.7	4.76	0.8	2.0	5.16	
	NP-WNGA080408TA3			●			▲	●									12.7	4.76	0.8	2.0	5.16	
	NP-WNGA080408TH3						▲	●									12.7	4.76	0.8	2.0	5.16	
	NP-WNGA080408SF3												●				12.7	4.76	0.8	2.0	5.16	
	NP-WNGA080408SE3												●				12.7	4.76	0.8	2.0	5.16	
NEW PETIT CUT (With Wiper) *	NP-WNGA080408GSWS3		●			▲											12.7	4.76	0.8	2.0	5.16	EPSR 80° RE D1 LE IC S

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✱ : Unstable Cutting

Honing (Last letter of order number) : Refer to page B009.

* Please refer to B012 before using the wiper insert.

● = NEW

CBN TURNING INSERTS [NEGATIVE]

80° CN TYPE INSERTS WITHOUT HOLE

Workpiece Material			Coated CBN							CBN						Solid CBN	Dimensions (mm)				Geometry
			NEW BC8210	NEW BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140	IC	S	RE	LE	
H	Hardened Materials	●	◐	●	●	◐	✲		●	◐	✲										
K	Cast Iron							●				◐	●	◐	✲						
S	Heat Resistant Alloy, Titanium Alloy													●							
	Sintered Alloy											◐									
Shape	Order Number																				
	CNGN120404														●	12.7	4.76	0.4	—	EPSR 80° RE IC S
	CNGN120408														●	12.7	4.76	0.8	—	
	CNGN120412														●	12.7	4.76	1.2	—	

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✲ : Unstable Cutting

● = NEW

55° DN TYPE INSERTS WITHOUT HOLE

Workpiece Material			Coated CBN							CBN						Solid CBN	Dimensions (mm)				Geometry
			NEW BC8210	NEW BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140	IC	S	RE	LE	
H	Hardened Materials	●	◐	●	●	◐	✲		●	◐	✲										
K	Cast Iron							●				◐	●	◐	✲						
S	Heat Resistant Alloy, Titanium Alloy													●							
	Sintered Alloy											◐									
Shape	Order Number																				
	DNGN110308														●	9.525	3.18	0.8	—	EPSR 55° RE IC S
	DNGN110312														●	9.525	3.18	1.2	—	

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✲ : Unstable Cutting

● = NEW

RN TYPE INSERTS WITHOUT HOLE

Workpiece Material			Coated CBN							CBN						Solid CBN	Dimensions (mm)				Geometry
			NEW BC8210	NEW BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140	IC	S	LE	RE	
H	Hardened Materials	●	◐	●	●	◐	✲		●	◐	✲										
K	Cast Iron							●				◐	●	◐	✲						
S	Heat Resistant Alloy, Titanium Alloy													●							
	Sintered Alloy											◐									
Shape	Order Number																				
	RNGN090300														●	9.525	3.18	—	—	IC S
	RNGN120300														●	12.7	3.18	—	—	
	RNGN120400														●	12.7	4.76	—	—	

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✲ : Unstable Cutting

● = NEW

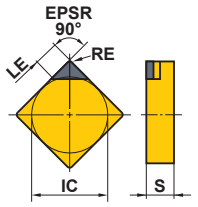
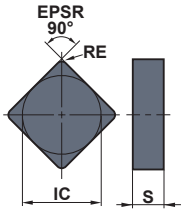
● : Inventory maintained in Japan. □ : Non stock, produced to order only.
▲ : Inventory maintained in Japan. To be replaced by new products.

□ : If you purchase a produced-to-order product, the minimum number of lots is 10. (Contains one insert per case.)

90° SN TYPE INSERTS WITHOUT HOLE

Workpiece Material			Coated CBN							CBN						Solid CBN	Dimensions (mm)				Geometry
			NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140	IC	S	RE	LE	
H	Hardened Materials	●	◐	●	●	◐	✲		●	◐	✲					✲					
K	Cast Iron							●				◐	●	◐		✲					
S	Heat Resistant Alloy, Titanium Alloy													●							
	Sintered Alloy												◐								

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✲ : Unstable Cutting

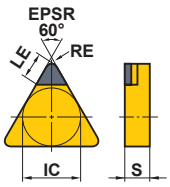
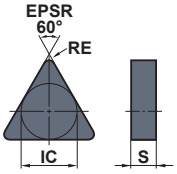
Shape	Order Number																				
	SNGN090304													□	□		9.525	3.18	0.4	4.0	
	SNGN090308													□	□		9.525	3.18	0.8	4.1	
	SNGN120404													□	□		12.7	4.76	0.4	4.0	
	SNGN120408													▲	□		12.7	4.76	0.8	4.1	
	SNGN120412													▲	□		12.7	4.76	1.2	4.0	
	SNGN090308															●	9.525	3.18	0.8	—	
	SNGN090312															●	9.525	3.18	1.2	—	
	SNGN090316															●	9.525	3.18	1.6	—	
	SNGN090408															●	9.525	4.76	0.8	—	
	SNGN090412															●	9.525	4.76	1.2	—	
	SNGN120408															●	12.7	4.76	0.8	—	
	SNGN120412															●	12.7	4.76	1.2	—	
	SNGN120416															●	12.7	4.76	1.6	—	

● = NEW

60° TN TYPE INSERTS WITHOUT HOLE

Workpiece Material			Coated CBN							CBN						Solid CBN	Dimensions (mm)				Geometry
			NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140	IC	S	RE	LE	
H	Hardened Materials	●	◐	●	●	◐	✲		●	◐	✲					✲					
K	Cast Iron							●				◐	●	◐		✲					
S	Heat Resistant Alloy, Titanium Alloy													●							
	Sintered Alloy												◐								

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✲ : Unstable Cutting

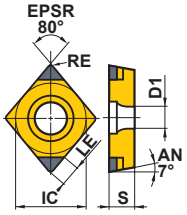
Shape	Order Number																				
	TNGN160404													▲	□		9.525	4.76	0.4	3.6	
	TNGN160408													▲	□		9.525	4.76	0.8	3.3	
	TNGN160408															●	9.525	4.76	0.8	—	
	TNGN160412															●	9.525	4.76	1.2	—	
	TNGN160416															●	9.525	4.76	1.6	—	

● = NEW

80° CC TYPE INSERTS WITH HOLE

Workpiece Material			Coated CBN							CBN						Cutting Conditions (Guide) : ●: Stable Cutting ◐: General Cutting ✱: Unstable Cutting Honing (Last letter of order number) : Refer to page B009.
	H	Hardened Materials	●	◐	●	●	◐	✱		●	◐	✱				
	K	Cast Iron							●				◐	●	◐	
	S	Heat Resistant Alloy, Titanium Alloy													●	
		Sintered Alloy											◐			

Shape	Order Number	Coated CBN							CBN						Dimensions (mm)					Geometry
		NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730	IC	S	RE	LE	D1	
NEW PETIT CUT	NP-CCGW060202FS2	●			▲			●	●			●			6.35	2.38	0.2	1.7	2.8	
	NP-CCGW060204FS2	●			▲			●	●			●			6.35	2.38	0.4	1.8	2.8	
	NP-CCGW060208FS2	●			▲				●			●			6.35	2.38	0.8	2.0	2.8	
	NP-CCGW09T302FS2	●		●	▲				●			●			9.525	3.97	0.2	1.7	4.4	
	NP-CCGW09T304FS2	●		●	▲	▲		●	●			●			9.525	3.97	0.4	1.8	4.4	
	NP-CCGW09T308FS2	●		●	▲	▲		●	●			●			9.525	3.97	0.8	2.0	4.4	
	NP-CCGW060202FA2												▲	▲	6.35	2.38	0.2	1.7	2.8	
	NP-CCGW060204FA2												▲	▲	6.35	2.38	0.4	1.8	2.8	
	NP-CCGW060208FA2												▲	▲	6.35	2.38	0.8	2.0	2.8	
	NP-CCGW09T304FA2												▲	▲	9.525	3.97	0.4	1.8	4.4	
	NP-CCGW09T308FA2												▲	▲	9.525	3.97	0.8	2.0	4.4	
	NP-CCGW060202GS2	●		●	▲			●				●	▲	▲	6.35	2.38	0.2	1.7	2.8	
	NP-CCGW060204GS2	●		●	▲							●	▲	▲	6.35	2.38	0.4	1.8	2.8	
	NP-CCGW060208GS2	●		●	▲							●	▲	▲	6.35	2.38	0.8	2.0	2.8	
	NP-CCGW09T302GS2	●		●	▲							●			9.525	3.97	0.2	1.7	4.4	
	NP-CCGW09T304GS2	●		●	▲			●				●	▲	▲	9.525	3.97	0.4	1.8	4.4	
	NP-CCGW09T308GS2	●		●	▲			●				●	▲	▲	9.525	3.97	0.8	2.0	4.4	
	NP-CCGW060202GA2		●			▲			●						6.35	2.38	0.2	1.7	2.8	
	NP-CCGW060204GA2		●			▲	●		●						6.35	2.38	0.4	1.8	2.8	
	NP-CCGW060208GA2		●			▲	●		●						6.35	2.38	0.8	2.0	2.8	
	NP-CCGW09T302GA2		●			▲			●						9.525	3.97	0.2	1.7	4.4	
	NP-CCGW09T304GA2		●			▲	●		●						9.525	3.97	0.4	1.8	4.4	
	NP-CCGW09T308GA2		●			▲	●		●						9.525	3.97	0.8	2.0	4.4	
	NP-CCGW09T304GH2				▲	▲	●								9.525	3.97	0.4	1.8	4.4	
	NP-CCGW09T308GH2				▲	▲	●								9.525	3.97	0.8	2.0	4.4	
	NEW NP-CCGW09T304VA2		●												9.525	3.97	0.4	1.8	4.4	
	NEW NP-CCGW09T308VA2		●												9.525	3.97	0.8	2.0	4.4	
	NP-CCGW060208TS2											●			6.35	2.38	0.8	2.0	2.8	
	NP-CCGW09T308TS2											●			9.525	3.97	0.8	2.0	4.4	
	NP-CCGW060204TA2						●			●					6.35	2.38	0.4	1.8	2.8	
	NP-CCGW060208TA2						●			●					6.35	2.38	0.8	2.0	2.8	
	NP-CCGW09T304TA2		●			▲	●			●	●				9.525	3.97	0.4	1.8	4.4	
	NP-CCGW09T308TA2		●			▲	●			●	●				9.525	3.97	0.8	2.0	4.4	
	NP-CCGW09T304TH2					▲	●				●				9.525	3.97	0.4	1.8	4.4	
	NP-CCGW09T308TH2					▲	●				●				9.525	3.97	0.8	2.0	4.4	
	NP-CCGW060202SF2											●			6.35	2.38	0.2	1.7	2.8	
	NP-CCGW060204SF2											●			6.35	2.38	0.4	1.8	2.8	
	NP-CCGW060208SF2											●			6.35	2.38	0.8	2.0	2.8	
	NP-CCGW09T302SF2											●			9.525	3.97	0.2	1.7	4.4	
	NP-CCGW09T304SF2											●			9.525	3.97	0.4	1.8	4.4	
	NP-CCGW09T308SF2											●			9.525	3.97	0.8	2.0	4.4	



● = NEW

● : Inventory maintained in Japan. ▲ : Inventory maintained in Japan. To be replaced by new products.
(Contains one insert per case.)

