KYOCERA

New coated CBN for machining hardened material | KBN015

KBN015

NEW

Lowers costs when machining hardened material

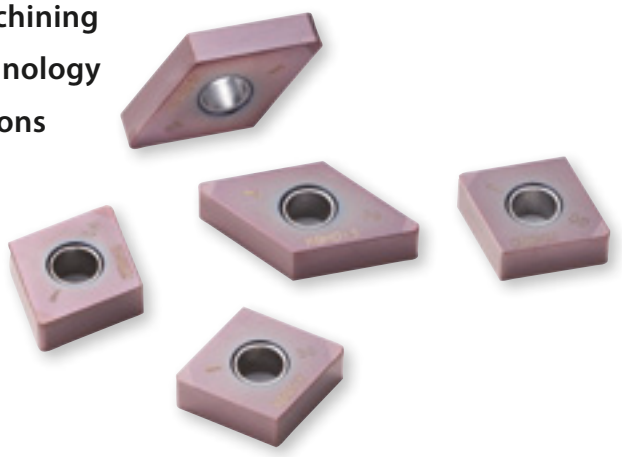
1st recommended grade for general purpose machining of high hardness material

Wear and fracture resistance drastically increase tool life

Supports high speed, continuous to interrupted machining

Newly developed »MEGACOAT TOUGH« coating technology

Three grades for a variety of hardened material options
KBN010 / KBN015 / KBN020



NEW New coating is now available

MEGACOAT TOUGH | CBN

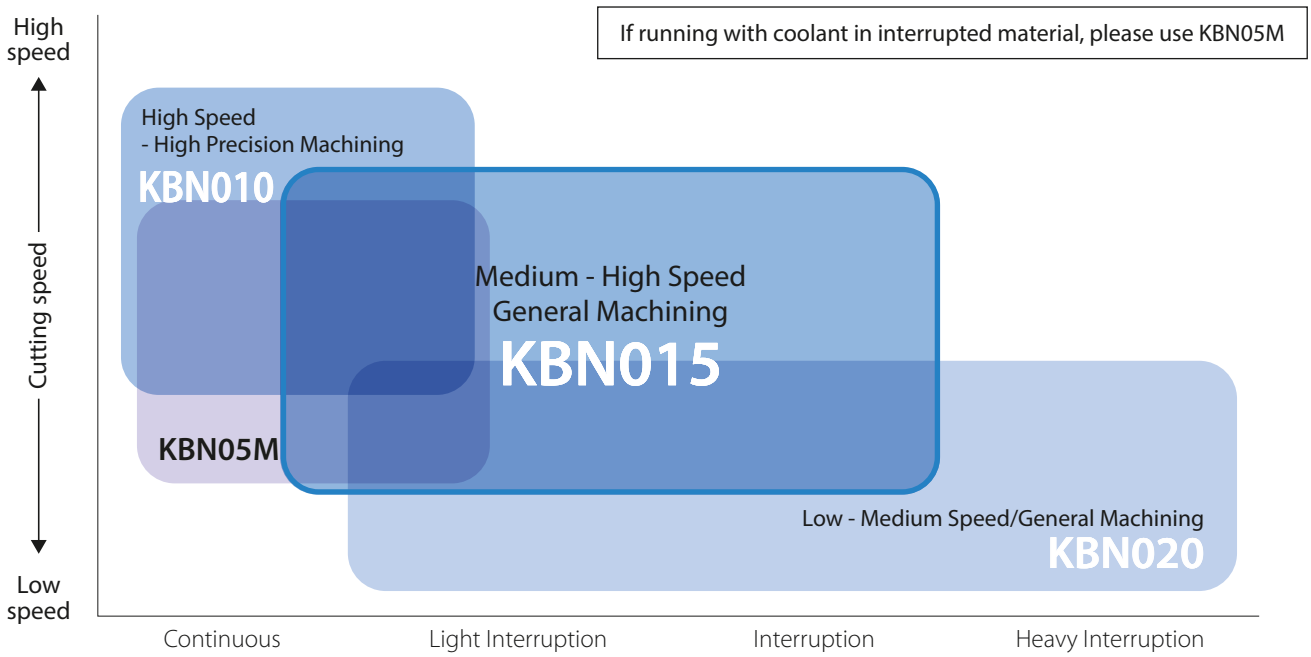
KEEPS YOU AHEAD

New coated CBN for machining hardened material

KBN015

1st recommended grade for general purpose machining of high hardness material.
»Wear resistance + fracture resistance« lowers costs when machining hardened material.

