

KBN020



**“Wear resistance + fracture resistance” lowers costs
when machining hardened material**

Combination of new coating technology and high content CBN provides
Exceptional wear resistance and fracture resistance.

Supports a wide range of applications from continuous to heavily interrupted machining.

Newly developed "MEGACOAT TOUGH" coating technology.

NEW New coating is now available



New coated CBN for machining hardened material

KBN020

Long tool life and stable machining results with wear resistance and fracture resistance.

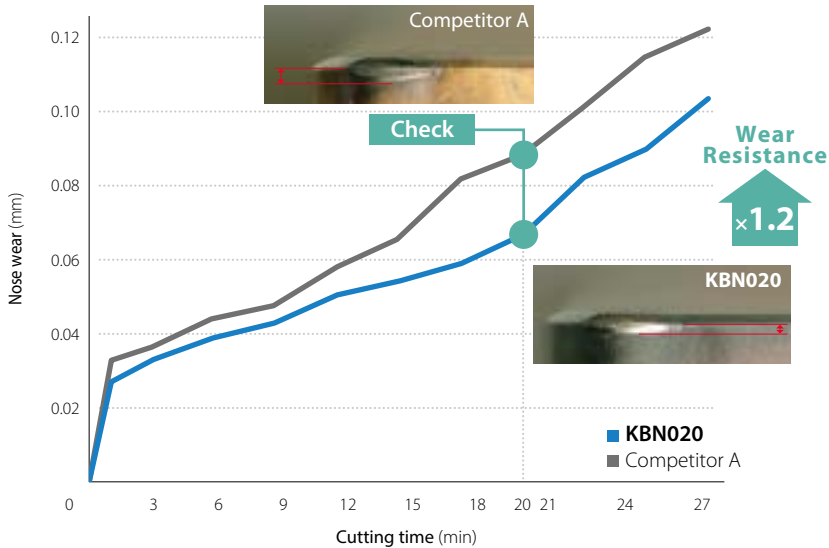
Supports a wide range of applications and reduces the cost of machining hardened materials.

1 Combination of new coating technology and high content CBN provides exceptional wear resistance and fracture resistance

Wear resistance

New coating "MEGACOAT TOUGH" suppresses layer peeling. Excellent wear resistance

Wear resistance comparison (in-house evaluation)

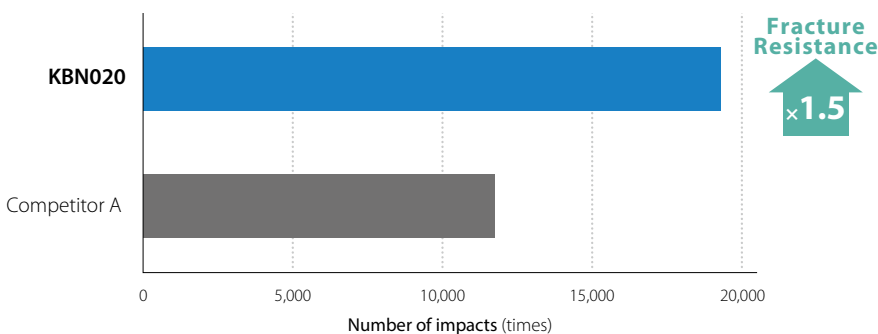


Cutting conditions : Vc = 150 m/min, ap = 0.2 mm, f = 0.1 mm/rev, Wet
Workpiece : SCM415® 60 HRC

Fracture resistance

High content CBN and high purity TiN binder improves strength of CBN. Excellent fracture resistance

Continuous to interrupted machining comparison (in-house evaluation)



