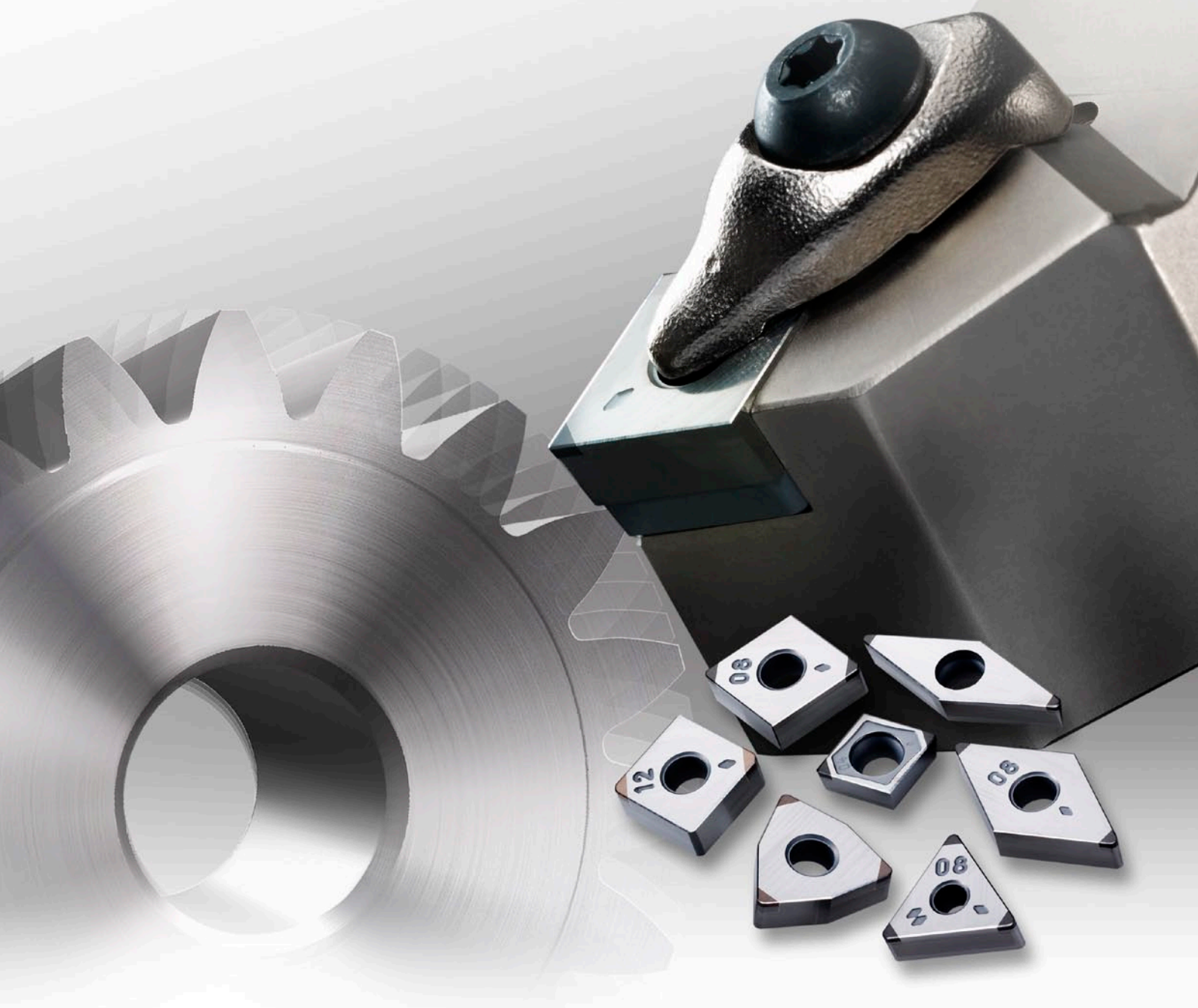


CBN Grade for Sintered Alloys and Cast Irons

MB4120New
Product

Excellent Fracture Resistance and Stable Cutting Improves Productivity



CBN Grade for Sintered Alloys and Cast Irons

MB4120

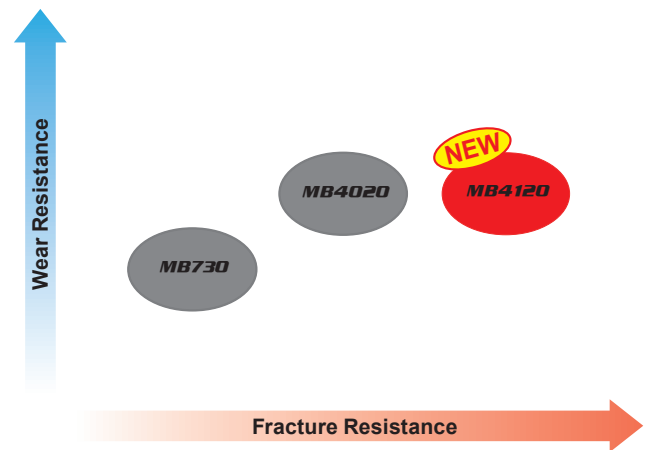
Increasing the CBN particle content and bonding strength makes it suitable for machining various sintered materials.