1 KBN015: 1st recommended grade for general purpose machining of high hardness material



KBN015

1st recommended grade of high hardness material.

Available for a wide range of machining applications from continuous to interrupted machining to high speed machining.

- New CBN maintains heat resistance and fracture resistance.
- »MEGACOAT TOUGH« coating technology.
  Special multi-layer improves wear resistance.

KBN010

High speed, high-precision machining.

- Mixed structure of micro grain CBN and coarse grain CBN. Excellent heat resistance and surface quality.
- »MEGACOAT TOUGH« coating technology.

KBN020

Good for heavily interrupted machining.

- High content CBN with high purity TiN-binder.
  High fracture resistance.
- »MEGACOAT TOUGH« coating technology.

Case studies

Gear SCM420H 58-60HRC

Continuous Facing
Vc = 180 m/min
ap = 0.2 mm
f = 0.1 mm/rev
Wet
CNGA120408S01225MEW

Tool life

KBN015	**2,000** pcs/edge	1.3×
Competitor A	1,500 pcs/edge	

KBN015 showed good cutting edge condition and maintains long tool life.
(User evaluation)

Outer Race S55C 62HRC

Internal Interrupted Turning
Vc = 160 m/min
ap = 0.2 mm
f = 0.17 mm/rev
Dry
TNGA160412S00545

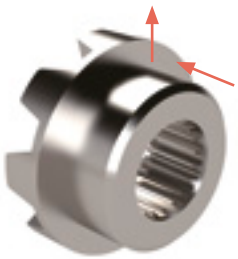
Tool life

KBN015	**500** pcs/edge	1.6×
Competitor B	300 pcs/edge	

KBN015 is resistant to chipping and maintains extended long tool life.
(User evaluation)

Gear SNCM220Ⓗ 58HRC

Vc = 125 m/min
ap = 0.25 mm
f = 0.1 mm/rev
Dry
CNGA120408S04030MEH



Tool life

KBN010	**600** pcs/edge	3.0×
Competitor C	200 pcs/edg.	

KBN010 provides longer tool life than competitor D.
(User evaluation)

Roll SKD11 62HRC

Vc = 145 m/min
ap = 0.25-0.50 mm
f = 0.1 mm/rev
Dry
DNGA150608S01225

Tool life

KBN010	**18** pcs/edge	1.3×
Competitor D	13 pcs/edge	

Achieved longer tool life with excellent wear resistance in continuous machining of hardened material.
(User evaluation)

Clutch SCr420H

Vc = 100 m/min
ap = 0.15 mm
f = 0.1 mm/rev
Wet
WNGA080408S01225

Tool life

KBN020	**650** pcs/edge	1.6×
Competitor E	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

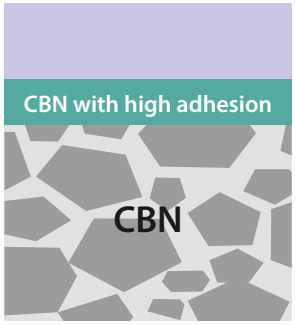
KBN020	**300** pcs/edge	1.5×
Competitor F	200 pcs/edge	

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

2 »MEGACOAT TOUGH« and new CBN provide both wear resistance and fracture resistance

MEGACOAT TOUGH | CBN |

»MEGACOAT TOUGH« coating with newly developed CBN dedicated high adhesion layer.
High adhesion suppresses delamination for long tool life and stable machining.