Workpiece Material			Coated CBN							CBN						Cutting Conditions (Guide) : ● : Stable Cutting ◐ : General Cutting ✱ : Unstable Cutting Honing (Last letter of order number) : Refer to page B009.
	H	Hardened Materials	●	◐	●	●	◐	✱		●	◐	✱				
	K	Cast Iron							●				◐	●	◐	
	S	Heat Resistant Alloy, Titanium Alloy													●	
		Sintered Alloy											◐			

Shape	Order Number	Coated CBN							CBN						Dimensions (mm)					Geometry
		NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730	IC	S	RE	LE	D1	
NEW PETIT CUT	NP-CCGW060202SE2											●			6.35	2.38	0.2	1.7	2.8	EPSR 80° RE D1 LE AN 7° IC S
	NP-CCGW060204SE2											●			6.35	2.38	0.4	1.8	2.8	
	NP-CCGW060208SE2											●			6.35	2.38	0.8	2.0	2.8	
	NP-CCGW09T302SE2											●			9.525	3.97	0.2	1.7	4.4	
	NP-CCGW09T304SE2											●			9.525	3.97	0.4	1.8	4.4	
	NP-CCGW09T308SE2											●			9.525	3.97	0.8	2.0	4.4	
NEW PETIT CUT (With Wiper) ✱1	NP-CCGW09T304FSWS2	●		●	▲	▲			●						9.525	3.97	0.4	1.8	4.4	EPSR 80° RE D1 LE AN 7° IC S
	NP-CCGW09T308FSWS2	●		●	▲	▲			●						9.525	3.97	0.8	2.0	4.4	
	NP-CCGW09T304FBWL2			●	▲	▲			●						9.525	3.97	0.4	1.8	4.4	
	NP-CCGW09T308FBWL2			●	▲	▲			●						9.525	3.97	0.8	2.0	4.4	
	NP-CCGW09T304GSWS2	●		●	▲										9.525	3.97	0.4	1.8	4.4	
	NP-CCGW09T308GSWS2	●		●	▲										9.525	3.97	0.8	2.0	4.4	
	NP-CCGW09T304GAWS2		●			▲	●			●					9.525	3.97	0.4	1.8	4.4	
	NP-CCGW09T308GAWS2		●			▲	●			●					9.525	3.97	0.8	2.0	4.4	
	NP-CCGW09T304GBWL2			●	▲	▲				●					9.525	3.97	0.4	1.8	4.4	
	NP-CCGW09T308GBWL2			●	▲	▲				●					9.525	3.97	0.8	2.0	4.4	
NEW PETIT CUT (With Breaker)	BF-CCGT09T304TS2	●			▲										9.525	3.97	0.4	1.8	4.4	EPSR 80° RE D1 LE AN 7° IC S
	BF-CCGT09T308TS2	●			▲										9.525	3.97	0.8	2.0	4.4	
NEW PETIT CUT (With Breaker)	BM-CCGT09T304TA2		●			▲									9.525	3.97	0.4	1.8	4.4	EPSR 80° RE D1 LE AN 7° IC S
	BM-CCGT09T308TA2		●			▲									9.525	3.97	0.8	2.0	4.4	
NEW PETIT CUT	✱2 NP-CCGW03S102FS	●			▲				●						3.57	1.39	0.2	1.1	2.0	EPSR 80° LE RE D1 AN 7° IC S
	✱2 NP-CCGW03S104FS	●			▲				●						3.57	1.39	0.4	1.0	2.0	
	✱2 NP-CCGW04T002FS	●			▲				●						4.37	1.79	0.2	1.5	2.4	
	✱2 NP-CCGW04T004FS	●			▲				●						4.37	1.79	0.4	1.4	2.4	
	✱2 NP-CCGW03S102GS			●											3.57	1.39	0.2	1.1	2.0	
	✱2 NP-CCGW03S104GS			●											3.57	1.39	0.4	1.0	2.0	
	✱2 NP-CCGW04T002GS			●											4.37	1.79	0.2	1.5	2.4	
	✱2 NP-CCGW04T004GS			●											4.37	1.79	0.4	1.4	2.4	
	NP-CCGW09T302GS												▲	▲	9.525	3.97	0.2	1.7	4.4	
	NP-CCGW09T304GS												▲	▲	9.525	3.97	0.4	1.8	4.4	

✱1 Please refer to B012 before using the wiper insert.
✱2 Diameter of inscribed circle is special. (For SCLC type)

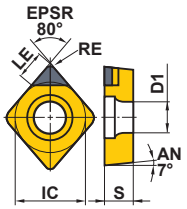
● = NEW

80° CC TYPE INSERTS WITH HOLE

Workpiece Material			BC8210 NEW	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110 NEW	MB8110	MB8120	MB8130	MB4120	MB710	MB730
	H	Hardened Materials	●	◐	●	●	◐	✲		●	◐	✲			
	K	Cast Iron							●				◐	●	◐
	S	Heat Resistant Alloy, Titanium Alloy													●
		Sintered Alloy											◐		

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✲ : Unstable Cutting

Honing (Last letter of order number) : Refer to page B009.

Shape	Order Number	Coated CBN							CBN						Dimensions (mm)					Geometry
		BC8210 NEW	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110 NEW	MB8110	MB8120	MB8130	MB4120	MB710	MB730	IC	S	RE	LE	D1	
	CCMW060202												□	□	6.35	2.38	0.2	2.8	2.8	
	CCMW060204												□	□	6.35	2.38	0.4	2.7	2.8	
	CCMW09T302												□	□	9.525	3.97	0.2	3.7	4.4	
	CCMW09T304												□	□	9.525	3.97	0.4	3.6	4.4	
	CCMW09T308												□	□	9.525	3.97	0.8	3.6	4.4	
	CCMW120404												□	□	12.7	4.76	0.4	3.6	5.5	
	CCMW120408												□	□	12.7	4.76	0.8	3.6	5.5	
	CCMW120412												□	□	12.7	4.76	1.2	3.6	5.5	

● = NEW

● : Inventory maintained in Japan. □ : Non stock, produced to order only.
▲ : Inventory maintained in Japan. To be replaced by new products.

□ : If you purchase a produced-to-order product, the minimum number of lots is 10. (Contains one insert per case.)

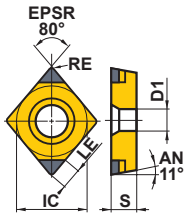
80° CP TYPE INSERTS WITH HOLE

Workpiece Material			BC8210 NEW	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110 NEW	MB8110	MB8120	MB8130	MB4120	MB710	MB730
	H	Hardened Materials	●	◐	●	●	◐	✱		●	◐	✱			
	K	Cast Iron							●				◐	●	◐
	S	Heat Resistant Alloy, Titanium Alloy													●
		Sintered Alloy											◐		

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✱ : Unstable Cutting

Honing (Last letter of order number) : Refer to page B009.

Shape	Order Number	Coated CBN							CBN						Dimensions (mm)					Geometry
		BC8210 NEW	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110 NEW	MB8110	MB8120	MB8130	MB4120	MB710	MB730	IC	S	RE	LE	D1	
NEW PETIT CUT	NP-CPGB080202FS2											●			7.94	2.38	0.2	1.7	3.5	
	NP-CPGB080204FS2				▲							●			7.94	2.38	0.4	1.8	3.5	
	NP-CPGB080208FS2				▲										7.94	2.38	0.8	2.0	3.5	
	NP-CPGB090302FS2			●	▲							●			9.525	3.18	0.2	1.7	4.5	
	NP-CPGB090304FS2			●		▲						●			9.525	3.18	0.4	1.8	4.5	
	NP-CPGB090308FS2			●		▲						●			9.525	3.18	0.8	2.0	4.5	
	NP-CPGB090312FS2					▲									9.525	3.18	1.2	2.2	4.5	
	NP-CPGB080204GS2	●		●	▲										7.94	2.38	0.4	1.8	3.5	
	NP-CPGB080208GS2	●		●	▲										7.94	2.38	0.8	2.0	3.5	
	NP-CPGB090302GS2	●		●	▲										9.525	3.18	0.2	1.7	4.5	
	NP-CPGB090304GS2	●		●	▲										9.525	3.18	0.4	1.8	4.5	
	NP-CPGB090308GS2	●		●	▲										9.525	3.18	0.8	2.0	4.5	
	NP-CPGB080204GA2		●			▲	●								7.94	2.38	0.4	1.8	3.5	
	NP-CPGB080208GA2		●			▲	●								7.94	2.38	0.8	2.0	3.5	
	NP-CPGB080212GA2		●			▲	●								7.94	2.38	1.2	2.2	3.5	
	NP-CPGB090302GA2		●			▲									9.525	3.18	0.2	1.7	4.5	
	NP-CPGB090304GA2		●			▲	●								9.525	3.18	0.4	1.8	4.5	
	NP-CPGB090308GA2		●			▲	●								9.525	3.18	0.8	2.0	4.5	
	NP-CPGB090312GA2		●			▲	●								9.525	3.18	1.2	2.2	4.5	
	NEW NP-CPGB090304VA2		●												9.525	3.18	0.4	1.8	4.5	
	NEW NP-CPGB090308VA2		●												9.525	3.18	0.8	2.0	4.5	
	NEW NP-CPGB090312VA2		●												9.525	3.18	1.2	2.2	4.5	
	NP-CPGB080204TA2						●								7.94	2.38	0.4	1.8	3.5	
	NP-CPGB080208TA2						●								7.94	2.38	0.8	2.0	3.5	
	NP-CPGB080212TA2						●								7.94	2.38	1.2	2.2	3.5	
	NP-CPGB090304TA2		●			▲	●								9.525	3.18	0.4	1.8	4.5	
	NP-CPGB090308TA2		●			▲	●								9.525	3.18	0.8	2.0	4.5	
	NP-CPGB090312TA2		●			▲	●								9.525	3.18	1.2	2.2	4.5	
	NP-CPGB080202SE2											●			7.94	2.38	0.2	1.7	3.5	
	NP-CPGB080204SE2											●			7.94	2.38	0.4	1.8	3.5	
	NP-CPGB090302SE2											●			9.525	3.18	0.2	1.7	4.5	
	NP-CPGB090304SE2											●			9.525	3.18	0.4	1.8	4.5	
	NP-CPGB090308SE2											●			9.525	3.18	0.8	2.0	4.5	