High Fracture Resistance

Fine CBN particles increase cutting edge toughness. The high fracture resistance allows stable performance even during interrupted machining.

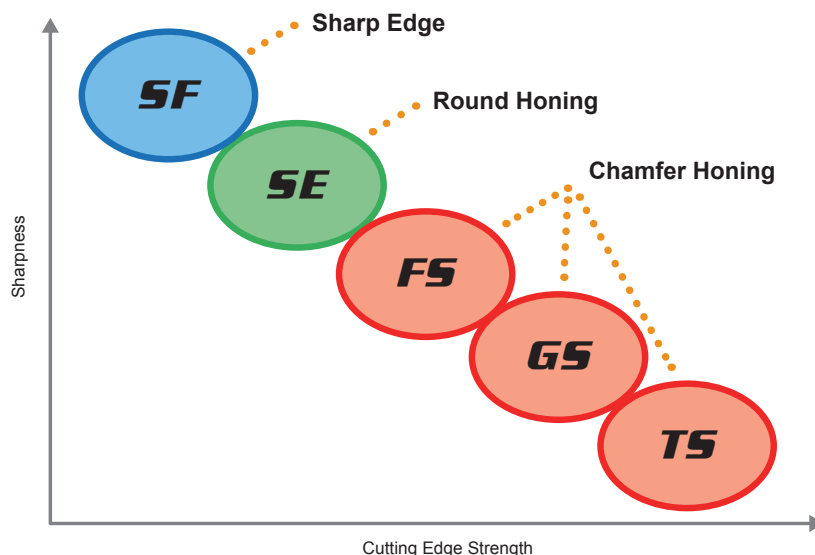
High Adhesion Strength of Fine CBN Particles

Optimization of the sintering conditions strengthens adhesion between fine CBN particles. This increases both fracture resistance and wear resistance.



A Wide Range of Edge Preparation (Honing) are Available

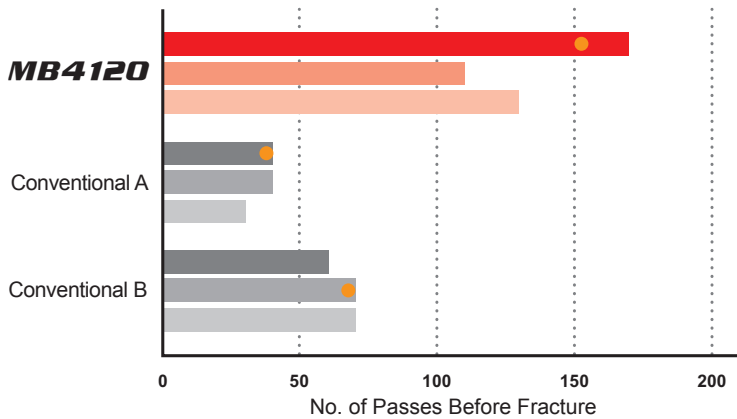
The SF type offers a sharper cutting edge, leading to the reduction in cutting resistance and burr development and an increase in surface finishes. The SF type is the first recommendation but, to increase cutting edge strength and chipping resistance there are also the SE, FS, GS and TS edge preparations.



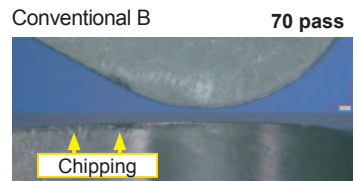
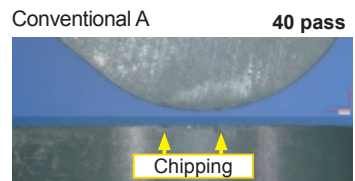
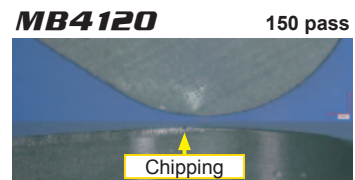
Cutting Performance

Fracture Resistance Comparison During Interrupted Facing of High Strength Sintered Alloy

Increased fracture resistance even during heavy interrupted machining.