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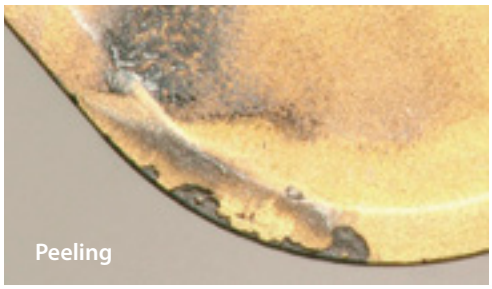
Cutting edge condition after machining (Internal evaluation)

KBN015

Competitor G



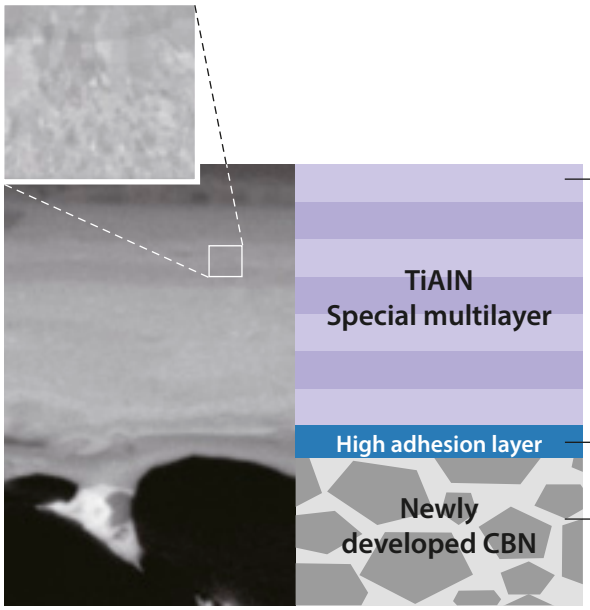
Cutting Conditions : Vc = 150 m/min, ap = 0.2 mm, f= 0.2 mm/rev, Dry SCM415Ⓗ HRC61

Intermediate layer and high adhesion layer for decreased stress improve adhesion with CBN.

KBN015 Medium – High speed / General machining

»MEGACOAT TOUGH« and new CBN substrate for long tool life and stable machining

Micronised film structure



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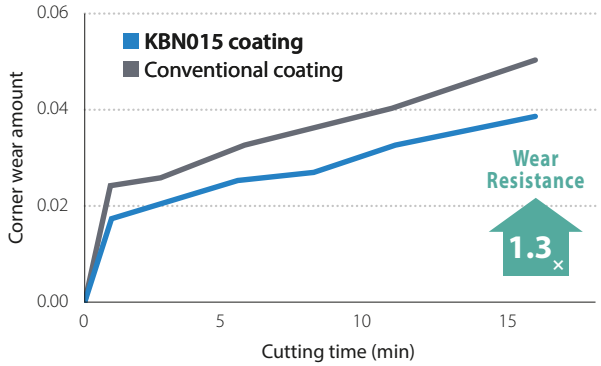
Wear resistance layer
- Improved heat resistance by optimizing film composition
- Improved hardness and toughness with atomization

Wear resistance comparison (Internal evaluation)



Cutting Conditions : Vc =150 m/min, f = 0.1 mm/rev, ap = 0.2 mm Wet SCM420Ⓗ

»MEGACOAT TOUGH« unique technology
Suppresses delamination with high adhesion.

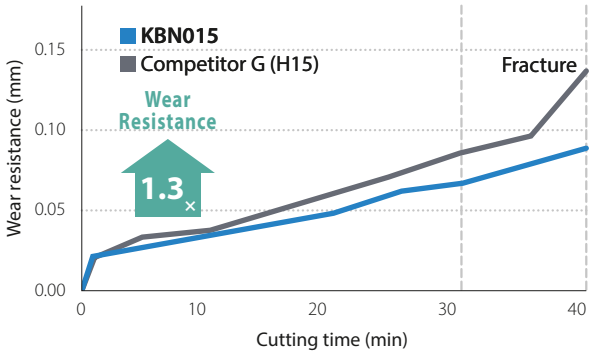
Balanced CBN with heat resistance and fracture resistance
- High purity and tough CBN abrasive grain.
- Fine ceramic binder improves heat resistance and fracture resistance.

Cutting performance

Excellent balance of abrasion resistance and fracture resistance, long tool life and stable machining.