● = NEW

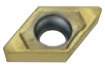
55° DC TYPE INSERTS WITH HOLE

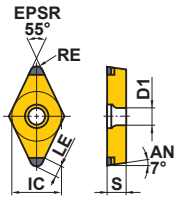
Workpiece Material			BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730
	H	Hardened Materials	●	◐	●	●	◐	✲		●	◐	✲			
	K	Cast Iron							●				◐	●	◐
	S	Heat Resistant Alloy, Titanium Alloy													●
		Sintered Alloy											◐		

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✲ : Unstable Cutting

Honing (Last letter of order number) : Refer to page B009.

Shape	Order Number	Coated CBN							CBN						Dimensions (mm)					Geometry
		NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730	IC	S	RE	LE	D1	
NEW PETIT CUT	NP-DCGW070202FS2	●			▲				●						6.35	2.38	0.2	2.2	2.8	
	NP-DCGW070204FS2	●			▲	▲		●	●			●			6.35	2.38	0.4	2.1	2.8	
	NP-DCGW070208FS2	●			▲				●			●			6.35	2.38	0.8	2.0	2.8	
	NP-DCGW11T302FS2	●		●	▲				●			●			9.525	3.97	0.2	2.2	4.4	
	NP-DCGW11T304FS2	●		●	▲	▲			●			●			9.525	3.97	0.4	2.1	4.4	
	NP-DCGW11T308FS2	●		●	▲	▲		●	●			●			9.525	3.97	0.8	2.0	4.4	
	NP-DCGW11T304FA2												▲	▲	9.525	3.97	0.4	1.5	4.4	
	NP-DCGW11T308FA2												▲	▲	9.525	3.97	0.8	1.7	4.4	
	NP-DCGW070202GS2	●		●	▲										6.35	2.38	0.2	2.2	2.8	
	NP-DCGW070204GS2	●		●	▲			●				●			6.35	2.38	0.4	2.1	2.8	
	NP-DCGW070208GS2	●		●	▲							●			6.35	2.38	0.8	2.0	2.8	
	NP-DCGW11T302GS2	●		●	▲							●			9.525	3.97	0.2	2.2	4.4	
	NP-DCGW11T304GS2	●		●	▲			●				●	▲	▲	9.525	3.97	0.4	2.1	4.4	
	NP-DCGW11T308GS2	●		●	▲			●				●	▲	▲	9.525	3.97	0.8	2.0	4.4	
	NP-DCGW070202GA2		●			▲				●					6.35	2.38	0.2	2.2	2.8	
	NP-DCGW070204GA2		●			▲	●			●					6.35	2.38	0.4	2.1	2.8	
	NP-DCGW070208GA2		●				●								6.35	2.38	0.8	2.0	2.8	
	NP-DCGW11T302GA2		●			▲				●					9.525	3.97	0.2	2.2	4.4	
	NP-DCGW11T304GA2		●			▲	●			●					9.525	3.97	0.4	2.1	4.4	
	NP-DCGW11T308GA2		●			▲	●			●					9.525	3.97	0.8	2.0	4.4	
	NP-DCGW11T304GH2				▲	▲	●								9.525	3.97	0.4	2.1	4.4	
	NP-DCGW11T308GH2				▲	▲	●								9.525	3.97	0.8	2.0	4.4	
	NEW NP-DCGW11T304VA2		●												9.525	3.97	0.4	2.1	4.4	
	NEW NP-DCGW11T308VA2		●												9.525	3.97	0.8	2.0	4.4	
	NP-DCGW070204TA2						●				●				6.35	2.38	0.4	2.1	2.8	
	NP-DCGW070208TA2						●				●				6.35	2.38	0.8	2.0	2.8	
	NP-DCGW11T304TA2		●			▲	●			●	●				9.525	3.97	0.4	2.1	4.4	
	NP-DCGW11T308TA2		●			▲	●			●	●				9.525	3.97	0.8	2.0	4.4	
	NP-DCGW11T304TH2					▲	●				●				9.525	3.97	0.4	2.1	4.4	
	NP-DCGW11T308TH2					▲	●				●				9.525	3.97	0.8	2.0	4.4	
	NP-DCGW070204SF2											●			6.35	2.38	0.4	2.1	2.8	
	NP-DCGW070208SF2											●			6.35	2.38	0.8	2.0	2.8	
	NP-DCGW11T302SF2											●			9.525	3.97	0.2	2.2	4.4	
	NP-DCGW11T304SF2											●			9.525	3.97	0.4	2.1	4.4	
	NP-DCGW11T308SF2											●			9.525	3.97	0.8	2.0	4.4	
	NP-DCGW070204SE2											●			6.35	2.38	0.4	2.1	2.8	
	NP-DCGW070208SE2											●			6.35	2.38	0.8	2.0	2.8	
	NP-DCGW11T302SE2											●			9.525	3.97	0.2	2.2	4.4	
	NP-DCGW11T304SE2											●			9.525	3.97	0.4	2.1	4.4	
	NP-DCGW11T308SE2											●			9.525	3.97	0.8	2.0	4.4	





● = NEW

● : Inventory maintained in Japan. □ : Non stock, produced to order only.
▲ : Inventory maintained in Japan. To be replaced by new products.

□ : If you purchase a produced-to-order product, the minimum number of lots is 10. (Contains one insert per case.)

Workpiece Material			Coated CBN							CBN						Dimensions (mm)					Geometry
			NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730	IC	S	RE	LE	D1	
	H	Hardened Materials	●	◐	●	●	◐	✠		●	◐	✠									
	K	Cast Iron							●				◐	●	◐						
	S	Heat Resistant Alloy, Titanium Alloy													●						
		Sintered Alloy											◐								
NEW PETIT CUT		BF-DCGT11T304TS2	●			▲										9.525	3.97	0.4	2.1	4.4	EPSR 55° RE LE IC D1 AN 7° S
		BF-DCGT11T308TS2	●			▲										9.525	3.97	0.8	2.0	4.4	
(With Breaker)																					
NEW PETIT CUT		BM-DCGT11T304TA2		●			▲									9.525	3.97	0.4	2.1	4.4	EPSR 55° RE LE IC D1 AN 7° S
		BM-DCGT11T308TA2		●			▲									9.525	3.97	0.8	2.0	4.4	
(With Breaker)																					
NEW PETIT CUT		NP-DCGW11T302GS												▲	▲	9.525	3.97	0.2	1.4	4.4	EPSR 55° LE RE IC D1 AN 7° S
		NP-DCGW11T304GS												▲	▲	9.525	3.97	0.4	1.5	4.4	
		DCMW070202												□	□	6.35	2.38	0.2	2.7	2.8	EPSR 55° LE RE IC D1 AN 7° S
		DCMW070204												□	□	6.35	2.38	0.4	2.5	2.8	
		DCMW11T302												□	□	9.525	3.97	0.2	3.7	4.4	
		DCMW11T304												□	□	9.525	3.97	0.4	3.4	4.4	

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✠ : Unstable Cutting

Honing (Last letter of order number) : Refer to page B009.

● = NEW

Scan here for product NEWS ▶

EXTERNAL TURNING ➤ C002—C005
BORING ➤ E002—E005
SMALL TOOLS ➤ D011, D026
GRADES ➤ B006
IDENTIFICATION ➤ B002

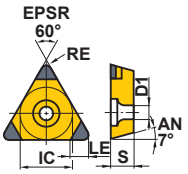
60° TC TYPE INSERTS WITH HOLE

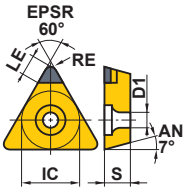
Workpiece Material			BC8210 NEW	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110 NEW	MB8110	MB8120	MB8130	MB4120	MB710	MB730
	H	Hardened Materials	●	◐	●	●	◐	✱		●	◐	✱			
	K	Cast Iron							●				◐	●	◐
	S	Heat Resistant Alloy, Titanium Alloy													●
		Sintered Alloy											◐		

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✱ : Unstable Cutting

Honing (Last letter of order number) : Refer to page B009.

Shape	Order Number	IC	S	RE	LE	D1	Geometry
NEW PETIT CUT	NP-TCGW110204FS3	6.35	2.38	0.4	1.6	2.8	
	NP-TCGW110208FS3	6.35	2.38	0.8	1.7	2.8	
	NP-TCGW110204FA3	6.35	2.38	0.4	1.6	2.8	
	NP-TCGW110208FA3	6.35	2.38	0.8	1.7	2.8	
	NP-TCGW090204GS3	5.56	2.38	0.4	1.6	2.5	
	NP-TCGW090208GS3	5.56	2.38	0.8	1.7	2.5	
	NP-TCGW110202GS3	6.35	2.38	0.2	1.5	2.8	
	NP-TCGW110204GS3	6.35	2.38	0.4	1.6	2.8	
	NP-TCGW110208GS3	6.35	2.38	0.8	1.7	2.8	
	NP-TCGW130304GS3	7.94	3.18	0.4	1.6	3.4	
	NP-TCGW130308GS3	7.94	3.18	0.8	1.7	3.4	
	NP-TCGW16T304GS3	9.525	3.97	0.4	1.6	4.4	
	NP-TCGW16T308GS3	9.525	3.97	0.8	1.7	4.4	
	NP-TCGW110204SF3	6.35	2.38	0.4	1.6	2.8	
	NP-TCGW110208SF3	6.35	2.38	0.8	1.7	2.8	
	NP-TCGW110204SE3	6.35	2.38	0.4	1.6	2.8	
	NP-TCGW110208SE3	6.35	2.38	0.8	1.7	2.8	
	TCMW110202	6.35	2.38	0.2	2.7	2.8	
	TCMW110204	6.35	2.38	0.4	2.6	2.8	





● = NEW

● : Inventory maintained in Japan. □ : Non stock, produced to order only.
▲ : Inventory maintained in Japan. To be replaced by new products.