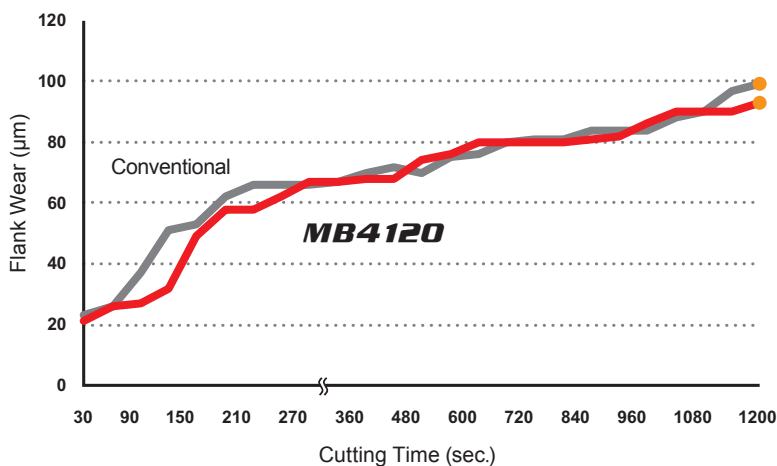


<Cutting Conditions>
 Work Material : High Strength Sintered Alloy
 Insert : NP-TNGA160408SE3
 Cutting Speed : $v_c=150$ m/min
 Feed per Rev. : $f=0.15$ mm/rev
 Depth of Cut : $a_p=0.1$ mm
 Cutting Mode : Wet Cutting

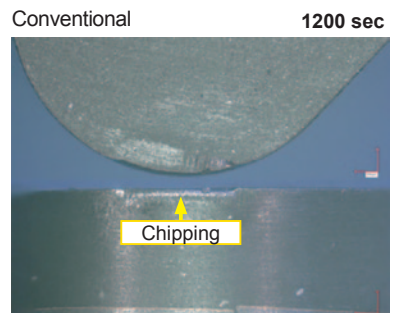
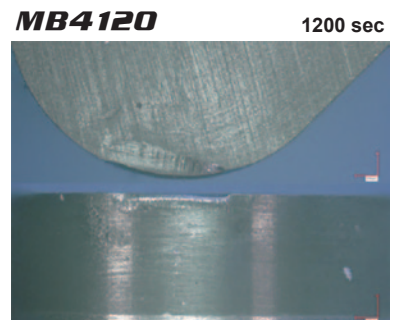


Comparison in Continuous Machining of AISI No 35 B

Excellent fracture resistance compared to conventional products.



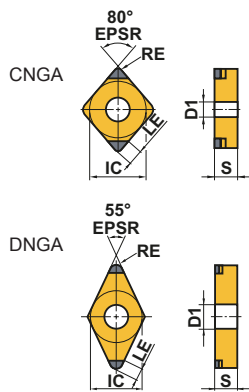
<Cutting Conditions>
 Work Material : AISI No 35 B (Pearlite)
 Insert : NP-TNGA160408SF3
 Cutting Speed : $v_c=800$ m/min
 Feed per Rev. : $f=0.1$ mm/rev
 Depth of Cut : $a_p=0.2$ mm
 Cutting Mode : Dry Cutting



CBN Grade for Sintered Alloys and Cast Irons

Negative Inserts (With Hole)

G Class



NEW PETIT CUT			
NP_002			
NEW PETIT CUT			
NP_002			

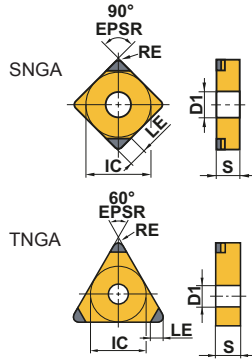
(mm)

