KYOCERA

HARD TURNING

Coated CBN for Machining Hardened Material

Lower Machining Costs in Hardened Material with Wear and Fracture Resistance

Combining new coating technology with 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

KBN010 / KBN015 / KBN020

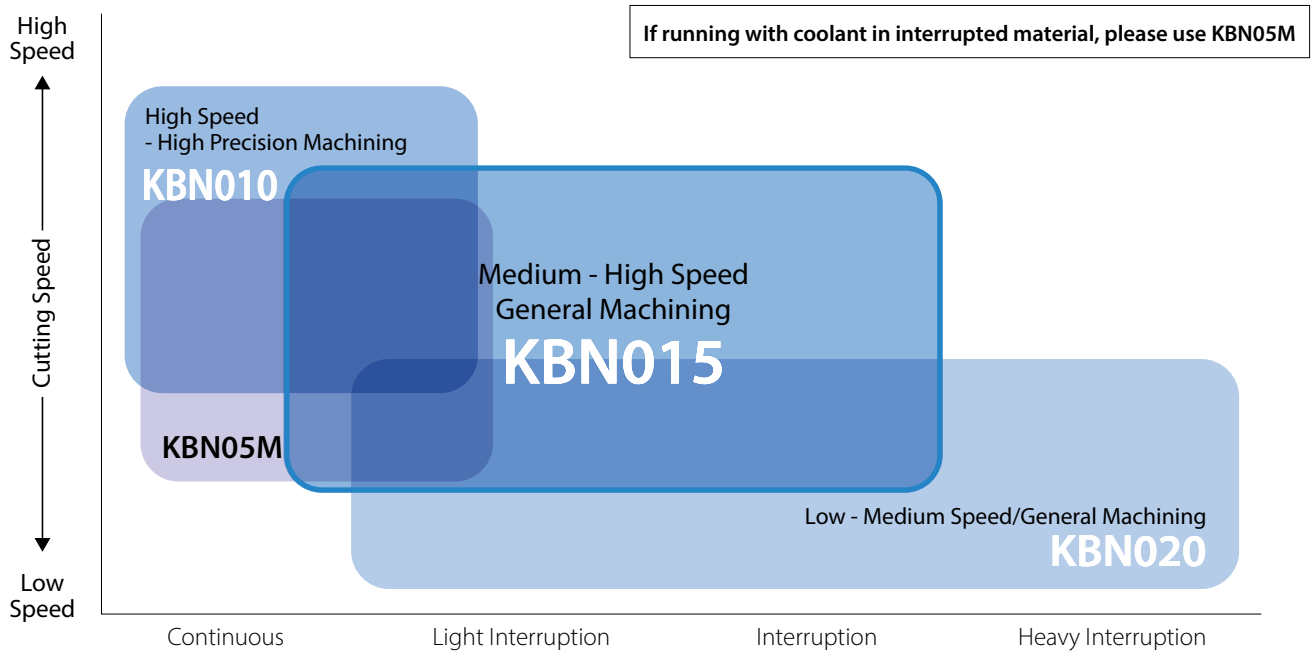
MEGACOAT TOUGH | CBN |

KBN010 / KBN015 / KBN020

Coated CBN for Machining Hardened Material

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 KBN015: 1st recommended grade for general purpose machining of hardened materials



KBN015

1st recommended grade for hardened material

Available for a wide range of machining applications from continuous to interrupted 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 for excellent heat resistance and surface quality**
- **"MEGACOAT TOUGH" Coating technology**

KBN020

For heavily interrupted machining

- **High content CBN with high purity TiN binder**
  High fracture resistance
- **"MEGACOAT TOUGH" Coating technology**

Case Studies

Gear 4118H 58-60HRC

Continuous Facing
Vc = 590 sfm
D.O.C. = 0.008"
f = 0.004 ipr
Wet
CNGA432S00525MEW

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 1055 62HRC

Internal Interrupted Turning
Vc = 520 sfm
D.O.C. = 0.008"
f = 0.007 ipr
Dry
TNGA333S00245

Tool Life

KBN015 **500 pcs/edge** 1.6×

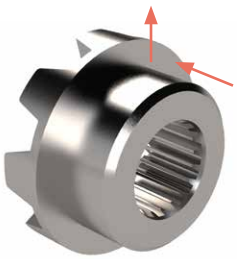
Competitor B **300 pcs/edge**

KBN015 is resistant to chipping and maintains extended long tool life.