□ : If you purchase a produced-to-order product, the minimum number of lots is 10. (Contains one insert per case.)

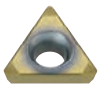
60° TP TYPE INSERTS WITH HOLE

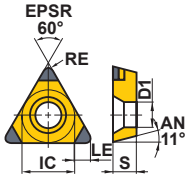
Workpiece Material			BC8210 NEW	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110 NEW	MB8110	MB8120	MB8130	MB4120	MB710	MB730
	H	Hardened Materials	●	◐	●	●	◐	✱		●	◐	✱			
	K	Cast Iron							●				◐	●	◐
	S	Heat Resistant Alloy, Titanium Alloy													●
		Sintered Alloy											◐		

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✱ : Unstable Cutting

Honing (Last letter of order number) : Refer to page B009.

Shape	Order Number	IC	S	RE	LE	D1	Geometry
NEW PETIT CUT	NP-TPGB090202FS3	5.56	2.38	0.2	1.5	2.9	
	NP-TPGB090204FS3	5.56	2.38	0.4	1.6	2.9	
	NP-TPGB110302FS3	6.35	3.18	0.2	1.5	3.4	
	NP-TPGB110304FS3	6.35	3.18	0.4	1.6	3.4	
	NP-TPGB110308FS3	6.35	3.18	0.8	1.7	3.4	
	NP-TPGB160304FS3	9.525	3.18	0.4	1.6	4.4	
	NP-TPGB160308FS3	9.525	3.18	0.8	1.7	4.4	
	NP-TPGB080204GS3	4.76	2.38	0.4	1.6	2.4	
	NP-TPGB080208GS3	4.76	2.38	0.8	1.7	2.4	
	NP-TPGB090202GS3	5.56	2.38	0.2	1.5	2.9	
	NP-TPGB090204GS3	5.56	2.38	0.4	1.6	2.9	
	NP-TPGB090208GS3	5.56	2.38	0.8	1.7	2.9	
	NP-TPGB110302GS3	6.35	3.18	0.2	1.5	3.4	
	NP-TPGB110304GS3	6.35	3.18	0.4	1.6	3.4	
	NP-TPGB110308GS3	6.35	3.18	0.8	1.7	3.4	
	NP-TPGB160304GS3	9.525	3.18	0.4	1.6	4.4	
	NP-TPGB160308GS3	9.525	3.18	0.8	1.7	4.4	
	NP-TPGB080204GA3	4.76	2.38	0.4	1.6	2.4	
	NP-TPGB080208GA3	4.76	2.38	0.8	1.7	2.4	
	NP-TPGB090204GA3	5.56	2.38	0.4	1.6	2.9	
	NP-TPGB090208GA3	5.56	2.38	0.8	1.7	2.9	
	NP-TPGB110302GA3	6.35	3.18	0.2	1.5	3.4	
	NP-TPGB110304GA3	6.35	3.18	0.4	1.6	3.4	
	NP-TPGB110308GA3	6.35	3.18	0.8	1.7	3.4	
	NP-TPGB160304GA3	9.525	3.18	0.4	1.6	4.4	
	NP-TPGB160308GA3	9.525	3.18	0.8	1.7	4.4	
	NP-TPGB160304GH3	9.525	3.18	0.4	1.6	4.4	
	NP-TPGB160308GH3	9.525	3.18	0.8	1.7	4.4	
	NEW NP-TPGB110304VA3	6.35	3.18	0.4	1.6	3.4	
	NEW NP-TPGB110308VA3	6.35	3.18	0.8	1.7	3.4	
	NP-TPGB080204TA3	4.76	2.38	0.4	1.6	2.4	
	NP-TPGB080208TA3	4.76	2.38	0.8	1.7	2.4	
	NP-TPGB090204TA3	5.56	2.38	0.4	1.6	2.9	
	NP-TPGB090208TA3	5.56	2.38	0.8	1.7	2.9	
	NP-TPGB110304TA3	6.35	3.18	0.4	1.6	3.4	
	NP-TPGB110308TA3	6.35	3.18	0.8	1.7	3.4	
	NP-TPGB160304TA3	9.525	3.18	0.4	1.6	4.4	
	NP-TPGB160308TA3	9.525	3.18	0.8	1.7	4.4	
	NP-TPGB160304TH3	9.525	3.18	0.4	1.6	4.4	
	NP-TPGB160308TH3	9.525	3.18	0.8	1.7	4.4	





● = NEW

60° TP TYPE INSERTS WITH HOLE

Workpiece Material			Coated CBN							CBN						Cutting Conditions (Guide) : ●: Stable Cutting ◐: General Cutting ✲: Unstable Cutting
	H	Hardened Materials	●	◐	●	●	◐	✲		●	◐	✲				Honing (Last letter of order number) : Refer to page B009.
	K	Cast Iron							●				◐	●	◐	
	S	Heat Resistant Alloy, Titanium Alloy													●	
		Sintered Alloy											◐			

Shape	Order Number	Coated CBN							CBN						Dimensions (mm)					Geometry
		NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730	IC	S	RE	LE	D1	
NEW PETIT CUT	NP-TPGB090202SF3											●			5.56	2.38	0.2	1.5	2.9	EPSR 60° RE D1 AN 11° LE IC S
	NP-TPGB090204SF3											●			5.56	2.38	0.4	1.6	2.9	
	NP-TPGB110302SF3											●			6.35	3.18	0.2	1.5	3.4	
	NP-TPGB110304SF3											●			6.35	3.18	0.4	1.6	3.4	
	NP-TPGB110308SF3											●			6.35	3.18	0.8	1.7	3.4	
	NP-TPGB090202SE3											●			5.56	2.38	0.2	1.5	2.9	
	NP-TPGB090204SE3											●			5.56	2.38	0.4	1.6	2.9	
	NP-TPGB110302SE3											●			6.35	3.18	0.2	1.5	3.4	
	NP-TPGB110304SE3											●			6.35	3.18	0.4	1.6	3.4	
	NP-TPGB110308SE3											●			6.35	3.18	0.8	1.7	3.4	
NEW PETIT CUT	NP-TPGX110304F												▲		6.35	3.18	0.4	1.6	3.5	EPSR 60° LE RE D1 AN 11° IC S
	NP-TPGX110308F												▲		6.35	3.18	0.8	1.7	3.5	
	NP-TPGX110304T													▲	6.35	3.18	0.4	1.6	3.5	
	NP-TPGX110308T													▲	6.35	3.18	0.8	1.7	3.5	
	TPGX080202												▲	▲	4.76	2.38	0.2	1.8	2.5	EPSR 60° LE RE D1 AN 11° IC S
	TPGX080204												▲	▲	4.76	2.38	0.4	1.7	2.5	
	TPGX080208												□	□	4.76	2.38	0.8	1.4	2.5	
	TPGX090202												▲	▲	5.56	2.38	0.2	2.7	3.0	
	TPGX090204												▲	▲	5.56	2.38	0.4	2.6	3.0	
	TPGX090208												□	□	5.56	2.38	0.8	2.3	3.0	
	TPGX110302												□	□	6.35	3.18	0.2	2.7	3.5	TPGX16○○○○ EPSR 60° LE RE D1 AN 11° IC S
	TPGX110304												▲	▲	6.35	3.18	0.4	2.6	3.5	
	TPGX110308												▲	▲	6.35	3.18	0.8	2.3	3.5	
	TPGX160304												▲	□	9.525	3.18	0.4	3.6	4.8	
	TPGX160308												▲	□	9.525	3.18	0.8	3.3	4.8	
	TPGX160404												□	□	9.525	4.76	0.4	3.6	4.8	
	TPGX160408												□	□	9.525	4.76	0.8	3.3	4.8	

● = NEW

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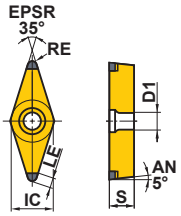
□ : If you purchase a produced-to-order product, the minimum number of lots is 10. (Contains one insert per case.)