Order Number	MB4120	Cutting Edges	IC	S	RE	D1	LE
NP-CNGA120404SF2	●	2	12.7	4.76	0.4	5.16	1.9
NP-CNGA120408SF2	●	2	12.7	4.76	0.8	5.16	2.1
NP-CNGA120412SF2	●	2	12.7	4.76	1.2	5.16	2.3
NP-CNGA120404SE2	●	2	12.7	4.76	0.4	5.16	1.9
NP-CNGA120408SE2	●	2	12.7	4.76	0.8	5.16	2.1
NP-CNGA120412SE2	●	2	12.7	4.76	1.2	5.16	2.3
NP-CNGA120404FS2	●	2	12.7	4.76	0.4	5.16	1.9
NP-CNGA120408FS2	●	2	12.7	4.76	0.8	5.16	2.1
NP-CNGA120412FS2	●	2	12.7	4.76	1.2	5.16	2.3
NP-CNGA120404GS2	●	2	12.7	4.76	0.4	5.16	1.9
NP-CNGA120408GS2	●	2	12.7	4.76	0.8	5.16	2.1
NP-CNGA120412GS2	●	2	12.7	4.76	1.2	5.16	2.3
NP-CNGA120404TS2	●	2	12.7	4.76	0.4	5.16	1.9
NP-CNGA120408TS2	●	2	12.7	4.76	0.8	5.16	2.1
NP-CNGA120412TS2	●	2	12.7	4.76	1.2	5.16	2.3
NP-DNGA150404SF2	●	2	12.7	4.76	0.4	5.16	2.1
NP-DNGA150408SF2	●	2	12.7	4.76	0.8	5.16	2.0
NP-DNGA150412SF2	●	2	12.7	4.76	1.2	5.16	1.9
NP-DNGA150604SF2	●	2	12.7	6.35	0.4	5.16	2.1
NP-DNGA150608SF2	●	2	12.7	6.35	0.8	5.16	2.0
NP-DNGA150612SF2	●	2	12.7	6.35	1.2	5.16	1.9
NP-DNGA150404SE2	●	2	12.7	4.76	0.4	5.16	2.1
NP-DNGA150408SE2	●	2	12.7	4.76	0.8	5.16	2.0
NP-DNGA150412SE2	●	2	12.7	4.76	1.2	5.16	1.9
NP-DNGA150604SE2	●	2	12.7	6.35	0.4	5.16	2.1
NP-DNGA150608SE2	●	2	12.7	6.35	0.8	5.16	2.0
NP-DNGA150612SE2	●	2	12.7	6.35	1.2	5.16	1.9
NP-DNGA150404FS2	●	2	12.7	4.76	0.4	5.16	2.1
NP-DNGA150408FS2	●	2	12.7	4.76	0.8	5.16	2.0
NP-DNGA150412FS2	●	2	12.7	4.76	1.2	5.16	1.9
NP-DNGA150604FS2	●	2	12.7	6.35	0.4	5.16	2.1
NP-DNGA150608FS2	●	2	12.7	6.35	0.8	5.16	2.0
NP-DNGA150612FS2	●	2	12.7	6.35	1.2	5.16	1.9
NP-DNGA150404GS2	●	2	12.7	4.76	0.4	5.16	2.1
NP-DNGA150408GS2	●	2	12.7	4.76	0.8	5.16	2.0
NP-DNGA150412GS2	●	2	12.7	4.76	1.2	5.16	1.9
NP-DNGA150604GS2	●	2	12.7	6.35	0.4	5.16	2.1
NP-DNGA150608GS2	●	2	12.7	6.35	0.8	5.16	2.0
NP-DNGA150612GS2	●	2	12.7	6.35	1.2	5.16	1.9
NP-DNGA150404TS2	●	2	12.7	4.76	0.4	5.16	2.1
NP-DNGA150408TS2	●	2	12.7	4.76	0.8	5.16	2.0
NP-DNGA150412TS2	●	2	12.7	4.76	1.2	5.16	1.9
NP-DNGA150604TS2	●	2	12.7	6.35	0.4	5.16	2.1
NP-DNGA150608TS2	●	2	12.7	6.35	0.8	5.16	2.0
NP-DNGA150612TS2	●	2	12.7	6.35	1.2	5.16	1.9

● : Inventory maintained in Japan. (1 insert in one case.)

Negative Inserts (With Hole)

G Class



NEW PETIT CUT			
NP_002			
NEW PETIT CUT			
NP_003			

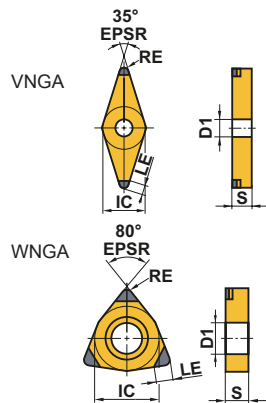
(mm)

Order Number	MB4120	Cutting Edges	IC	S	RE	D1	LE
NP-SNGA120404SF2	●	2	12.7	4.76	0.4	5.16	2.1
NP-SNGA120408SF2	●	2	12.7	4.76	0.8	5.16	2.3
NP-SNGA120412SF2	●	2	12.7	4.76	1.2	5.16	2.5
NP-SNGA120404SE2	●	2	12.7	4.76	0.4	5.16	2.1
NP-SNGA120408SE2	●	2	12.7	4.76	0.8	5.16	2.3
NP-SNGA120412SE2	●	2	12.7	4.76	1.2	5.16	2.5
NP-SNGA120404FS2	●	2	12.7	4.76	0.4	5.16	2.1
NP-SNGA120408FS2	●	2	12.7	4.76	0.8	5.16	2.3
NP-SNGA120412FS2	●	2	12.7	4.76	1.2	5.16	2.5
NP-SNGA120404GS2	●	2	12.7	4.76	0.4	5.16	2.1
NP-SNGA120408GS2	●	2	12.7	4.76	0.8	5.16	2.3
NP-SNGA120412GS2	●	2	12.7	4.76	1.2	5.16	2.5
NP-SNGA120404TS2	●	2	12.7	4.76	0.4	5.16	2.1
NP-SNGA120408TS2	●	2	12.7	4.76	0.8	5.16	2.3
NP-SNGA120412TS2	●	2	12.7	4.76	1.2	5.16	2.5
NP-TNGA160404SF3	●	3	9.525	4.76	0.4	3.81	1.6
NP-TNGA160408SF3	●	3	9.525	4.76	0.8	3.81	1.8
NP-TNGA160412SF3	●	3	9.525	4.76	1.2	3.81	1.9
NP-TNGA160404SE3	●	3	9.525	4.76	0.4	3.81	1.6
NP-TNGA160408SE3	●	3	9.525	4.76	0.8	3.81	1.8
NP-TNGA160412SE3	●	3	9.525	4.76	1.2	3.81	1.9
NP-TNGA160404FS3	●	3	9.525	4.76	0.4	3.81	1.6
NP-TNGA160408FS3	●	3	9.525	4.76	0.8	3.81	1.8
NP-TNGA160412FS3	●	3	9.525	4.76	1.2	3.81	1.9
NP-TNGA160404GS3	●	3	9.525	4.76	0.4	3.81	1.6
NP-TNGA160408GS3	●	3	9.525	4.76	0.8	3.81	1.8
NP-TNGA160412GS3	●	3	9.525	4.76	1.2	3.81	1.9
NP-TNGA160404TS3	●	3	9.525	4.76	0.4	3.81	1.6
NP-TNGA160408TS3	●	3	9.525	4.76	0.8	3.81	1.8
NP-TNGA160412TS3	●	3	9.525	4.76	1.2	3.81	1.9