(User Evaluation)

Gear 8620Ⓗ 58HRC

Vc = 410 sfm
D.O.C. = 0.010"
f = 0.004 ipr
Dry
CNGA432S01630MEH



Tool Life

KBN010 **600 pcs/edge** 3.0×

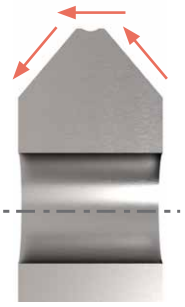
Competitor C **200 pcs/edge**

KBN010 provides longer tool life than competitor D.

(User Evaluation)

Roll D2 62HRC

Vc = 480 sfm
D.O.C. = 0.010" - 0.020"
f = 0.004 ipr
Dry
DNGA442S00525



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 5120H

Vc = 330 sfm
D.O.C. = 0.006"
f = 0.004 ipr
Wet
WNGA432S00525

Tool Life

KBN020 **650 pcs/edge** 1.6×

Competitor E **400 pcs/edge**

KBN020 provides stable machining with longer tool life.

(User Evaluation)

Gear Chromium Steel

Vc = 330 sfm
D. = 0.002"
f = 0.006 ipr
Wet
CNGA432S00525MEW

Tool Life

KBN020 **300 pcs/edge** 1.5×

Competitor F **200 pcs/edge**

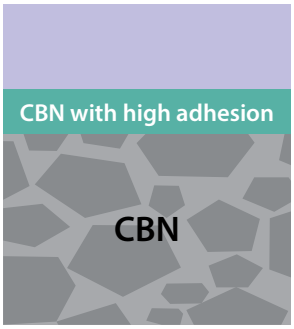
KBN020 improves dimensional variation with longer tool life.

(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

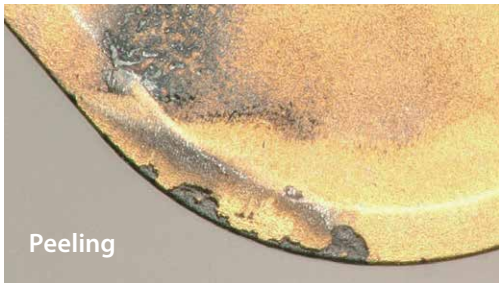


Cross-Section

Cutting Edge Condition after Machining (Internal Evaluation)

KBN015

Competitor G



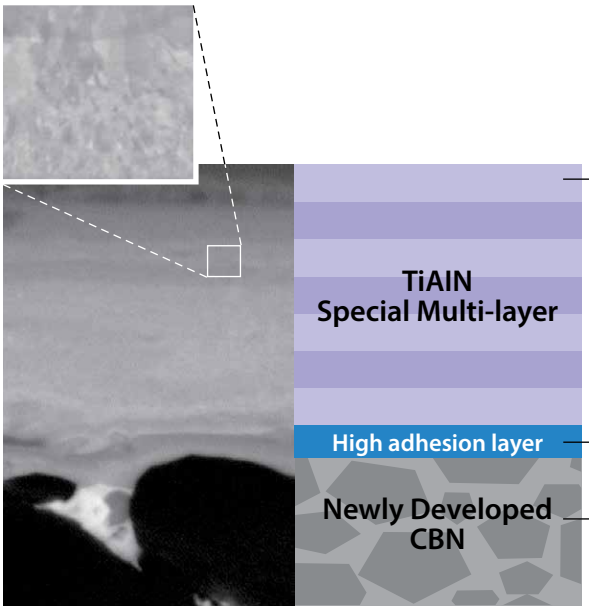
Cutting Conditions : Vc = 490 sfm, D.O.C. = 0.008" , f = 0.008 ipr Dry 4118H 61 HRC