35° VB TYPE INSERTS WITH HOLE

Workpiece Material			Coated CBN							CBN						Dimensions (mm)					Geometry
			NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730	IC	S	RE	LE	D1	
Shape	Order Number																				
NEW PETIT CUT	NP-VBGW110302FS2		●			▲				●						6.35	3.18	0.2	2.5	2.85	
	NP-VBGW110304FS2		●			▲				●			●			6.35	3.18	0.4	2.5	2.85	
	NP-VBGW110308FS2		●			▲				●			●			6.35	3.18	0.8	2.0	2.85	
	NP-VBGW160402FS2		●			▲				●						9.525	4.76	0.2	2.5	4.43	
	NP-VBGW160404FS2						▲						●			9.525	4.76	0.4	2.5	4.43	
	NP-VBGW160408FS2						▲						●			9.525	4.76	0.8	2.0	4.43	
	NP-VBGW110302GS2		●		●	▲										6.35	3.18	0.2	2.5	2.85	
	NP-VBGW110304GS2		●		●	▲							●		▲	6.35	3.18	0.4	2.5	2.85	
	NP-VBGW110308GS2		●		●	▲							●		▲	6.35	3.18	0.8	2.0	2.85	
	NP-VBGW160402GS2		●		●	▲										9.525	4.76	0.2	2.5	4.43	
	NP-VBGW160404GS2		●		●	▲			●				●	▲	▲	9.525	4.76	0.4	2.5	4.43	
	NP-VBGW160408GS2		●		●	▲			●				●	▲	▲	9.525	4.76	0.8	2.0	4.43	
	NP-VBGW110302GA2			●			▲				●					6.35	3.18	0.2	2.5	2.85	
	NP-VBGW110304GA2			●			▲	●			●					6.35	3.18	0.4	2.5	2.85	
	NP-VBGW110308GA2			●			▲	●			●					6.35	3.18	0.8	2.0	2.85	
	NP-VBGW160402GA2			●			▲				●					9.525	4.76	0.2	2.5	4.43	
	NP-VBGW160404GA2			●			▲	●			●					9.525	4.76	0.4	2.5	4.43	
	NP-VBGW160408GA2			●			▲	●			●					9.525	4.76	0.8	2.0	4.43	
	NP-VBGW160404GH2					▲	▲	●								9.525	4.76	0.4	2.5	4.43	
	NP-VBGW160408GH2					▲	▲	●								9.525	4.76	0.8	2.0	4.43	
	NEW NP-VBGW160404VA2			●												9.525	4.76	0.4	2.5	4.43	
	NEW NP-VBGW160408VA2			●												9.525	4.76	0.8	2.0	4.43	
	NP-VBGW110304TA2							●								6.35	3.18	0.4	2.5	2.85	
	NP-VBGW110308TA2							●								6.35	3.18	0.8	2.0	2.85	
	NP-VBGW160404TA2			●			▲	●			●					9.525	4.76	0.4	2.5	4.43	
	NP-VBGW160408TA2			●			▲	●			●					9.525	4.76	0.8	2.0	4.43	
	NP-VBGW160404TH2						▲	●								9.525	4.76	0.4	2.5	4.43	
	NP-VBGW160408TH2						▲	●								9.525	4.76	0.8	2.0	4.43	
	NP-VBGW110304SF2												●			6.35	3.18	0.4	2.5	2.85	
	NP-VBGW110308SF2												●			6.35	3.18	0.8	2.0	2.85	
	NP-VBGW160404SF2												●			9.525	4.76	0.4	2.5	4.43	
	NP-VBGW160408SF2												●			9.525	4.76	0.8	2.0	4.43	
	NP-VBGW110304SE2												●			6.35	3.18	0.4	2.5	2.85	
	NP-VBGW110308SE2												●			6.35	3.18	0.8	2.0	2.85	
	NP-VBGW160404SE2												●			9.525	4.76	0.4	2.5	4.43	
	NP-VBGW160408SE2												●			9.525	4.76	0.8	2.0	4.43	



Workpiece Material		
	H	Hardened Materials
	K	Cast Iron
	S	Heat Resistant Alloy, Titanium Alloy
		Sintered Alloy

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✠ : Unstable Cutting

Honing (Last letter of order number) : Refer to page B009.

● = NEW

35° VC TYPE INSERTS WITH HOLE

Workpiece Material			BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730
	H	Hardened Materials	●	◐	●	●	◐	✣		●	◐	✣			
	K	Cast Iron							●				◐	●	◐
	S	Heat Resistant Alloy, Titanium Alloy													●
		Sintered Alloy											◐		

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting

Honing (Last letter of order number) : Refer to page B009.

Shape	Order Number	Coated CBN							CBN						Dimensions (mm)					Geometry
		NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730	IC	S	RE	LE	D1	
NEW PETIT CUT	NP-VCGW160404FS2				▲	▲			●						9.525	4.76	0.4	2.5	4.4	EPSR 35° RE LE IC D1 AN 7° S
	NP-VCGW160408FS2				▲	▲			●						9.525	4.76	0.8	2.0	4.4	
	NP-VCGW160404GS2	●		●	▲										9.525	4.76	0.4	2.5	4.4	
	NP-VCGW160408GS2	●		●	▲										9.525	4.76	0.8	2.0	4.4	
	NP-VCGW160404GA2		●			▲	●								9.525	4.76	0.4	2.5	4.4	
	NP-VCGW160408GA2		●			▲	●								9.525	4.76	0.8	2.0	4.4	
	NP-VCGW160404GH2				▲	▲	●								9.525	4.76	0.4	2.5	4.4	
	NP-VCGW160408GH2				▲	▲	●								9.525	4.76	0.8	2.0	4.4	
	NEW NP-VCGW160404VA2		●												9.525	4.76	0.4	2.5	4.4	
	NEW NP-VCGW160408VA2		●												9.525	4.76	0.8	2.0	4.4	
	NP-VCGW160404TS2				▲										9.525	4.76	0.4	2.5	4.4	
	NP-VCGW160408TS2				▲										9.525	4.76	0.8	2.0	4.4	
	NP-VCGW160404TA2		●			▲	●								9.525	4.76	0.4	2.5	4.4	
	NP-VCGW160408TA2		●			▲	●								9.525	4.76	0.8	2.0	4.4	
	NP-VCGW160404TH2					▲	●								9.525	4.76	0.4	2.5	4.4	
	NP-VCGW160408TH2					▲	●								9.525	4.76	0.8	2.0	4.4	

● = NEW

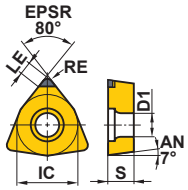
● : Inventory maintained in Japan. ▲ : Inventory maintained in Japan. To be replaced by new products.
(Contains one insert per case.)

80° WC TYPE INSERTS WITH HOLE

Workpiece Material			BC6210 NEW	BC6220	BC8105	BC8110	BC8120	BC8130	BC5110 NEW	MB8110	MB8120	MB8130	MB4120	MB710	MB730
	H	Hardened Materials	●	◐	●	●	◐	✣		●	◐	✣			
	K	Cast Iron							●				◐	●	◐
	S	Heat Resistant Alloy, Titanium Alloy													●
		Sintered Alloy											◐		

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting

Honing (Last letter of order number) : Refer to page B009.

Shape	Order Number	IC	S	RE	LE	D1	Geometry
	**NP-WCMWL30204FA**	4.76	2.38	0.4	1.8	2.3	
	NP-WCMWL30208FA	4.76	2.38	0.8	1.9	2.3	

● = NEW

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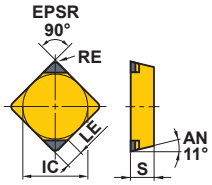
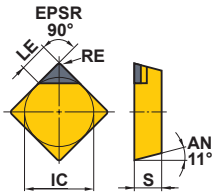
EXTERNAL TURNING	➤ C002—C005	GRADES	➤ B006
BORING	➤ E002—E005	IDENTIFICATION	➤ B002
SMALL TOOLS	➤ D013		

90° SP TYPE INSERTS WITHOUT HOLE

Workpiece Material			BC8210 NEW	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110 NEW	MB8110	MB8120	MB8130	MB4120	MB710	MB730
	H	Hardened Materials	●	◐	●	●	◐	✲		●	◐	✲			
	K	Cast Iron							●				◐	●	◐
	S	Heat Resistant Alloy, Titanium Alloy													●
		Sintered Alloy											◐		

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✲ : Unstable Cutting

Shape	Order Number	Coated CBN							CBN						Dimensions (mm)				Geometry
		BC8210 NEW	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110 NEW	MB8110	MB8120	MB8130	MB4120	MB710	MB730	IC	S	RE	LE	
NEW PETIT CUT NEW 	NP-SPGN120412GS2							●							12.7	4.76	1.2	2.5	
	SPGN090302												□	□	9.525	3.18	0.2	4.0	
	SPGN090304												▲	□	9.525	3.18	0.4	4.0	
	SPGN090308												▲	□	9.525	3.18	0.8	4.1	
	SPGN090312												□	□	9.525	3.18	1.2	4.0	
	SPGN120304												▲	▲	12.7	3.18	0.4	4.0	
	SPGN120308												▲	▲	12.7	3.18	0.8	4.1	
	SPGN120312												□	□	12.7	3.18	1.2	4.0	
	SPGN120408												□	□	12.7	4.76	0.8	4.1	
	SPGN120412												□	□	12.7	4.76	1.2	4.0	

● = NEW

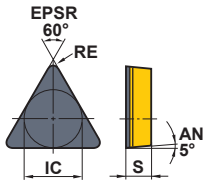
● : Inventory maintained in Japan. □ : Non stock, produced to order only.
▲ : Inventory maintained in Japan. To be replaced by new products.

□ : If you purchase a produced-to-order product, the minimum number of lots is 10. (Contains one insert per case.)

60° TB TYPE INSERTS WITHOUT HOLE

Workpiece Material			BC8210 NEW	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110 NEW	MB8110	MB8120	MB8130	MB4120	MB710	MB730
	H	Hardened Materials	●	◐	●	●	◐	✲		●	◐	✲			
	K	Cast Iron							●				◐	●	◐
	S	Heat Resistant Alloy, Titanium Alloy													●
		Sintered Alloy											◐		

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✲ : Unstable Cutting

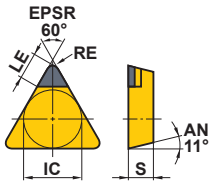
Shape	Order Number	IC	S	RE	LE	Geometry
	**TBGN060104**	3.97	1.59	0.4	—	
	TBGN060108	3.97	1.59	0.8	—	

▲ = NEW

60° TP TYPE INSERTS WITHOUT HOLE

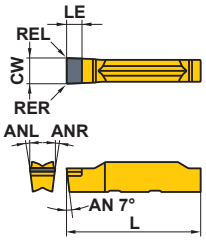
Workpiece Material			BC8210 NEW	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110 NEW	MB8110	MB8120	MB8130	MB4120	MB710	MB730
	H	Hardened Materials	●	◐	●	●	◐	✲		●	◐	✲			
	K	Cast Iron							●				◐	●	◐
	S	Heat Resistant Alloy, Titanium Alloy													●
		Sintered Alloy											◐		

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✲ : Unstable Cutting

Shape	Order Number	IC	S	RE	LE	Geometry
	**TPGN090204**	5.56	2.38	0.4	2.6	
	TPGN110302	6.35	3.18	0.2	2.7	
	TPGN110304	6.35	3.18	0.4	2.6	
	TPGN110308	6.35	3.18	0.8	2.3	
	TPGN160304	9.525	3.18	0.4	3.6	
	TPGN160308	9.525	3.18	0.8	3.3	
	TPGN160312	9.525	3.18	1.2	3.0	
	TPGN160408	9.525	4.76	0.8	3.3	
	TPGN220408	12.7	4.76	0.8	3.3	

▲ = NEW

GY TYPE INSERTS WITHOUT HOLE

Workpiece Material			Coated CBN							CBN						Dimensions (mm)					Shape	Geometry
			NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730	CW	RER REL	L	LE	ANR ANL		
	H	Hardened Materials	●	◐	●	●	◐	✣		●	◐	✣										
	K	Cast Iron							●				◐	●	◐							
	S	Heat Resistant Alloy, Titanium Alloy													●							
		Sintered Alloy											◐									
	GY1G0200D020N-GFGS				▲											2.00	0.2	20.7	2.7	3°		
	GY1G0239E020N-GFGS				▲											2.39	0.2	20.7	2.7	7°		
	GY1G0250E020N-GFGS				▲											2.50	0.2	20.7	2.7	7°		
	GY1G0300F020N-GFGS				▲											3.00	0.2	20.7	2.7	7°		
	GY1G0318F020N-GFGS				▲											3.18	0.2	20.7	2.7	7°		
	GY1G0400G020N-GFGS				▲											4.00	0.2	25.65	2.7	7°		
	GY1G0475H020N-GFGS				▲											4.75	0.2	25.65	2.7	7°		
	GY1G0500H020N-GFGS				▲											5.00	0.2	25.65	2.7	7°		
	GY1G0600J020N-GFGS				▲											6.00	0.2	25.65	2.7	7°		

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting

● = NEW

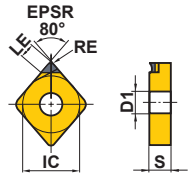
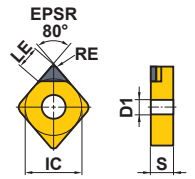
● : Inventory maintained in Japan. □ : Non stock, produced to order only.
▲ : Inventory maintained in Japan. To be replaced by new products.