CBN Grade for Sintered Alloys and Cast Irons

Positive Inserts (With Hole)

G Class



NEW PETIT CUT			
NP_002			
NEW PETIT CUT			
NP_003			

(mm)

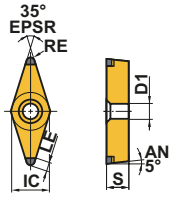
Order Number	MB4120	Cutting Edges	IC	S	RE	D1	LE
NP-VNGA160404SF2	●	2	9.525	4.76	0.4	3.81	2.5
NP-VNGA160408SF2	●	2	9.525	4.76	0.8	3.81	2.0
NP-VNGA160404SE2	●	2	9.525	4.76	0.4	3.81	2.5
NP-VNGA160408SE2	●	2	9.525	4.76	0.8	3.81	2.0
NP-VNGA160404FS2	●	2	9.525	4.76	0.4	3.81	2.5
NP-VNGA160408FS2	●	2	9.525	4.76	0.8	3.81	2.0
NP-VNGA160404GS2	●	2	9.525	4.76	0.4	3.81	2.5
NP-VNGA160408GS2	●	2	9.525	4.76	0.8	3.81	2.0
NP-VNGA160404TS2	●	2	9.525	4.76	0.4	3.81	2.5
NP-VNGA160408TS2	●	2	9.525	4.76	0.8	3.81	2.0
NP-WNGA080408SF3	●	3	12.7	4.76	0.8	5.16	2.1
NP-WNGA080408SE3	●	3	12.7	4.76	0.8	5.16	2.1
NP-WNGA080408FS3	●	3	12.7	4.76	0.8	5.16	2.1
NP-WNGA080408GS3	●	3	12.7	4.76	0.8	5.16	2.1
NP-WNGA080408TS3	●	3	12.7	4.76	0.8	5.16	2.1


● : Inventory maintained in Japan. (1 insert in one case.)

Positive Inserts (With Hole)

G Class

VBGW



NEW PETIT CUT			
NP_002			
			

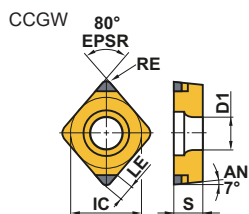
(mm)

Order Number	MB4120	Cutting Edges	IC	S	RE	D1	LE
NP-VBGW110304SF2	●	2	6.35	3.18	0.4	2.85	2.5
NP-VBGW110308SF2	●	2	6.35	3.18	0.8	2.85	2.0
NP-VBGW160404SF2	●	2	9.525	4.76	0.4	4.43	2.5
NP-VBGW160408SF2	●	2	9.525	4.76	0.8	4.43	2.0
NP-VBGW110304SE2	●	2	6.35	3.18	0.4	2.85	2.5
NP-VBGW110308SE2	●	2	6.35	3.18	0.8	2.85	2.0
NP-VBGW160404SE2	●	2	9.525	4.76	0.4	4.43	2.5
NP-VBGW160408SE2	●	2	9.525	4.76	0.8	4.43	2.0
NP-VBGW110304FS2	●	2	6.35	3.18	0.4	2.85	2.5
NP-VBGW110308FS2	●	2	6.35	3.18	0.8	2.85	2.0
NP-VBGW160404FS2	●	2	9.525	4.76	0.4	4.43	2.5
NP-VBGW160408FS2	●	2	9.525	4.76	0.8	4.43	2.0
NP-VBGW110304GS2	●	2	6.35	3.18	0.4	2.85	2.5
NP-VBGW110308GS2	●	2	6.35	3.18	0.8	2.85	2.0
NP-VBGW160404GS2	●	2	9.525	4.76	0.4	4.43	2.5
NP-VBGW160408GS2	●	2	9.525	4.76	0.8	4.43	2.0