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

Medium - High Speed/General Machining **KBN015**

"MEGACOAT TOUGH" and New CBN substrate for Long Tool Life and Stable Machining

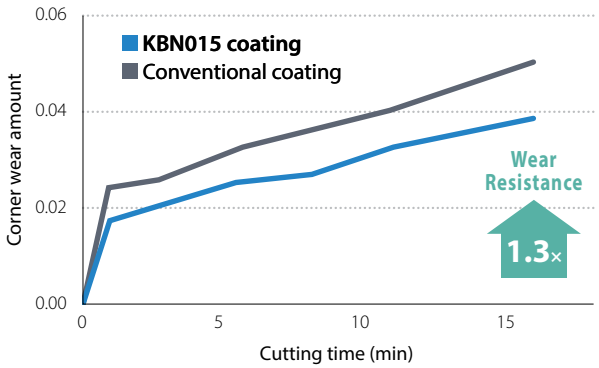
Micronized film structure



Layer Cross-Section

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

Wear resistance comparison (Internal evaluation)



Cutting Conditions : Vc =490 sfm, f = 0.004 ipr D.O.C. = 0.008" Wet 4118H

"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

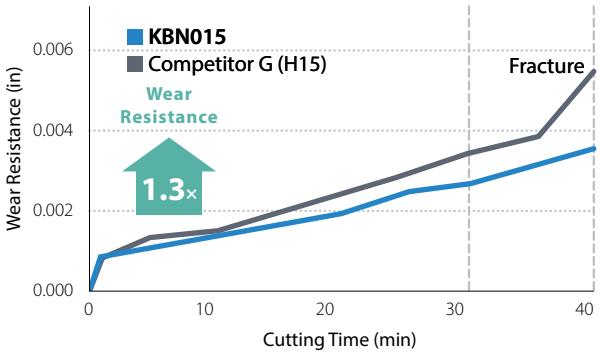
Cutting Performance

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

Medium Speed Machining Evaluation (Vc = 490 sfm)

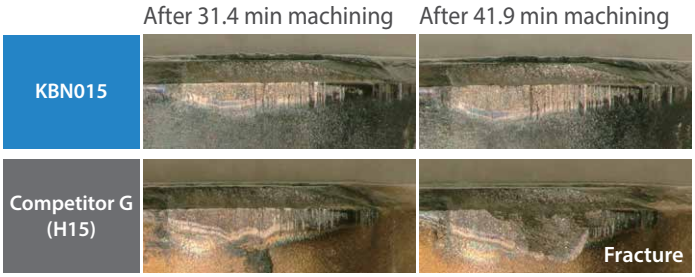
KBN015 has 1.3 times higher wear resistance of competitor G (H15).

Wear Resistance Comparison (Internal Evaluation)



Cutting Conditions : Vc = 490 sfm, f = 0.004 ipr, D.O.C. = 0.008" ipr Wet 4118H

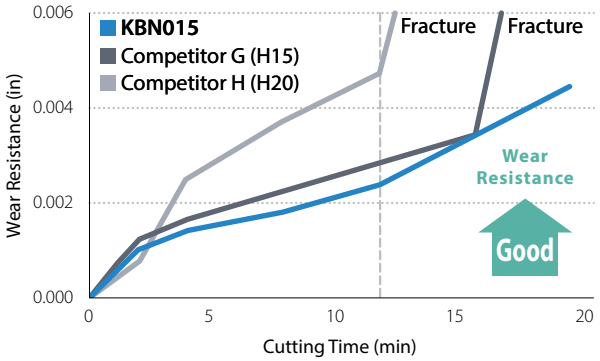
Edge Condition



High Speed Machining Evaluation (Vc = 660 sfm)

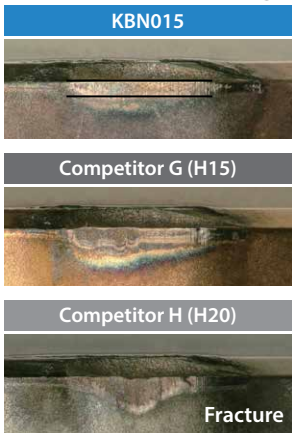
KBN015 has excellent wear resistance and fracture resistance compared to competitor's H15 and H20 grades.