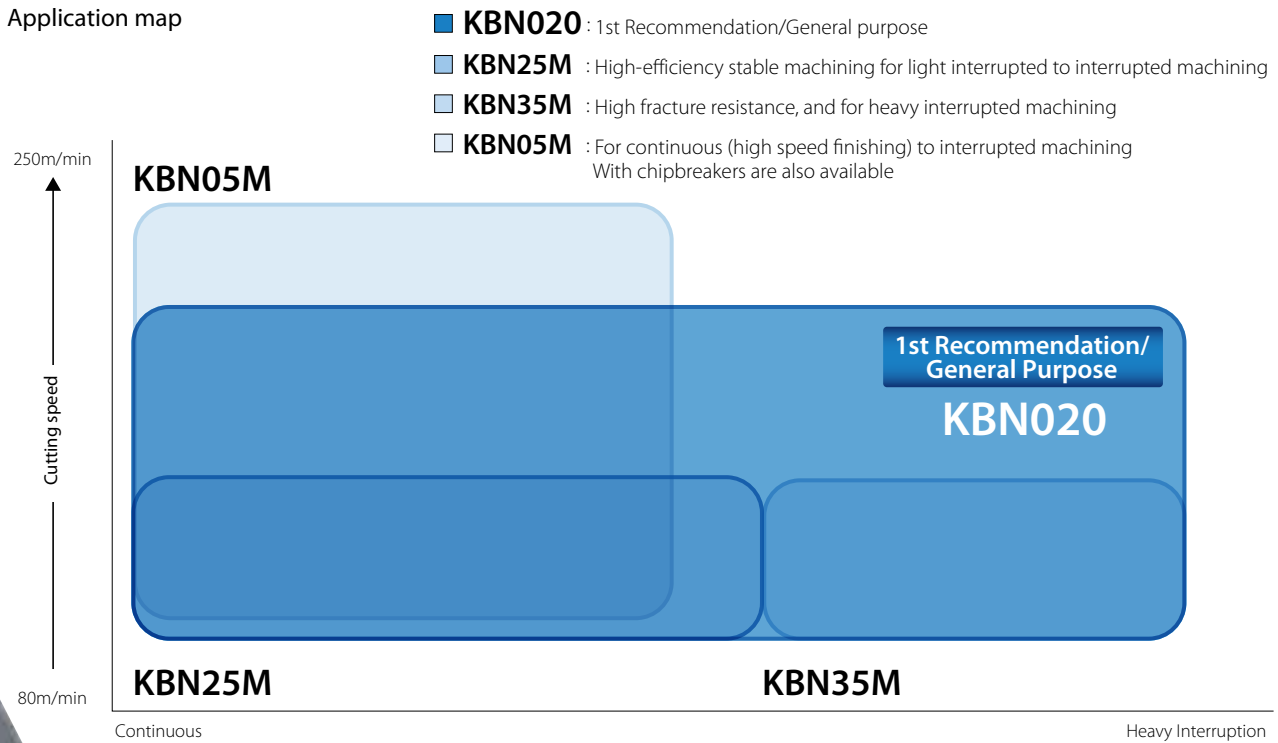
Cutting conditions : Vc = 150 m/min, ap = 0.2 mm, f = 0.2 mm/rev, Dry
Workpiece : SCM415® 60 HRC



2 Supports a wide range of applications from continuous to heavily interrupted machining

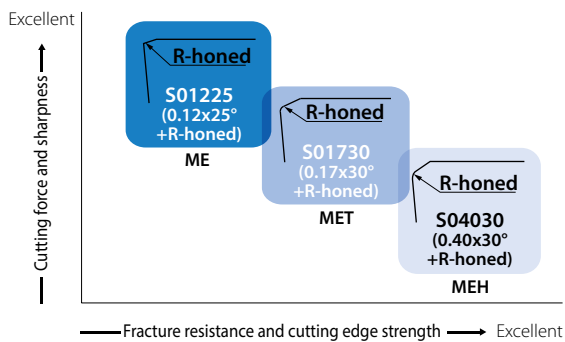
KBN020 covers a wide range of applications from continuous to interrupted machining of hardened material.

Application map

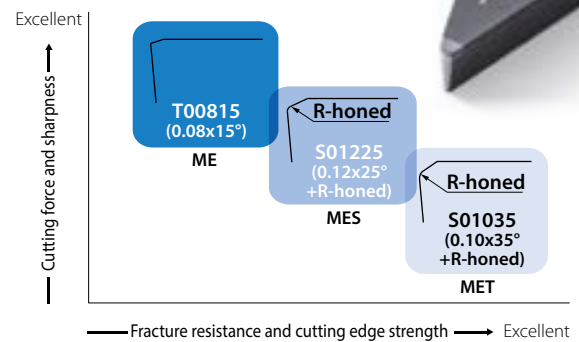


3 Extended lineup of cutting edge preparations for various applications and features

Negative insert



Positive insert



Negative insert standard cutting edge preparation (Hardened material machining)

Symbol	Cutting edge preparation		Applications and features
ME	S01225	0.12mm x 25° + R-honed	General purpose
MET	S01730	0.17mm x 30° + R-honed	Superior fracture resistance
MEH	S04030	0.40mm x 30° + R-honed	For interrupted · High-feed machining prevents flaking