CBN Grade for Sintered Alloys and Cast Irons

Positive Inserts (With Hole)

G Class



NEW PETIT CUT			
NP_002			

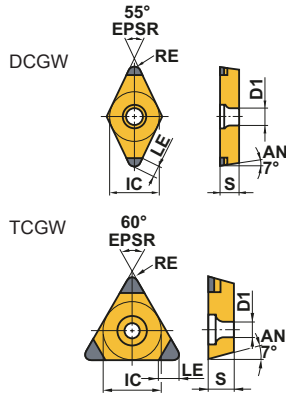
(mm)

Order Number	MB4120	Cutting Edges	IC	S	RE	D1	LE
NP-CCGW060202SF2	●	2	6.35	2.38	0.2	2.8	1.8
NP-CCGW060204SF2	●	2	6.35	2.38	0.4	2.8	1.9
NP-CCGW060208SF2	●	2	6.35	2.38	0.8	2.8	2.1
NP-CCGW09T302SF2	●	2	9.525	3.97	0.2	4.4	1.8
NP-CCGW09T304SF2	●	2	9.525	3.97	0.4	4.4	1.9
NP-CCGW09T308SF2	●	2	9.525	3.97	0.8	4.4	2.1
NP-CCGW060202SE2	●	2	6.35	2.38	0.2	2.8	1.8
NP-CCGW060204SE2	●	2	6.35	2.38	0.4	2.8	1.9
NP-CCGW060208SE2	●	2	6.35	2.38	0.8	2.8	2.1
NP-CCGW09T302SE2	●	2	9.525	3.97	0.2	4.4	1.8
NP-CCGW09T304SE2	●	2	9.525	3.97	0.4	4.4	1.9
NP-CCGW09T308SE2	●	2	9.525	3.97	0.8	4.4	2.1
NP-CCGW060202FS2	●	2	6.35	2.38	0.2	2.8	1.8
NP-CCGW060204FS2	●	2	6.35	2.38	0.4	2.8	1.9
NP-CCGW060208FS2	●	2	6.35	2.38	0.8	2.8	2.1
NP-CCGW09T302FS2	●	2	9.525	3.97	0.2	4.4	1.8
NP-CCGW09T304FS2	●	2	9.525	3.97	0.4	4.4	1.9
NP-CCGW09T308FS2	●	2	9.525	3.97	0.8	4.4	2.1
NP-CCGW060202GS2	●	2	6.35	2.38	0.2	2.8	1.8
NP-CCGW060204GS2	●	2	6.35	2.38	0.4	2.8	1.9
NP-CCGW060208GS2	●	2	6.35	2.38	0.8	2.8	2.1
NP-CCGW09T302GS2	●	2	9.525	3.97	0.2	4.4	1.8
NP-CCGW09T304GS2	●	2	9.525	3.97	0.4	4.4	1.9
NP-CCGW09T308GS2	●	2	9.525	3.97	0.8	4.4	2.1
NP-CCGW060208TS2	●	2	6.35	2.38	0.8	2.8	2.1
NP-CCGW09T308TS2	●	2	9.525	3.97	0.8	4.4	2.1

● : Inventory maintained in Japan. (1 insert in one case.)

Positive Inserts (With Hole)

G Class



NEW PETIT CUT			
NP_002			
NEW PETIT CUT			
NP_003			

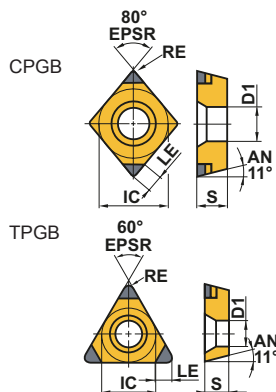
(mm)