Wear Resistance Comparison (Internal Evaluation)



Cutting Conditions : Vc = 660 sfm, f = 0.004 ipr, D.O.C. = 0.008" Wet 4118H

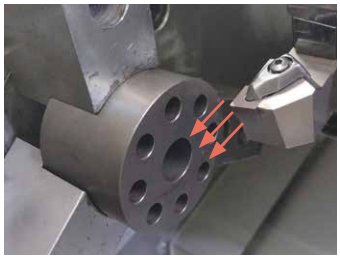
Edge condition
(after 11.5 min machining)



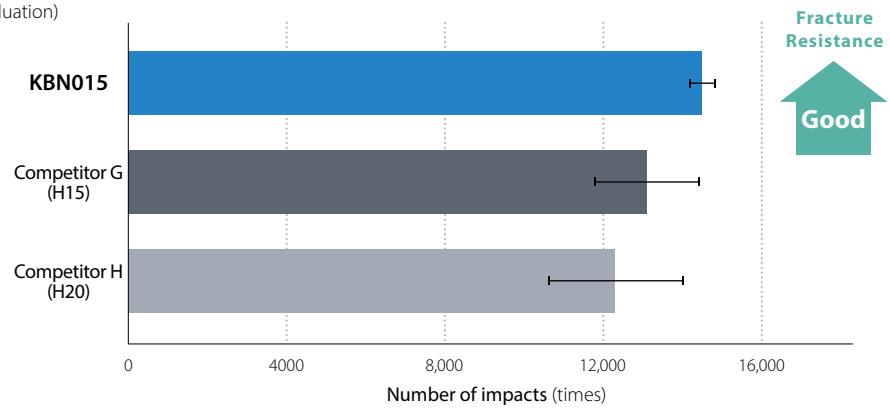
Interrupted Machining Evaluation

KBN015 is resistant to chipping and has high stability compared to competitor's H15 and H20 grades.

Fracture Resistance Comparison (Internal Evaluation)

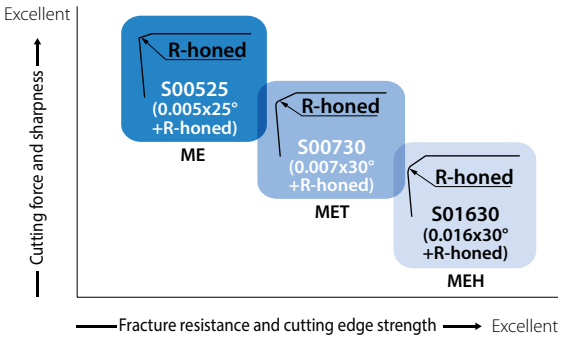


Cutting Conditions : Vc = 490 sfm
f = 0.008 ipr, D.O.C. = 0.008" Dry
4118H

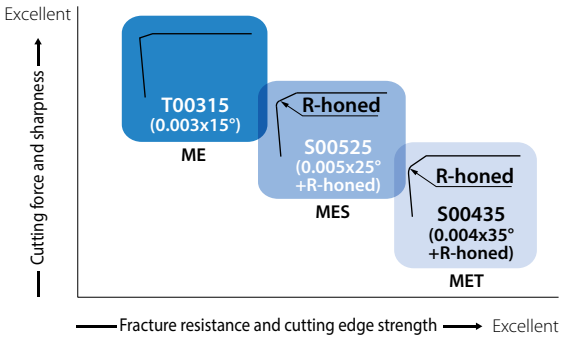


3 Extended lineup of cutting edge preparations

Negative Insert



Positive Insert



Negative Insert - Standard Cutting Edge Prep. (Hardened Material Machining)