Positive insert standard cutting edge preparation (Hardened material machining)

Symbol	Cutting edge preparation		Applications and features
ME	T00815	0.08mm x 15°	Chamfered sharp edge, minimize burrs
MES	S01225	0.12mm x 25° + R-honed	General purpose
MET	S01035	0.10mm x 35° + R-honed	For interruption stable machining

4

Newly developed coating "MEGACOAT TOUGH"



Features

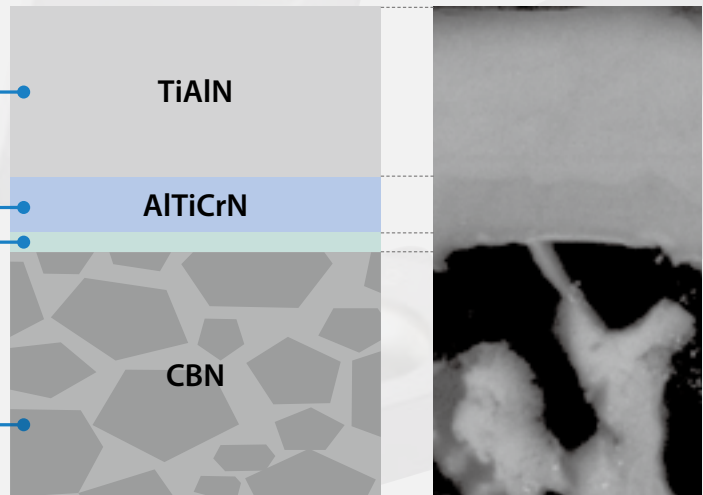
An adhesion layer is laminated between the high wear resistance layer and the CBN. Reduces layer peeling to achieve long tool life and stable machining.

High Wear Resistance Layer with TiAlN + Oxidation Resistance Components
Suppresses oxidation/diffusional wear

Check New Technology

- Interlayer for stress relief
- High adhesion layer

- Two layers dedicated to CBN
- Improved adhesion between CBN and high wear resistant layer.
- Suppressed layer peeling
- High content CBN with high purity TiN binder
- Improved CBN strength



Layer image

Case studies

Clutch SCr420H

Vc = 100 m/min
ap = 0.15 mm
f = 0.10 mm/rev
Wet
WNGA080408S01225



Tool life

KBN020 650 pcs/edge ↑ x1.6

Competitor B 400 pcs/edge

KBN020 provides stable machining with longer tool life. (User evaluation)

Gear SCM415

Vc = 100 m/min
ap = 0.05 mm
f = 0.15 mm/rev
Wet
CNGA120408S01325MEW



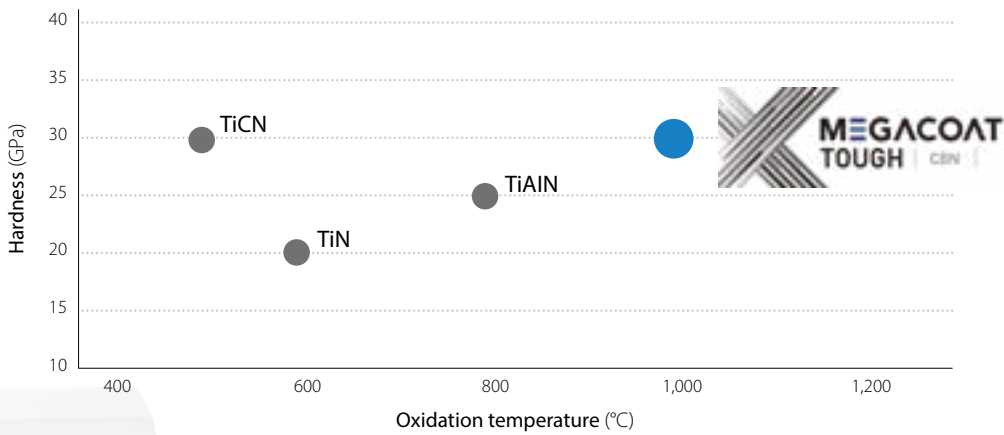
Tool life

KBN020 300 pcs/edge ↑ x1.5

Competitor C 200 pcs/edge

KBN020 improves dimensional variation with longer tool life. (User evaluation)