□ : If you purchase a produced-to-order product, the minimum number of lots is 10. (Contains one insert per case.)

80° CN TYPE INSERTS WITH HOLE

Workpiece Material	N	Non-ferrous Metal	●

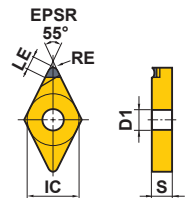
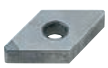
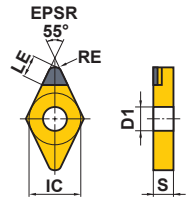
Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✥ : Unstable Cutting

Shape	Order Number	PCD MD220	Dimensions (mm) IC	S	RE	LE	D1	Geometry
NEW PETIT CUT	NP-CNMM120402R-F	●	12.7	4.76	0.2	1.7	5.16	
	NP-CNMM120402L-F	□	12.7	4.76	0.2	1.7	5.16	
	NP-CNMM120404R-F	●	12.7	4.76	0.4	1.8	5.16	
	NP-CNMM120404L-F	□	12.7	4.76	0.4	1.8	5.16	
	NP-CNMM120408R-F	●	12.7	4.76	0.8	2.0	5.16	
	NP-CNMM120408L-F	□	12.7	4.76	0.8	2.0	5.16	
(With Breaker)								Right hand insert shown.
	CNMA120404	●	12.7	4.76	0.4	3.6	5.16	
	CNMA120408	●	12.7	4.76	0.8	3.6	5.16	

55° DN TYPE INSERTS WITH HOLE

Workpiece Material	N	Non-ferrous Metal	●

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✥ : Unstable Cutting

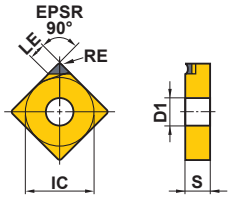
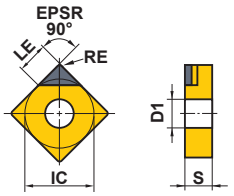
Shape	Order Number	PCD MD220	Dimensions (mm) IC	S	RE	LE	D1	Geometry
NEW PETIT CUT	NP-DNMM150402R-F	●	12.7	4.76	0.2	2.2	5.16	
	NP-DNMM150402L-F	□	12.7	4.76	0.2	2.2	5.16	
	NP-DNMM150404R-F	●	12.7	4.76	0.4	2.1	5.16	
	NP-DNMM150404L-F	□	12.7	4.76	0.4	2.1	5.16	
	NP-DNMM150408R-F	●	12.7	4.76	0.8	2.0	5.16	
	NP-DNMM150408L-F	□	12.7	4.76	0.8	2.0	5.16	
(With Breaker)								Right hand insert shown.
	DNGA150404	●	12.7	4.76	0.4	2.9	5.16	
	DNGA150408	●	12.7	4.76	0.8	2.4	5.16	

PCD TURNING INSERTS [NEGATIVE]

90° SN TYPE INSERTS WITH HOLE

Workpiece Material	N	Non-ferrous Metal	●

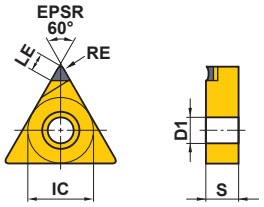
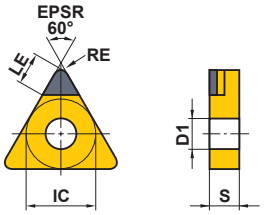
Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting

Shape	Order Number	PCD MD220	Dimensions (mm) IC	S	RE	LE	D1	Geometry
NEW PETIT CUT	NP-SNMM120404R-F	●	12.7	4.76	0.4	2.0	5.16	
	NP-SNMM120404L-F	□	12.7	4.76	0.4	2.0	5.16	
	NP-SNMM120408R-F	●	12.7	4.76	0.8	2.2	5.16	
	NP-SNMM120408L-F	□	12.7	4.76	0.8	2.2	5.16	
 (With Breaker)								 Right hand insert shown.
	SNGA120404	□	12.7	4.76	0.4	3.7	5.16	
	SNGA120408	●	12.7	4.76	0.8	3.8	5.16	
								

60° TN TYPE INSERTS WITH HOLE

Workpiece Material	N	Non-ferrous Metal	●

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting

Shape	Order Number	PCD MD220	Dimensions (mm) IC	S	RE	LE	D1	Geometry
NEW PETIT CUT	NP-TNMM160402R-F	●	9.525	4.76	0.2	1.5	3.81	
	NP-TNMM160402L-F	□	9.525	4.76	0.2	1.5	3.81	
	NP-TNMM160404R-F	●	9.525	4.76	0.4	1.6	3.81	
	NP-TNMM160404L-F	□	9.525	4.76	0.4	1.6	3.81	
	NP-TNMM160408R-F	●	9.525	4.76	0.8	1.7	3.81	
	NP-TNMM160408L-F	□	9.525	4.76	0.8	1.7	3.81	
 (With Breaker)								 Right hand insert shown.
	TNGA160402	●	9.525	4.76	0.2	3.1	3.81	
	TNGA160404	●	9.525	4.76	0.4	2.9	3.81	
	TNGA160408	●	9.525	4.76	0.8	2.8	3.81	
								

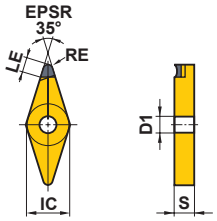
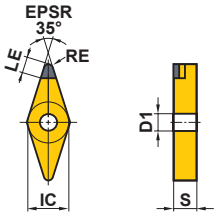
● : Inventory maintained in Japan. □ : Non stock, produced to order only.

□ : If you purchase a produced-to-order product, the minimum number of lots is 10. (Contains one insert per case.)

35° VN TYPE INSERTS WITH HOLE

Workpiece Material	N	Non-ferrous Metal	●

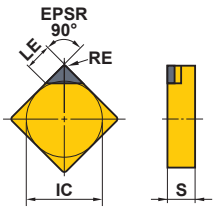
Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting

Shape	Order Number	PCD	Dimensions (mm)					Geometry
		MD220	IC	S	RE	LE	D1	
NEW PETIT CUT	NP-VNMM160402R-F	●	9.525	4.76	0.2	2.5	3.81	
	NP-VNMM160402L-F	□	9.525	4.76	0.2	2.5	3.81	
	NP-VNMM160404R-F	●	9.525	4.76	0.4	2.5	3.81	
	NP-VNMM160404L-F	□	9.525	4.76	0.4	2.5	3.81	
	NP-VNMM160408R-F	●	9.525	4.76	0.8	2.0	3.81	
	NP-VNMM160408L-F	□	9.525	4.76	0.8	2.0	3.81	
(With Breaker)								Right hand insert shown.
	VNGA160404	●	9.525	4.76	0.4	2.6	3.81	
	VNGA160408	●	9.525	4.76	0.8	1.8	3.81	
								

90° SN TYPE INSERTS WITHOUT HOLE

Workpiece Material				
	N	Non-ferrous Metal	●	

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting

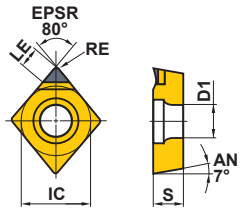
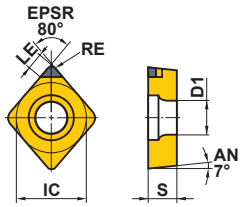
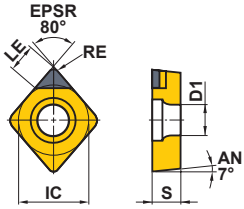
Shape	Order Number	PCD MD220	Dimensions (mm) IC	S	RE	LE	Geometry
	**SNGN120404**	□	12.7	4.76	0.4	3.7	
	SNGN120408	●	12.7	4.76	0.8	3.8	

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

□ : If you purchase a produced-to-order product, the minimum number of lots is 10. (Contains one insert per case.)