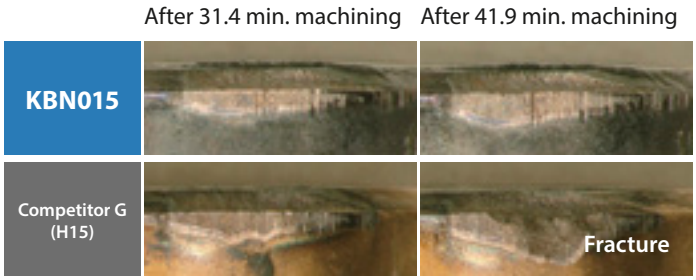
Medium speed machining evaluation (Vc=150 m/min.)
KBN015 has 1.3 times higher wear resistance of competitor G (H15) of the same grade.

Wear resistance comparison (Internal evaluation)



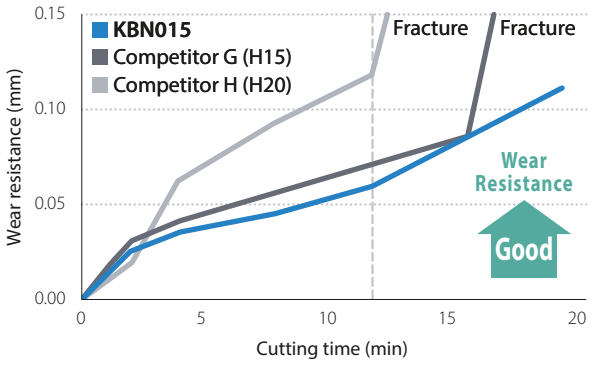
Cutting Conditions : Vc = 150 m/min, f = 0.1 mm/rev, ap = 0.2 mm Wet SCM415Ⓗ

Edge condition



High speed machining evaluation (Vc=200m/min.)
KBN015 has excellent wear resistance and fracture resistance compared to competitors H15 and H20 grades.

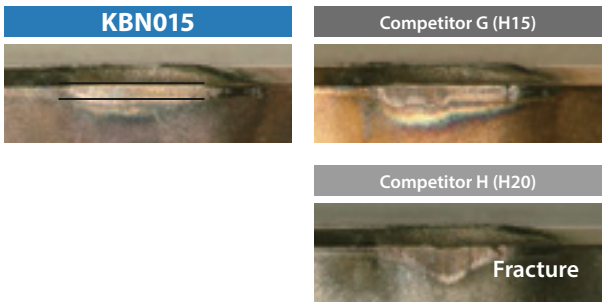
Wear resistance comparison (Internal evaluation)



Cutting Conditions : Vc = 200 m/min, f = 0.1 mm/rev, ap = 0.2 mm Wet SCM415Ⓗ

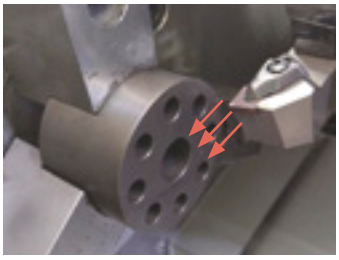
Edge condition

(after 11.5 min. machining)

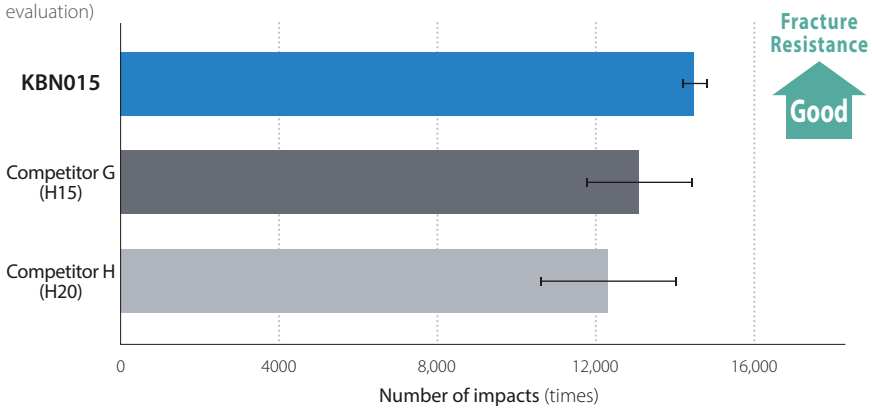


Interrupted machining evaluation.
KBN015 is resistant to chipping and has high stability compared to competitors H15 and H20 grades.