Coating properties (In-house evaluation)



Suppress layer peeling

Check

New technology
Improved adhesion between CBN and high wear resistance layer

KBN020



Competitor A



Cutting conditions : $V_c = 150$ m/min, $a_p = 0.2$ mm, $f = 0.2$ mm/rev, Dry Work Material : SCM 415® (In-house evaluation)

Special video



1. Shaft - External turning

DDJNL2525M-1504
DNGA150408S01225ME
SCM415® 62HRC

$V_c = 120$ m/min, $a_p = 0.2$ mm, $f = 0.18$ mm/rev (Interruption $f = 0.15$ mm/rev)

Excellent stable machining in continuous to interrupted machining.



2. Gear - Facing

DCLNL2525M-12
CNGA120412S01225ME
S45C® 58HRC

$V_c = 120$ m/min, $a_p = 0.4$ mm, $f = 0.15$ mm/rev

Stable machining in heavy interrupted machining.



Solution for automotive parts

Solution 1

Available for continuous to interrupted/heavy interrupted machining.
Can be used on a variety of part shapes such as machining shafts and gears.

Point

Excellent machining performance of auto suspension parts that use a lot of hardened materials.

Solution 2

Long tool life and stable machining.
High toughness suppresses sudden fractures during continuous to interrupted machining applications.

Point

Stable machining increases productivity.

Sun gear

Workpiece

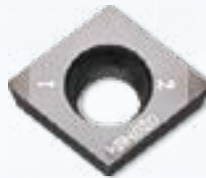
S45C (Carburizing and quenching)

Insert

CCMW09T308S01035MET

Applications

Boring finishing for spline part (Interruption)



(Image)



CVT shaft

Workpiece

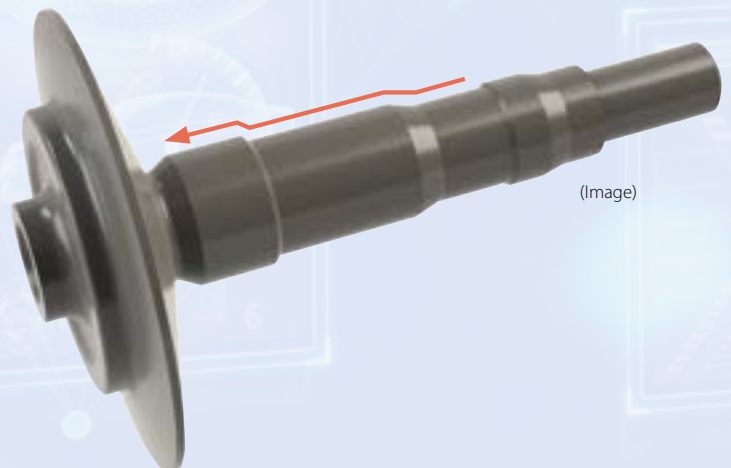
SCr420H

Insert

DNGA150404S01225ME

Applications

External finishing



(Image)

Diff ring

Workpiece

SCr420H

Insert

CNGA120408S01730MET

Applications

Facing (Interruption)



(Image)

Pinion gear

Workpiece

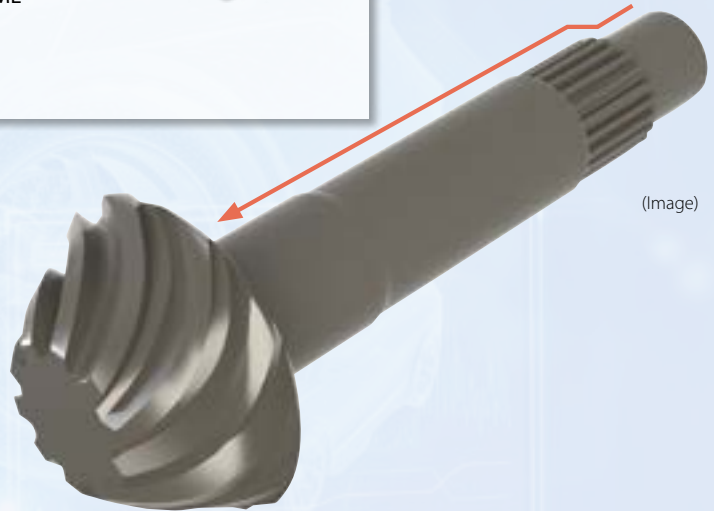
SCM420H

Insert

DNGA150404S01225ME

Applications

External finishing



(Image)