Symbol	Cutting Edge Prep.		Applications and Features
ME	S00525	0.005" x 25° + R-honed	General purpose
MET	S00730	0.007" x 30° + R-honed	Superior fracture resistance
MEH	S01630	0.016" x 30° + R-honed	For interrupted · high-feed machining Prevents flaking

Positive Insert - Standard Cutting Edge Prep. (Hardened Material Machining)

Symbol	Cutting Edge Prep.		Applications and Features
ME	T00315	0.003" x 15°	Chamfered Sharp Edge, Minimize Burrs
MES	S00525	0.005" x 25° + R-honed	General Purpose
MET	S00435	0.004" x 35° + R-honed	For interruption Stable machining

Recommended Cutting Conditions

Workpiece Material		Recommended Insert Grade		Application	Cutting Conditions		
					Vc (sfm)	D.O.C. (in)	f (ipr)
Hardened Materials	55 HRC or more	KBN010	High Precision Machining Finishing	Continuous	260 - **590** - 820	0.002 - **0.008** - 0.014	0.002 - **0.006** - 0.012
		KBN015	High Speed / General Machining	Continuous ~ Interruption	260 - **590** - 750	0.002 - **0.008** - 0.020	0.002 - **0.008** - 0.018
		KBN020	Low Speed / General Machining	Continuous ~ Heavy Interruption	260 - **390** - 660	0.002 - **0.008** - 0.020	0.002 - **0.008** - 0.018

Solutions for Automotive Parts

KBN010 / KBN015 / KBN020

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

Excellent machining performance of auto suspension parts that use hardened materials

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

Stable machining increases productivity

Sun Gear

Boring finishing for spline part (Interruption)

Diff Ring

Facing (Interruption)

Pinion Gear

External finishing

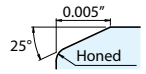
CVT Shaft

External finishing

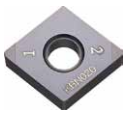
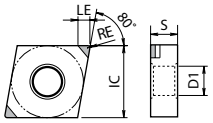
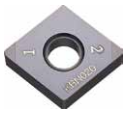
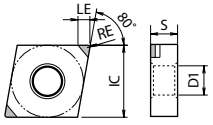
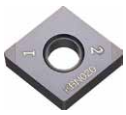
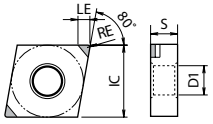
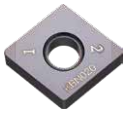
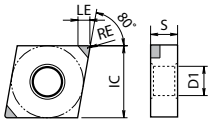
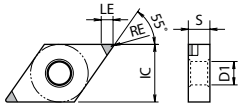
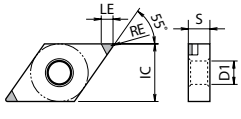
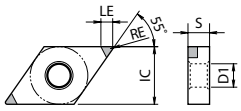
Side Gear

Boring finishing for spline part (Interruption)

Negative Inserts

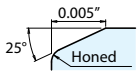
Cutting Edge Preparation				
Symbol	Cutting Edge Specification	Indication		Shape examples
S	Chamfered and Honed	S00525	0.005" x 25°chamfered and honed	

Part Number	IC	S	D1
CNGA 43_	1/2	3/16	0.203
DNGA 43_	1/2	3/16	0.203
DNGA 44_		1/4	