80° CC TYPE INSERTS WITH HOLE

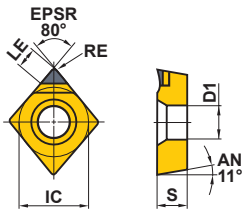
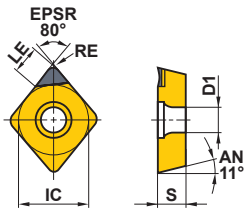
Workpiece Material				Cutting Conditions (Guide) : ● : Stable Cutting ◐ : General Cutting ✥ : Unstable Cutting
	N	Non-ferrous Metal	●	

Shape	Order Number		PCD MD220	Dimensions (mm) IC	S	RE	LE	D1	Geometry
NEW PETIT CUT		NP-CCMH060202	●	6.35	2.38	0.2	1.7	2.8	
		NP-CCMH060204	●	6.35	2.38	0.4	1.8	2.8	
 (With Breaker)									
NEW PETIT CUT	*	NP-CCMW03S102	●	3.57	1.39	0.2	1.1	2.0	
	*	NP-CCMW03S104	●	3.57	1.39	0.4	1.0	2.0	
	*	NP-CCMW04T002	●	4.37	1.79	0.2	1.5	2.4	
	*	NP-CCMW04T004	●	4.37	1.79	0.4	1.4	2.4	
		CCMW060202	●	6.35	2.38	0.2	2.9	2.8	
		CCMW060204	●	6.35	2.38	0.4	2.9	2.8	
		CCMW09T302	●	9.525	3.97	0.2	3.3	4.4	
		CCMW09T304	●	9.525	3.97	0.4	3.3	4.4	

* Diameter of inscribed circle is special. (For SCLC type)

80° CP TYPE INSERTS WITH HOLE

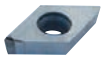
Workpiece Material				Cutting Conditions (Guide) : ● : Stable Cutting ◐ : General Cutting ✥ : Unstable Cutting
	N	Non-ferrous Metal	●	

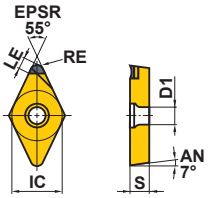
Shape	Order Number	PCD MD220	Dimensions (mm) IC	S	RE	LE	D1	Geometry
NEW PETIT CUT	NP-CPMH080202	●	7.94	2.38	0.2	1.7	3.5	
	NP-CPMH080204	●	7.94	2.38	0.4	1.8	3.5	
	NP-CPMH090302	●	9.525	3.18	0.2	1.7	4.5	
	NP-CPMH090304	●	9.525	3.18	0.4	1.8	4.5	
 (With Breaker)								
	CPGT080202	●	7.94	2.38	0.2	3.7	3.4	
	CPGT080204	●	7.94	2.38	0.4	3.6	3.4	
	CPGT090302	●	9.525	3.18	0.2	3.3	4.4	
	CPGT090304	●	9.525	3.18	0.4	3.3	4.4	
 (With Breaker)								

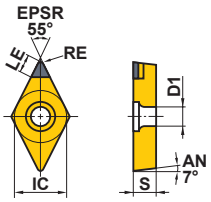
55° DC TYPE INSERTS WITH HOLE

Workpiece Material				Cutting Conditions (Guide) : ● : Stable Cutting ◐ : General Cutting ✥ : Unstable Cutting
	N	Non-ferrous Metal	●	

Shape	Order Number	PCD MD220	IC	S	RE	LE	D1	Geometry
NEW PETIT CUT	NP-DCMT070202R-F	●	6.35	2.38	0.2	1.4	2.8	
	NP-DCMT070202L-F	●	6.35	2.38	0.2	1.4	2.8	
	NP-DCMT070204R-F	●	6.35	2.38	0.4	1.5	2.8	
	NP-DCMT070204L-F	●	6.35	2.38	0.4	1.5	2.8	
	NP-DCMT11T302R-F	●	9.525	3.97	0.2	1.4	4.4	
	NP-DCMT11T302L-F	●	9.525	3.97	0.2	1.4	4.4	
	NP-DCMT11T304R-F	●	9.525	3.97	0.4	1.5	4.4	
(With Breaker)	NP-DCMT11T304L-F	●	9.525	3.97	0.4	1.5	4.4	Left hand insert shown.
	DCMW070202	●	6.35	2.38	0.2	2.7	2.8	
	DCMW070204	●	6.35	2.38	0.4	2.5	2.8	
	DCMW11T302	●	9.525	3.97	0.2	3.0	4.4	
	DCMW11T304	●	9.525	3.97	0.4	2.9	4.4	



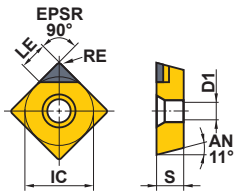




90° SP TYPE INSERTS WITH HOLE

Workpiece Material				Cutting Conditions (Guide) : ● : Stable Cutting ◐ : General Cutting ✥ : Unstable Cutting
	N	Non-ferrous Metal	●	

Shape	Order Number	PCD MD220	IC	S	RE	LE	D1	Geometry
	SPGX090304	●	9.525	3.18	0.4	3.7	4.8	
	SPGX090308	●	9.525	3.18	0.8	3.8	4.8	

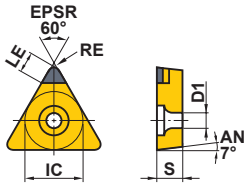
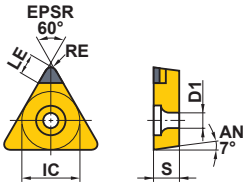


● : Inventory maintained in Japan.
(Contains one insert per case.)

60° TC TYPE INSERTS WITH HOLE

Workpiece Material	N	Non-ferrous Metal	●

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting

Shape	Order Number	PCD MD220	Dimensions (mm) IC	S	RE	LE	D1	Geometry
	**TCMW110202**	●	6.35	2.38	0.2	2.7	2.8	
	TCMW110204	●	6.35	2.38	0.4	2.6	2.8	
	**TCGW060102**	●	3.97	1.59	0.2	1.5	2.3	
	TCGW060104	●	3.97	1.59	0.4	1.6	2.3	
	TCGW060108	●	3.97	1.59	0.8	1.4	2.3	

60° TP TYPE INSERTS WITH HOLE

Workpiece Material	N	Non-ferrous Metal	●

Cutting Conditions (Guide) : ● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting

Shape	Order Number	PCD MD220	Dimensions (mm) IC	S	RE	LE	D1	Geometry
NEW PETIT CUT	NP-TPMX090202R-F	●	5.56	2.38	0.2	1.5	3.0	
	NP-TPMX090202L-F	●	5.56	2.38	0.2	1.5	3.0	
	NP-TPMX090204R-F	□	5.56	2.38	0.4	1.6	3.0	
	NP-TPMX090204L-F	●	5.56	2.38	0.4	1.6	3.0	
	NP-TPMX090208R-F	□	5.56	2.38	0.8	1.7	3.0	
	NP-TPMX090208L-F	●	5.56	2.38	0.8	1.7	3.0	
	NP-TPMX110302R-F	□	6.35	3.18	0.2	1.5	3.5	
	NP-TPMX110302L-F	●	6.35	3.18	0.2	1.5	3.5	
	NP-TPMX110304R-F	□	6.35	3.18	0.4	1.6	3.5	
	NP-TPMX110304L-F	●	6.35	3.18	0.4	1.6	3.5	
	NP-TPMX110308R-F	□	6.35	3.18	0.8	1.7	3.5	NP-TPMX16□□□□R/L-F
	NP-TPMX110308L-F	●	6.35	3.18	0.8	1.7	3.5	
	NP-TPMX160302R-F	□	9.525	3.18	0.2	1.5	4.8	
	NP-TPMX160302L-F	●	9.525	3.18	0.2	1.5	4.8	
	NP-TPMX160304R-F	□	9.525	3.18	0.4	1.6	4.8	
	NP-TPMX160304L-F	●	9.525	3.18	0.4	1.6	4.8	
	NP-TPMX160308R-F	□	9.525	3.18	0.8	1.7	4.8	
(With Breaker)	NP-TPMX160308L-F	●	9.525	3.18	0.8	1.7	4.8	Right hand insert shown.
NEW PETIT CUT	NP-TPMH080202R-F	●	4.76	2.38	0.2	1.5	2.4	
	NP-TPMH080202L-F	●	4.76	2.38	0.2	1.5	2.4	
	NP-TPMH080204R-F	●	4.76	2.38	0.4	1.6	2.4	
	NP-TPMH080204L-F	●	4.76	2.38	0.4	1.6	2.4	
	NP-TPMH090202R-F	●	5.56	2.38	0.2	1.5	2.9	
	NP-TPMH090202L-F	●	5.56	2.38	0.2	1.5	2.9	
	NP-TPMH090204R-F	●	5.56	2.38	0.4	1.6	2.9	
	NP-TPMH090204L-F	●	5.56	2.38	0.4	1.6	2.9	
	NP-TPMH110302R-F	●	6.35	3.18	0.2	1.5	3.4	
	NP-TPMH110302L-F	●	6.35	3.18	0.2	1.5	3.4	
	NP-TPMH110304R-F	●	6.35	3.18	0.4	1.6	3.4	
	NP-TPMH110304L-F	●	6.35	3.18	0.4	1.6	3.4	
	NP-TPMH160302R-F	●	9.525	3.18	0.2	1.5	4.4	
	NP-TPMH160302L-F	●	9.525	3.18	0.2	1.5	4.4	
	NP-TPMH160304R-F	●	9.525	3.18	0.4	1.6	4.4	
(With Breaker)	NP-TPMH160304L-F	●	9.525	3.18	0.4	1.6	4.4	Left hand insert shown.
	TPGT160302R-F	●	9.525	3.18	0.2	3.1	4.4	
	TPGT160302L-F	●	9.525	3.18	0.2	3.1	4.4	
	TPGT160304R-F	●	9.525	3.18	0.4	2.9	4.4	
	TPGT160304L-F	●	9.525	3.18	0.4	2.9	4.4	
(With Breaker)								Right hand insert shown.

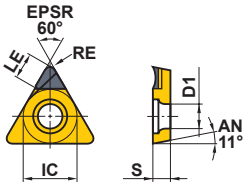
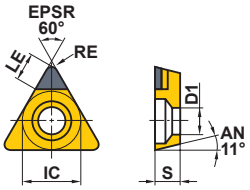
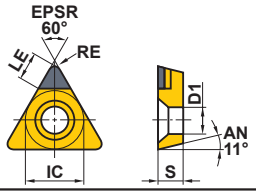
● : Inventory maintained in Japan. □ : Non stock, produced to order only.

□ : If you purchase a produced-to-order product, the minimum number of lots is 10. (Contains one insert per case.)