Side gear

Workpiece

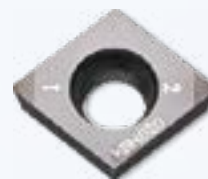
S45C (Carburizing and quenching)

Insert

CCMW09T308S01035MET

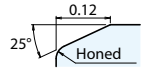
Applications

Boring finishing for spline part (Interruption)










(Image)

Negative type inserts

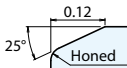
Cutting edge preparation			
Symbol	Cutting edge specification	Indication	Shape examples
S	Chamfered and honed	S01225 0.12 mm x 25° chamfered and honed	

Description	IC	S	D1
CNGA 1204_	12.70	4.76	5.16
DNGA 1504_	12.70	4.76	5.16
DNGA 1506_		6.35	


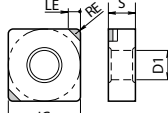

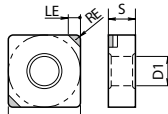

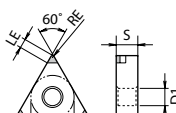

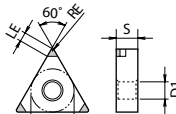

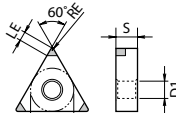

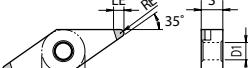

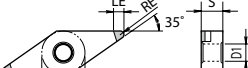

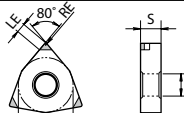

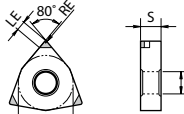
Shape	Description	Cutting edge preparation	Dimensions (mm)		No. of edges	MEGACOAT TOUGH NEW KBN020	
			RE	LE			
 Multi edge/ With wiper edge	CNGA 120404S01215MEW	S01215	0.4	2.6	2	●	
	120408S01215MEW		0.8	2.5		●	
	120412S01215MEW		1.2	2.5		●	
 Multi edge	CNGA 120402S01225ME	S01225	0.2	2.6	2	●	
	120404S01225ME		0.4	2.6		●	
	120408S01225ME		0.8	2.6		●	
	120412S01225ME		1.2	2.5		●	
	120416S01225ME		1.6	3.4		●	
	120420S01225ME		2.0	3.4		●	
 Multi edge/ Tough	CNGA 120404S01730MET	S01730	0.4	2.6	2	●	
	120408S01730MET		0.8	2.6		●	
	120412S01730MET		1.2	2.5		●	
	120416S01730MET		1.6	3.4		●	
 Multi edge/ Interruption	CNGA 120408S04030MEH	S04030	0.8	2.6	2	●	
	120412S04030MEH		1.2	2.5		●	
 Multi edge	DNGA 150401S01225ME	S01225	0.1	2.8	2	●	
	150402S01225ME		0.2	2.7		●	
	150404S01225ME		0.4	2.6		●	
	150408S01225ME		0.8	2.2		●	
	150412S01225ME		1.2	1.9		●	
	150416S01225ME		1.6	3.8		●	
	DNGA 150604S01225ME	S01225	0.4	2.6	2	●	
	150608S01225ME		0.8	2.2		●	
	 Multi edge/ Tough	DNGA 150404S01730MET	S01730	0.4	2.6	2	●
		150408S01730MET		0.8	2.2		●
150412S01730MET		1.2		1.9	●		
150416S01730MET		1.6		3.8	●		
DNGA 150604S01730MET		S01730	0.4	2.6	2	●	
150608S01730MET			0.8	2.2		●	
 Multi edge/ Interruption	DNGA 150404S04030MEH	S04030	0.4	2.6	2	●	
	150408S04030MEH		0.8	2.2		●	
	150412S04030MEH		1.2	1.9		●	

● : Available

Negative type inserts

Cutting edge preparation			
Symbol	Cutting edge specification	Indication	Shape examples
S	Chamfered and honed	S01225 0.12 mm x 25° chamfered and honed	

Description	IC	S	D1
SNGA 1204_	12.70	4.76	5.16
TNGA 1604_	9.525	4.76	3.81
VNGA 1604_	9.525	4.76	3.81
WNGA 0804_	12.70	4.76	5.16