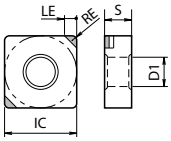
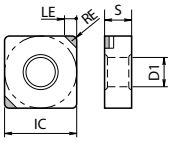
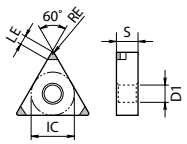
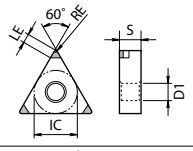
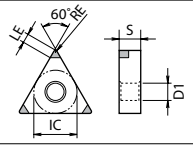
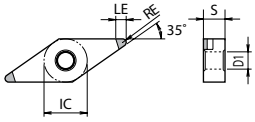
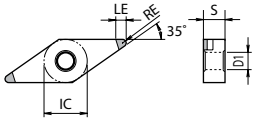
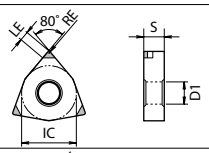
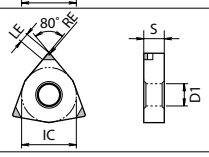
Shape		Part Number	Cutting Edge Preparation	Dimensions (in)		No. of Edges	MEGACOAT TOUGH		
				RE	LE		KBN010	KBN015	KBN020
 Multi-Edge / Wiper Edge		CNGA 431S00515MEW	S00515	1/64	0.102	2	●	●	●
		432S00515MEW		1/32	0.098		●	●	●
		433S00515MEW		3/64	0.098		●	●	●
 Multi-Edge		CNGA 4305S00525ME	S00525	0.008	0.102	2	●	●	●
		431S00525ME		1/64	0.102		●	●	●
		432S00525ME		1/32	0.102		●	●	●
		433S00525ME		3/64	0.098		●	●	●
		434S00525ME		1/16	0.134		●	●	●
		435S00525ME		5/64	0.134		●	●	●
 Multi-Edge / Tough		CNGA 431S00730MET	S00730	1/64	0.102	2	●	●	●
		432S00730MET		1/32	0.102		●	●	●
		433S00730MET		3/64	0.098		●	●	●
		434S00730MET		1/16	0.134		●	●	●
 Multi-Edge / Interruption		CNGA 432S01630MEH	S01630	1/32	0.102	2	●	●	●
		433S01630MEH		3/64	0.098		●	●	●
 Multi-Edge		DNGA 4302S00525ME	S00525	0.004	0.110	2	●	●	●
		4305S00525ME		0.008	0.106		●	●	●
		431S00525ME		1/64	0.102		●	●	●
		432S00525ME		1/32	0.087		●	●	●
		433S00525ME		3/64	0.075		●	●	●
		434S00525ME		1/16	0.150		●	●	●
		DNGA 441S00525ME	S00525	1/64	0.102	2	●	●	●
		442S00525ME		1/32	0.087		●	●	●
 Multi-Edge / Tough		DNGA 431S00730MET	S00730	1/64	0.102	2	●	●	●
		432S00730MET		1/32	0.087		●	●	●
		433S00730MET		3/64	0.075		●	●	●
		434S00730MET		1/16	0.150		●	●	●
		DNGA 441S00730MET	S00730	1/64	0.102	2	●	●	●
		442S00730MET		1/32	0.087		●	●	●
 Multi-Edge / Interruption		DNGA 431S01630MEH	S01630	1/64	0.102	2	●	●	●
		432S01630MEH		1/32	0.087		●	●	●
		433S01630MEH		3/64	0.075		●	●	●

● : Standard Item

Negative Inserts

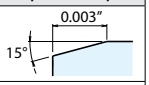
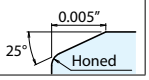
Cutting Edge Preparation				
Symbol	Cutting Edge Specification	Indication		Shape examples
S	Chamfered and Honed	S00525	0.005" x 25°chamfered and honed	

Part Number	IC	S	D1
SNGA 43_	1/2	3/16	0.203
TNGA 33_	3/8	3/16	0.150
VNGA 33_	3/8	3/16	0.150
WNGA 43_	1/2	3/16	0.203