Fracture resistance comparison (Internal evaluation)

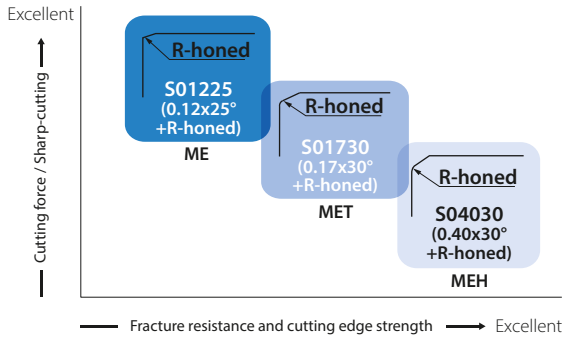


Cutting Conditions : Vc = 150 m/min
f = 0.2 mm/rev, ap = 0.2 mm Dry
SCM415Ⓗ

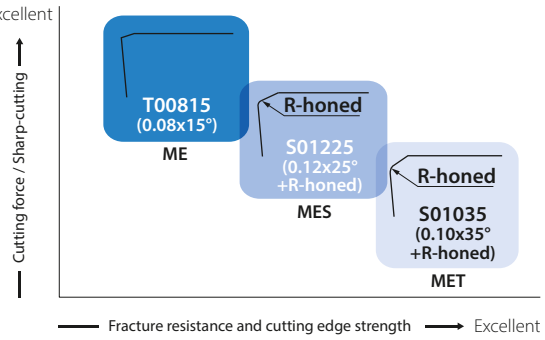


3 Extended line-up of cutting edge preparations

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

Recommended cutting conditions

Workpiece material		Recommended insert grade		Application	Cutting conditions		
					Vc (m/min)	Ap (mm)	f (mm/rev)
Hard materials	55 HRC or more	KBN010	High precision machining Finishing	Continuous	80 – **180** – 250	0.05 – **0.20** – 0.35	0.05 – **0.15** – 0.30
		KBN015	High speed/General	Continuous~ Interruption	80 – **180** – 230	0.05 – **0.20** – 0.50	0.05 – **0.20** – 0.45
		KBN020	Low speed/General	Continuous~ Heavy interruption	80 – **120** – 200	0.05 – **0.20** – 0.50	0.05 – **0.20** – 0.45

Solution for automotive parts

KBN010 / KBN015 / KBN020

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.

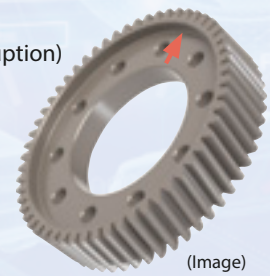
Sun gear

Boring finishing for spline part (Interruption)

(Image)

Diff ring

Facing (Interruption)



(Image)

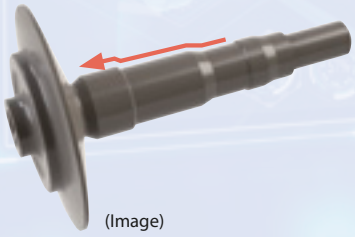
Pinion gear

External finishing

(Image)

CVT shaft

External finishing



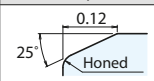
(Image)

Side gear

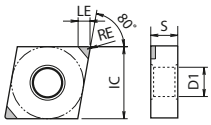
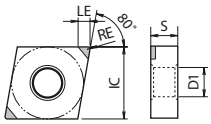
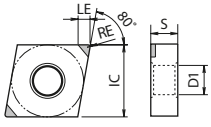
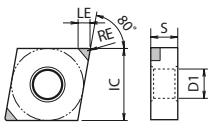
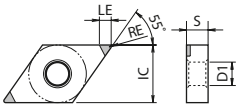
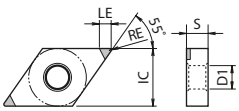
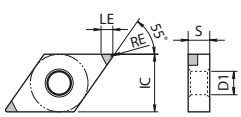
Boring finishing for spline part (Interruption)

(Image)

Standard stock (Negative)

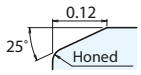
Cutting edge preparation				
Symbol	Cutting edge specification	Indication example		Shape
S	Chamfered and honed	S01225	0.12 mm × 25°chamfered and honed	