Shape		Description	Cutting edge preparation	Dimensions (mm)		No. of edges	MEGACOAT TOUGH <small>NEW</small> KBN020
				RE	LE		
 Multi edge		SNGA 120404S01225ME	S01225	0.4	2.6	2	●
		120408S01225ME		0.8	2.6		●
 Multi edge/ Tough		SNGA 120404S01730MET	S01730	0.4	2.6	2	●
		120408S01730MET		0.8	2.6		●
		120412S01730MET		1.2	2.6		●
 Multi edge		TNGA 160401S01225ME	S01225	0.1	2.9	3	●
		160402S01225ME		0.2	2.8		●
		160404S01225ME		0.4	2.7		●
		160408S01225ME		0.8	2.4		●
		160412S01225ME		1.2	2.1		●
 Multi edge/ Tough		TNGA 160404S01730MET	S01730	0.4	2.7	3	●
		160408S01730MET		0.8	2.4		●
		160412S01730MET		1.2	2.1		●
 Multi edge/ Interruption		TNGA 160404S04030MEH	S04030	0.4	2.7	3	●
		160408S04030MEH		0.8	2.4		●
 Multi edge		VNGA 160401S01225ME	S01225	0.1	2.6	2	●
		160402S01225ME		0.2	2.3		●
		160404S01225ME		0.4	2.0		●
		160408S01225ME		0.8	2.7		●
 Multi edge/ Tough		VNGA 160404S01730MET	S01730	0.4	2.0	2	●
		160408S01730MET		0.8	2.7		●
 Multi edge		WNGA 080404S01225ME	S01225	0.4	2.6	3	●
		080408S01225ME		0.8	2.6		●
 Multi edge/ Tough		WNGA 080404S01730MET	S01730	0.4	2.0	3	●
		080408S01730MET		0.8	2.6		●

● : Available

Positive type inserts

Cutting edge preparation			
Symbol	Cutting edge specification	Indication	Shape examples
T	Chamfered	T00815 0.08 mm x 15° chamfered	
S	Chamfered and honed	S01225 0.12 mm x 25° chamfered and honed	

Description	IC	S	D1
CCMW 0602_	6.35	2.38	2.8
CCMW 09T3_	9.525	3.97	4.4
CPGB 0802_	7.94	2.38	3.5
CPGB 0903_	9.525	3.18	4.5
DCMW 0702_	6.35	2.38	2.8
DCMW 11T3_	9.525	3.97	4.4

Shape	Description	Cutting edge preparation	Dimensions (mm)		No. of edges	MEGACOAT TOUGH		
			RE	LE		NEW	KBN020	
 Multi edge	 CCMW 060202T00815ME 060204T00815ME 060208T00815ME	T00815	0.2	2.0	2	●	●	
			0.4	1.9				
			0.8	1.8				
	 Multi edge/ General purpose	 CCMW 09T302T00815ME 09T304T00815ME 09T308T00815ME	T00815	0.2	2.0	2	●	●
				0.4	1.9			
				0.8	1.8			
 Multi edge/ Tough	 CCMW 060204S01225MES 060208S01225MES	S01225	0.4	1.9	2	●	●	
			0.8	1.8				
 Multi edge/ Tough	 CCMW 09T304S01225MES 09T308S01225MES	S01225	0.4	1.9	2	●	●	
			0.8	1.8				
 Multi edge	 CCMW 09T304S01035MET 09T308S01035MET	S01035	0.4	1.9	2	●	●	
			0.8	1.8				
 Multi edge	 CPGB 080204T00815ME CPGB 090302T00815ME 090304T00815ME	T00815	0.4	1.9	2	●	●	
		T00815	0.2	2.6				
			0.4	2.6				
 Multi edge/ General purpose	 CPGB 090304S01225MES 090308S01225MES	S01225	0.4	2.5	2	●	●	
			0.8	2.5				
 Multi edge/ Tough	 CPGB 080204S01035MET 080208S01035MET	S01035	0.4	1.9	2	●	●	
			0.8	2.2				
	 Multi edge/ Tough	 CPGB 090304S01035MET 090308S01035MET	S01035	0.4	2.5	2	●	●
				0.8	2.5			
 Multi edge	 DCMW 070202T00815ME 070204T00815ME 070208T00815ME	T00815	0.2	2.4	2	●	●	
			0.4	2.2				
			0.8	1.9				
	 Multi edge	 DCMW 11T302T00815ME 11T304T00815ME 11T308T00815ME 11T312T00815ME	T00815	0.2	2.4	2	●	●
				0.4	2.2			
				0.8	1.9			
				1.2	1.9			
 Multi edge/ General purpose	 DCMW 11T302S01225MES 11T304S01225MES 11T308S01225MES	S01225	0.2	2.4	2	●	●	
			0.4	2.2				
			0.8	1.9				
 Multi edge/ Tough	 DCMW 070202S01035MET 070204S01035MET 070208S01035MET	S01035	0.2	1.9	2	●	●	
			0.4	1.7				
			0.8	1.9				
	 Multi edge/ Tough	 DCMW 11T302S01035MET 11T304S01035MET 11T308S01035MET 11T312S01035MET	S01035	0.2	2.4	2	●	●
				0.4	2.2			
				0.8	1.9			
				1.2	1.9			