Order Number	MB4120	Cutting Edges	IC	S	RE	D1	LE
NP-DCGW070204SF2	●	2	6.35	2.38	0.4	2.8	2.1
NP-DCGW070208SF2	●	2	6.35	2.38	0.8	2.8	2.0
NP-DCGW11T302SF2	●	2	9.525	3.97	0.2	4.4	1.5
NP-DCGW11T304SF2	●	2	9.525	3.97	0.4	4.4	2.1
NP-DCGW11T308SF2	●	2	9.525	3.97	0.8	4.4	2.0
NP-DCGW070204SE2	●	2	6.35	2.38	0.4	2.8	2.1
NP-DCGW070208SE2	●	2	6.35	2.38	0.8	2.8	2.0
NP-DCGW11T302SE2	●	2	9.525	3.97	0.2	4.4	1.5
NP-DCGW11T304SE2	●	2	9.525	3.97	0.4	4.4	2.1
NP-DCGW11T308SE2	●	2	9.525	3.97	0.8	4.4	2.0
NP-DCGW070204FS2	●	2	6.35	2.38	0.4	2.8	2.1
NP-DCGW070208FS2	●	2	6.35	2.38	0.8	2.8	2.0
NP-DCGW11T302FS2	●	2	9.525	3.97	0.2	4.4	1.5
NP-DCGW11T304FS2	●	2	9.525	3.97	0.4	4.4	2.1
NP-DCGW11T308FS2	●	2	9.525	3.97	0.8	4.4	2.0
NP-DCGW070204GS2	●	2	6.35	2.38	0.4	2.8	2.1
NP-DCGW070208GS2	●	2	6.35	2.38	0.8	2.8	2.0
NP-DCGW11T302GS2	●	2	9.525	3.97	0.2	4.4	1.5
NP-DCGW11T304GS2	●	2	9.525	3.97	0.4	4.4	2.1
NP-DCGW11T308GS2	●	2	9.525	3.97	0.8	4.4	2.0
NP-TCGW110204SF3	●	3	6.35	2.38	0.4	2.8	1.6
NP-TCGW110208SF3	●	3	6.35	2.38	0.8	2.8	1.8
NP-TCGW110204SE3	●	3	6.35	2.38	0.4	2.8	1.6
NP-TCGW110208SE3	●	3	6.35	2.38	0.8	2.8	1.8
NP-TCGW110204FS3	●	3	6.35	2.38	0.4	2.8	1.6
NP-TCGW110208FS3	●	3	6.35	2.38	0.8	2.8	1.8
NP-TCGW110204GS3	●	3	6.35	2.38	0.4	2.8	1.6
NP-TCGW110208GS3	●	3	6.35	2.38	0.8	2.8	1.8

CBN Grade for Sintered Alloys and Cast Irons

Positive Inserts (With Hole)

G Class



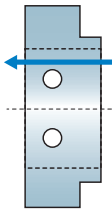
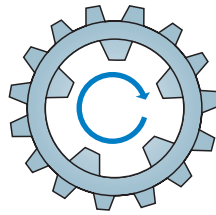
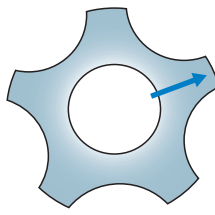
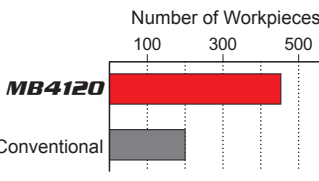
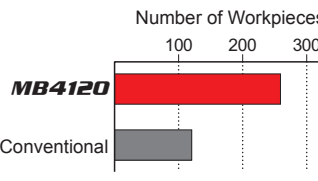
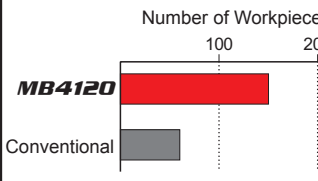
NEW PETIT CUT			
NP_002			
NEW PETIT CUT			
NP_003			

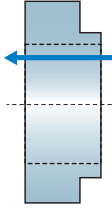
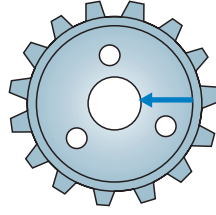
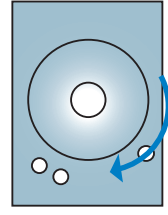
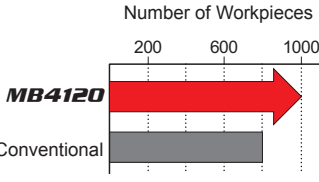
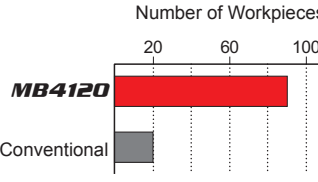
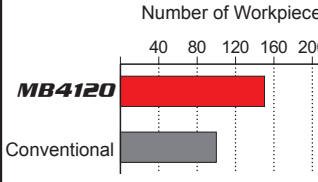
(mm)