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

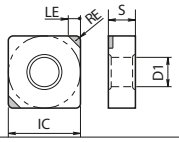
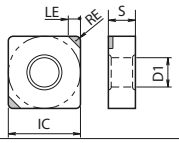
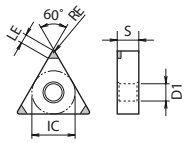
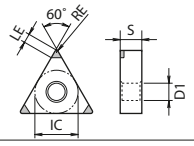
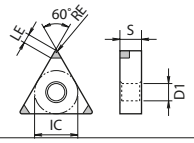
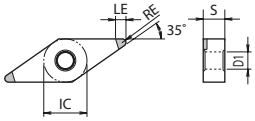
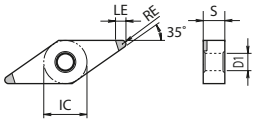
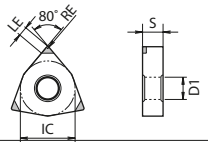
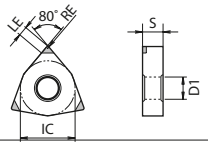
Shape		Description		Cutting edge prepa-ration	Dimensions (mm)		No. of edges	MEGACOAT TOUGH		
					RE	LE		KBN015	KBN010	KBN020
 Multi edge/With wiper edge		CNGA	120404S01215MEW	S01215	0.4	2.6	2	●	●	●
			120408S01215MEW		0.8	2.5		●	●	●
			120412S01215MEW		1.2	2.5		●	●	●
 Multi edge		CNGA	120402S01225ME	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

Standard stock (Negative)

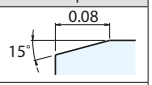
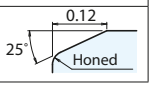
Cutting edge preparation				
Symbol	Cutting edge specification	Indication example		Shape
S	Chamfered and honed	S01225	0.12 mm × 25°chamfered and honed	

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

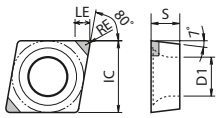
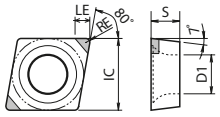
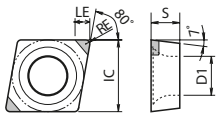
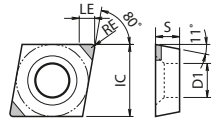
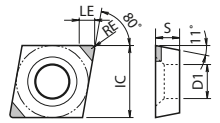
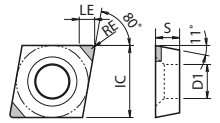
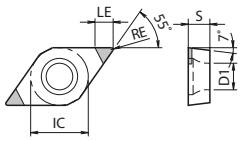
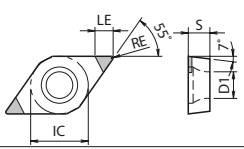
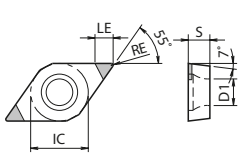
Shape		Description		Cutting edge preparation	Dimensions (mm) RE	Dimensions (mm) LE	No. of edges	MEGACOAT TOUGH KBN015	MEGACOAT TOUGH KBN010	MEGACOAT TOUGH KBN020
 Multi edge		SNGA	120404S01225ME	S01225	0.4	2.6	2	●	●	●
			120408S01225ME		0.8	2.6		●	●	●
 Multi edge/Tough		SNGA	120404S01730MET	S01730	0.4	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

Standard stock (Positive)

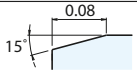
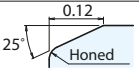
Cutting edge preparation				
Symbol	Cutting edge specification	Indication example		Shape
T	Chamfered	T00815	0.08 mm x 15° chamfered	
S	Chamfered and honed	S01225	0.12 mm x 25° chamfered and honed	