● : Available

Positive type inserts

Cutting edge preparation			
Symbol	Cutting edge specification	Indication	Shape examples
T	Chamfered	T00815 0.08 mm x 15° chamfered	
S	Chamfered and honed	S01225 0.12 mm x 25° chamfered and honed	

Description	IC	S	D1
TPGB 1103_	6.35	3.18	3.5
TPGB 1603_	9.525		4.5
TPGW 1604_	9.525	4.76	4.4
VBGW 1103_	6.35	3.18	2.8
VBGW 1604_	9.525	4.76	4.4
VCGW 0802_	4.76	2.38	2.3

Shape	Description	Cutting edge preparation	Dimensions (mm)		No. of edges	MEGACOAT TOUGH NEW KBN020
			RE	LE		
 Multi edge	TPGB 110302T00815ME	T00815	0.2	2.3	3	●
	110304T00815ME		0.4	2.1		
	110308T00815ME		0.8	1.8		
 Multi edge/ General purpose	TPGB 110304S01225MES	S01225	0.4	2.1	3	●
	110308S01225MES		0.8	1.8		
 Multi edge/ Tough	TPGB 110302S01035MET	S01035	0.2	2.3	3	●
	110304S01035MET		0.4	2.1		
	110308S01035MET		0.8	1.8		
	TPGB 160304S01035MET	S01035	0.4	1.8	3	●
	160308S01035MET		0.8	1.5		
 Multi edge/ Tough	TPGW 160404S01035MET	S01035	0.4	1.8	3	●
	160408S01035MET		0.8	1.5		
 Multi edge	VBGW 110302T00815ME	T00815	0.2	2.4	2	●
	110304T00815ME		0.4	2.0		
	110308T00815ME		0.8	1.7		
	VBGW 160402T00815ME	T00815	0.2	2.4	2	●
	160404T00815ME		0.4	2.0		
	160408T00815ME		0.8	1.7		
 Multi edge/ General purpose	VBGW 110304S01225MES	S01225	0.4	2.0	2	●
	VBGW 160404S01225MES	S01225	0.4	2.0	2	●
 Multi edge/ Tough	VBGW 110302S01035MET	S01035	0.2	2.4	2	●
	110304S01035MET		0.4	2.0		
	110308S01035MET		0.8	1.7		
	VBGW 160402S01035MET	S01035	0.2	2.4	2	●
	160404S01035MET		0.4	2.0		
	160408S01035MET		0.8	1.7		
 Multi edge	VCGW 080202T00815ME	T00815	0.2	2.4	2	●
	080204T00815ME		0.4	2.0		
 Multi edge/ Tough	VCGW 080202S01035MET	S01035	0.2	2.4	2	●
	080204S01035MET		0.4	2.0		
	080208S01035MET		0.8	1.7		

● : Available

Recommended cutting conditions

Workpiece material	Hardness	Application		Recommended insert grade	Cutting conditions		
					Vc (m/min)	ap (mm)	f (mm/rev)
Hard materials	55HRC or more	General finishing	Continuous~Interruption	KBN020	80 - 150 - 200	0.05 - 0.2 - 0.5	0.05 - 0.2 - 0.45
		High-efficiency stable machining	Light interruption to interruption	KBN020	80 - 150 - 200	0.05 - 0.2 - 0.5	0.05 - 0.2 - 0.45
		Interruption (Small ap)	Interruption to heavy interruption	KBN020	80 - 130 - 180	0.05 - 0.2 - 0.5	0.05 - 0.2 - 0.4