60° TP TYPE INSERTS WITH HOLE

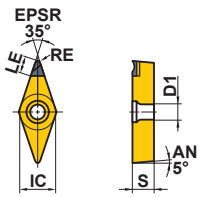
Workpiece Material	N	Non-ferrous Metal	●

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting

Shape	Order Number	PCD	Dimensions (mm)					Geometry
		MD220	IC	S	RE	LE	D1	
 (With Breaker)	TPGV090202R-F	●	5.56	2.38	0.2	2.7	2.8	 Right hand insert shown.
	TPGV090202L-F	●	5.56	2.38	0.2	2.7	2.8	
	TPGV090204R-F	●	5.56	2.38	0.4	2.6	2.8	
	TPGV090204L-F	●	5.56	2.38	0.4	2.6	2.8	
	TPGV110302R-F	●	6.35	3.18	0.2	2.7	3.4	
	TPGV110302L-F	●	6.35	3.18	0.2	2.7	3.4	
	TPGV110304R-F	●	6.35	3.18	0.4	2.6	3.4	
	TPGV110304L-F	●	6.35	3.18	0.4	2.6	3.4	
	TPGX080202	●	4.76	2.38	0.2	1.8	2.5	 TPGX16○○○○ 
	TPGX080204	●	4.76	2.38	0.4	1.7	2.5	
	TPGX080208	●	4.76	2.38	0.8	1.4	2.5	
	TPGX090202	●	5.56	2.38	0.2	2.7	3.0	
	TPGX090204	●	5.56	2.38	0.4	2.6	3.0	
	TPGX090208	●	5.56	2.38	0.8	2.3	3.0	
	TPGX110302	●	6.35	3.18	0.2	2.7	3.5	
	TPGX110304	●	6.35	3.18	0.4	2.6	3.5	
	TPGX110308	●	6.35	3.18	0.8	2.3	3.5	
	TPGX160304	●	9.525	3.18	0.4	2.9	4.8	
	TPGX160308	●	9.525	3.18	0.8	2.6	4.8	

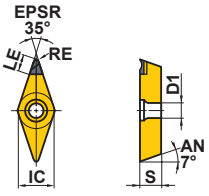
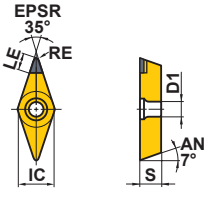
35° VB TYPE INSERTS WITH HOLE

Workpiece Material				Cutting Conditions (Guide) : ● : Stable Cutting ◐ : General Cutting ✥ : Unstable Cutting
	N	Non-ferrous Metal	●	

Shape	Order Number	PCD	Dimensions (mm)					Geometry
		MD220	IC	S	RE	LE	D1	
	NP-VBGT1103V5R-F	●	6.35	3.18	0.05	2.5	2.85	
	NP-VBGT110301R-F	●	6.35	3.18	0.1	2.5	2.85	
	NP-VBGT110302R-F	●	6.35	3.18	0.2	2.5	2.85	
	NP-VBGT110304R-F	●	6.35	3.18	0.4	2.5	2.85	
(With Breaker)								

35° VC TYPE INSERTS WITH HOLE

Workpiece Material				Cutting Conditions (Guide) : ● : Stable Cutting ◐ : General Cutting ✥ : Unstable Cutting
	N	Non-ferrous Metal	●	

Shape	Order Number	PCD	Dimensions (mm)					Geometry
		MD220	IC	S	RE	LE	D1	
	NP-VCGT0802V5R-F	●	4.76	2.38	0.05	2.5	2.4	
	NP-VCGT080201R-F	●	4.76	2.38	0.1	2.5	2.4	
	NP-VCGT080202R-F	●	4.76	2.38	0.2	2.5	2.4	
	NP-VCGT080204R-F	●	4.76	2.38	0.4	2.5	2.4	
	NP-VCGT1103V5R-F	●	6.35	3.18	0.05	2.5	2.8	
	NP-VCGT110301R-F	●	6.35	3.18	0.1	2.5	2.8	
	NP-VCGT110302R-F	●	6.35	3.18	0.2	2.5	2.8	
(With Breaker)	NP-VCGT110304R-F	●	6.35	3.18	0.4	2.5	2.8	
NEW	VCGW110301	●	6.35	3.18	0.1	3.1	2.8	
	VCGW110302	●	6.35	3.18	0.2	3.0	2.8	
	VCGW110304	●	6.35	3.18	0.4	2.6	2.8	

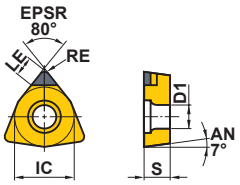
● = NEW

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

□ : If you purchase a produced-to-order product, the minimum number of lots is 10. (Contains one insert per case.)

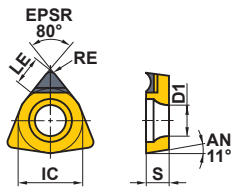
80° WC TYPE INSERTS WITH HOLE

Workpiece Material				Cutting Conditions (Guide) : ● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting
	N	Non-ferrous Metal	●	

Shape	Order Number	PCD	Dimensions (mm)					Geometry
		MD220	IC	S	RE	LE	D1	
	**WCMWL30202**	●	4.76	2.38	0.2	1.6	2.3	
	WCMWL30204	□	4.76	2.38	0.4	1.7	2.3	
	WCMW040202	●	6.35	2.38	0.2	2.9	2.8	
	WCMW040204	□	6.35	2.38	0.4	3.0	2.8	
	WCMW06T304	●	9.525	3.97	0.4	3.0	4.4	
	WCMW06T308	□	9.525	3.97	0.8	3.2	4.4	

80° WP TYPE INSERTS WITH HOLE

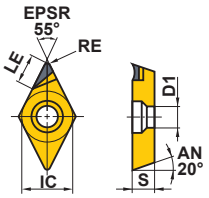
Workpiece Material				Cutting Conditions (Guide) : ● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting
	N	Non-ferrous Metal	●	

Shape	Order Number	PCD	Dimensions (mm)					Geometry
		MD220	IC	S	RE	LE	D1	
 (With Breaker)	**WPGT040202**	●	6.35	2.38	0.2	2.9	2.8	
	WPGT040204	●	6.35	2.38	0.4	2.9	2.8	
	WPGT060302	●	9.525	3.18	0.2	3.3	4.4	
	WPGT060304	●	9.525	3.18	0.4	3.3	4.4	

55° DE TYPE INSERTS WITH HOLE

Workpiece Material	N	Non-ferrous Metal	●

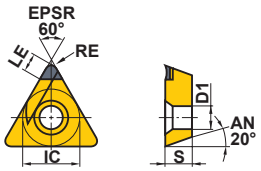
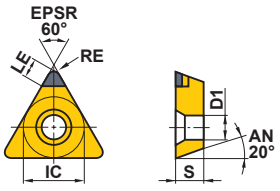
Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting

Shape	Order Number	PCD MD220	Dimensions (mm) IC	S	RE	LE	D1	Geometry
 (With Breaker)	DEGX150402R-F	●	12.7	4.76	0.2	3.0	5.1	 Right hand insert shown.
	DEGX150402L-F	●	12.7	4.76	0.2	3.0	5.1	
	DEGX150404R-F	●	12.7	4.76	0.4	2.9	5.1	
	DEGX150404L-F	●	12.7	4.76	0.4	2.9	5.1	

60° TE TYPE INSERTS WITH HOLE

Workpiece Material	N	Non-ferrous Metal	●

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting

Shape	Order Number	PCD MD220	Dimensions (mm) IC	S	RE	LE	D1	Geometry
 (With Breaker)	TEGX160302R	●	9.525	3.18	0.2	3.8	4.4	 Right hand insert shown.
	TEGX160302L	●	9.525	3.18	0.2	3.8	4.4	
	TEGX160304R	●	9.525	3.18	0.4	3.6	4.4	
	TEGX160304L	●	9.525	3.18	0.4	3.6	4.4	
	TEGX160302	●	9.525	3.18	0.2	3.1	4.4	
	TEGX160304	●	9.525	3.18	0.4	2.9	4.4	

● : Inventory maintained in Japan.
(Contains one insert per case.)

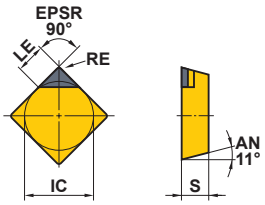
35° VD TYPE INSERTS WITH HOLE

Workpiece Material				Cutting Conditions (Guide) : ● : Stable Cutting ◐ : General Cutting ✥ : Unstable Cutting
	N	Non-ferrous Metal	●	

Shape	Order Number	PCD	Dimensions (mm)					Geometry
		MD220	IC	S	RE	LE	D1	
	VDGX160302R-F	●	9.525	3.18	0.2	3.1	4.5	EPSR 35° RE LE IC S D1 AN 15°
	VDGX160302L-F	●	9.525	3.18	0.2	3.1	4.5	
	VDGX160304R-F	●	9.525	3.18	0.4	2.7	4.5	
	VDGX160304L-F	●	9.525	3.18	0.4	2.7	4.5	
(With Breaker)								Right hand insert shown.

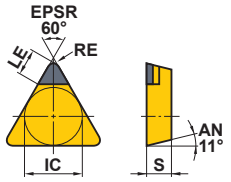
90° SP TYPE INSERTS WITHOUT HOLE

Workpiece Material				Cutting Conditions (Guide) : ● : Stable Cutting ◐ : General Cutting ✥ : Unstable Cutting
	N	Non-ferrous Metal	●	

Shape	Order Number	PCD MD220	Dimensions (mm) IC	S	RE	LE	Geometry
	SPGN090302	●	9.525	3.18	0.2	3.7	
	SPGN090304	●	9.525	3.18	0.4	3.7	
	SPGN090308	●	9.525	3.18	0.8	3.8	
	SPGN090312	□	9.525	3.18	1.2	3.7	
	SPGN120304	●	12.7	3.18	0.4	3.7	
	SPGN120308	●	12.7	3.18	0.8	3.8	
	SPGN120312	●	12.7	3.18	1.2	3.7	

60° TP TYPE INSERTS WITHOUT HOLE

Workpiece Material				Cutting Conditions (Guide) : ● : Stable Cutting ◐ : General Cutting ✥ : Unstable Cutting
	N	Non-ferrous Metal	●	

Shape	Order Number	PCD MD220	Dimensions (mm) IC	S	RE	LE	Geometry
	TPGN110302	●	6.35	3.18	0.2	2.7	
	TPGN110304	●	6.35	3.18	0.4	2.6	
	TPGN110308	●	6.35	3.18	0.8	2.3	
	TPGN160302	●	9.525	3.18	0.2	3.1	
	TPGN160304	●	9.525	3.18	0.4	2.9	
	TPGN160308	●	9.525	3.18	0.8	2.6	
	TPGN160312	□	9.525	3.18	1.2	2.4	

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

□ : If you purchase a produced-to-order product, the minimum number of lots is 10. (Contains one insert per case.)

EXTERNAL TURNING ➤ —
BORING ➤ E002—E005
GRADES ➤ B015
IDENTIFICATION ➤ B002

Memo