Order Number	MB4120	Cutting Edges	IC	S	RE	D1	LE
NP-CPGB080202SE2	●	2	7.94	2.38	0.2	3.5	1.8
NP-CPGB080204SE2	●	2	7.94	2.38	0.4	3.5	1.9
NP-CPGB090302SE2	●	2	9.525	3.18	0.2	4.5	1.8
NP-CPGB090304SE2	●	2	9.525	3.18	0.4	4.5	1.9
NP-CPGB090308SE2	●	2	9.525	3.18	0.8	4.5	2.1
NP-CPGB080202FS2	●	2	7.94	2.38	0.2	3.5	1.8
NP-CPGB080204FS2	●	2	7.94	2.38	0.4	3.5	1.9
NP-CPGB090302FS2	●	2	9.525	3.18	0.2	4.5	1.8
NP-CPGB090304FS2	●	2	9.525	3.18	0.4	4.5	1.9
NP-CPGB090308FS2	●	2	9.525	3.18	0.8	4.5	2.1
NP-TPGB090202SF3	●	3	5.56	2.38	0.2	2.9	1.5
NP-TPGB090204SF3	●	3	5.56	2.38	0.4	2.9	1.6
NP-TPGB110302SF3	●	3	6.35	3.18	0.2	3.4	1.5
NP-TPGB110304SF3	●	3	6.35	3.18	0.4	3.4	1.6
NP-TPGB110308SF3	●	3	6.35	3.18	0.8	3.4	1.8
NP-TPGB090202SE3	●	3	5.56	2.38	0.2	2.9	1.5
NP-TPGB090204SE3	●	3	5.56	2.38	0.4	2.9	1.6
NP-TPGB110302SE3	●	3	6.35	3.18	0.2	3.4	1.5
NP-TPGB110304SE3	●	3	6.35	3.18	0.4	3.4	1.6
NP-TPGB110308SE3	●	3	6.35	3.18	0.8	3.4	1.8
NP-TPGB090202FS3	●	3	5.56	2.38	0.2	2.9	1.5
NP-TPGB090204FS3	●	3	5.56	2.38	0.4	2.9	1.6
NP-TPGB110302FS3	●	3	6.35	3.18	0.2	3.4	1.5
NP-TPGB110304FS3	●	3	6.35	3.18	0.4	3.4	1.6
NP-TPGB110308FS3	●	3	6.35	3.18	0.8	3.4	1.8
NP-TPGB090202GS3	●	3	5.56	2.38	0.2	2.9	1.5
NP-TPGB090204GS3	●	3	5.56	2.38	0.4	2.9	1.6
NP-TPGB110302GS3	●	3	6.35	3.18	0.2	3.4	1.5
NP-TPGB110304GS3	●	3	6.35	3.18	0.4	3.4	1.6
NP-TPGB110308GS3	●	3	6.35	3.18	0.8	3.4	1.8

● : Inventory maintained in Japan. (1 insert in one case.)

Application Examples

Insert		NP-DCGW11T308SF2	NP-DCGW11T308SF2	NP-DCGW11T308SF2
Workpiece		General Sintered Alloy 	General Sintered Alloy 	Iron-based Sintered Alloy (60HRB) Ra≤1.0μm 
Component		Housing(Interrupted Boring)	Case(Interrupted Boring)	Pinion(Interrupted Facing)
Cutting Conditions	Cutting Speed v_c (m/min)	200	180	200
	Feed per Rev. f (mm/rev)	0.07	0.25	0.04 – 0.05
	Depth of Cut a_p (mm)	0.2	0.2 – 0.3	0.4
Cutting Mode		Wet Cutting	Wet Cutting	Wet Cutting
Results		<p>Number of Workpieces</p>  <p>Double the tool life of the conventional product.</p>	<p>Number of Workpieces</p>  <p>Double the tool life of the conventional product.</p>	<p>Number of Workpieces</p>  <p>As compared with the conventional product, good surface finishes were maintained and 2.5 times longer tool life was achieved.</p>

Insert		NP-TNGA160408SF3	NP-TNGA160408SE3	NP-CNGA120408SF2
Workpiece		High Strength Sintered Alloy 	General Sintered Alloy 	Cast Iron 
Component		Sprocket(Continuous Boring)	Sprocket(Interrupted Facing)	Mechanical Parts(Interrupted Facing)
Cutting Conditions	Cutting Speed v_c (m/min)	250	240	600
	Feed per Rev. f (mm/rev)	0.1	0.12	0.175 – 0.25
	Depth of Cut a_p (mm)	0.1	0.05	0.15 – 0.2
Cutting Mode		Wet Cutting	Wet Cutting	Dry Cutting
Results		<p>Number of Workpieces</p>  <p>When comparing with the conventional product after machining the same number of workpieces, flank wear was smaller and further tool life extension can be expected.</p>	<p>Number of Workpieces</p>  <p>As compared with the conventional cermet product, higher surface quality and more than 4 times longer tool life was achieved.</p>	<p>Number of Workpieces</p>  <p>There is no abnormal damage and more than 1.5 times longer tool life was achieved.</p>

The above application examples are customer's applications, so it can be different from the recommended conditions.

Recommended Cutting Conditions

Sintered Alloys

(mm)

Work Material	Grade	Cutting Conditions	vc (m/min)					f (mm/rev)	ap	Cutting Mode
			100	150	200	250	300			
General Sintered Alloys	MB4120	Turning						≤0.2	≤0.3	Dry, Wet
High Strength Sintered Alloys	MB4120	Turning						≤0.2	≤0.3	Dry, Wet
Hardened Sintered Alloys	MB4120	Turning						≤0.2	≤0.3	Dry, Wet

Cast Irons

(mm)

Work Material	Grade	Cutting Conditions	vc (m/min)					f (mm/rev)	ap	Cutting Mode
			100	150	200	250	300			
Gray Cast Irons	MB4120	Turning						≤0.2	≤0.3	Dry, Wet

For Your Safety

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

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(Tools specifications subject to change without notice.)