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

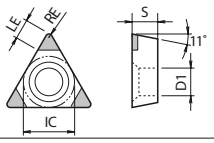
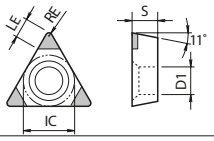
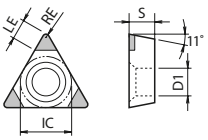
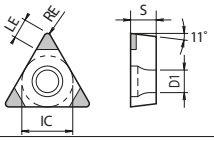
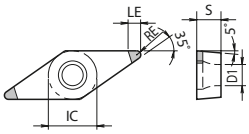
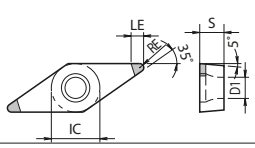
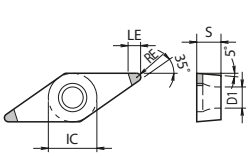
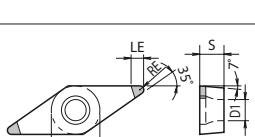
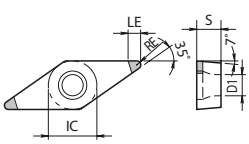
Shape		Description		Cutting edge preparation	Dimensions (mm)		No. of edges	MEGACOAT TOUGH		
					RE	LE		KBN015	KBN010	KBN020
 Multi edge		CCMW	060202T00815ME	T00815	0.2	2.0	2	●	●	●
			060204T00815ME		0.4	1.9		●	●	●
			060208T00815ME		0.8	1.8		●	●	●
		CCMW	09T302T00815ME	T00815	0.2	2.0	2	●	●	●
			09T304T00815ME		0.4	1.9		●	●	●
			09T308T00815ME		0.8	1.8		●	●	●
 Multi edge/General purpose		CCMW	060204S01225MES	S01225	0.4	1.9	2	●	●	●
			060208S01225MES		0.8	1.8		●	●	●
		CCMW	09T304S01225MES	S01225	0.4	1.9	2	●	●	●
			09T308S01225MES		0.8	1.8		●	●	●
 Multi edge/Tough		CCMW	09T304S01035MET	S01035	0.4	1.9	2	●	●	●
			09T308S01035MET		0.8	1.8		●	●	●
 Multi edge		CPGB	080204T00815ME	T00815	0.4	1.9	2	●	●	●
		CPGB	090302T00815ME	T00815	0.2	2.6	2	●	●	●
			090304T00815ME		0.4	2.6		●	●	●
 Multi edge/General purpose		CPGB	090304S01225MES	S01225	0.4	2.5	2	●	●	●
			090308S01225MES		0.8	2.5		●	●	●
 Multi edge/Tough		CPGB	080204S01035MET	S01035	0.4	1.9	2	●	●	●
			080208S01035MET		0.8	2.2		●	●	●
		CPGB	090304S01035MET	S01035	0.4	2.5	2	●	●	●
			090308S01035MET		0.8	2.5		●	●	●
 Multi edge		DCMW	070202T00815ME	T00815	0.2	2.4	2	●	●	●
			070204T00815ME		0.4	2.2		●	●	●
			070208T00815ME		0.8	1.9		●	●	●
		DCMW	11T302T00815ME	T00815	0.2	2.4	2	●	●	●
			11T304T00815ME		0.4	2.2		●	●	●
			11T308T00815ME		0.8	1.9		●	●	●
			11T312T00815ME		1.2	1.9		●	●	●
 Multi edge/General purpose		DCMW	11T302S01225MES	S01225	0.2	2.4	2	●	●	●
			11T304S01225MES		0.4	2.2		●	●	●
			11T308S01225MES		0.8	1.9		●	●	●
 Multi edge/Tough		DCMW	070202S01035MET	S01035	0.2	1.9	2	●	●	●
			070204S01035MET		0.4	1.7		●	●	●
			070208S01035MET		0.8	1.9		●	●	●
		DCMW	11T302S01035MET	S01035	0.2	2.4	2	●	●	●
			11T304S01035MET		0.4	2.2		●	●	●
			11T308S01035MET		0.8	1.9		●	●	●
			11T312S01035MET		1.2	1.9		●	●	●

●: Available

Standard stock (Positive)

Cutting edge preparation				
Symbol	Cutting edge specification	Indication example		Shape
T	Chamfered	T00815	0.08 mm × 15°chamfered	
S	Chamfered and honed	S01225	0.12 mm × 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		
					RE	LE		KBN015	KBN010	KBN020
 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

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