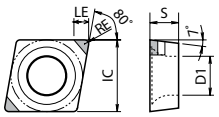
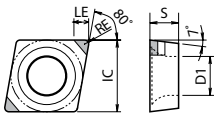
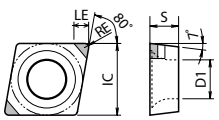
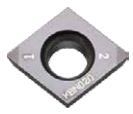
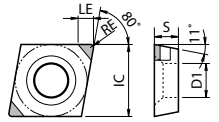
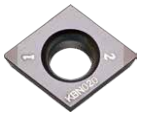
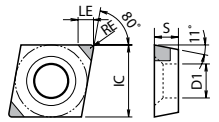
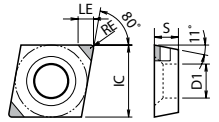
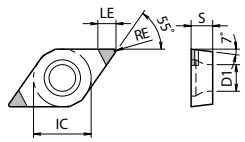
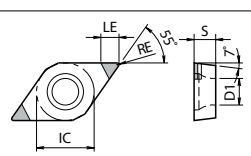
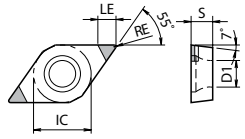
Shape		Part Number		Cutting Edge Preparation	Dimensions (in)		No. of Edges	MEGACOAT TOUGH		
					RE	LE		KBN010	KBN015	KBN020
 Multi-Edge		SNGA	431S00525ME	S00525	1/64	0.102	2	●	●	●
			432S00525ME		1/32	0.102		●	●	●
 Multi-Edge / Tough		SNGA	431S00730MET	S00730	1/64	0.102	2	●	●	●
			432S00730MET		1/32	0.102		●	●	●
			433S00730MET		3/64	0.102		●	●	●
 Multi-Edge		TNGA	3302S00525ME	S00525	0.004	0.114	3	●	●	●
			3305S00525ME		0.008	0.110		●	●	●
			331S00525ME		1/64	0.106		●	●	●
			332S00525ME		1/32	0.094		●	●	●
			333S00525ME		3/64	0.083		●	●	●
 Multi-Edge / Tough		TNGA	331S00730MET	S00730	1/64	0.106	3	●	●	●
			332S00730MET		1/32	0.094		●	●	●
			333S00730MET		3/64	0.083		●	●	●
 Multi-Edge / Interruption		TNGA	331S01630MEH	S01630	1/64	0.106	3	●	●	●
			332S01630MEH		1/32	0.094		●	●	●
 Multi-Edge		VNGA	3302S00525ME	S00525	0.004	0.102	2	●	●	●
			3305S00525ME		0.008	0.091		●	●	●
			331S00525ME		1/64	0.079		●	●	●
			332S00525ME		1/32	0.106		●	●	●
 Multi-Edge / Tough		VNGA	331S00730MET	S00730	1/64	0.079	2	●	●	●
			332S00730MET		1/32	0.106		●	●	●
 Multi-Edge		WNGA	431S00525ME	S00525	1/64	0.102	3	●	●	●
			432S00525ME		1/32	0.102		●	●	●
 Multi-Edge / Tough		WNGA	431S00730MET	S00730	1/64	0.079	3	●	●	●
			432S00730MET		1/32	0.102		●	●	●

● : Standard Item

Positive Inserts

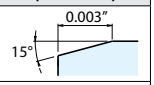
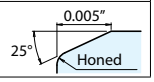
Cutting Edge Preparation				
Symbol	Cutting Edge Specification	Indication		Shape Examples
T	Chamfered	T00315	0.003" x 15°chamfered	
S	Chamfered and Honed	S00525	0.005" x 25°chamfered and honed	

Part Number	IC	S	D1
CCMW 215_	1/4	3/32	0.110
CCMW 325_	3/8	5/32	0.173
CPGB 2515_	5/16	3/32	0.138
CPGB 32_	3/8	1/8	0.177
DCMW 215_	1/4	3/32	0.110
DCMW 325_	3/8	5/32	0.173

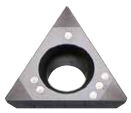
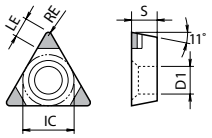
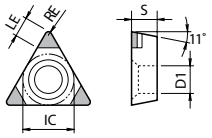
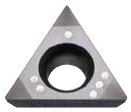
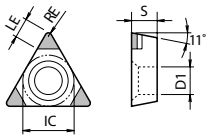
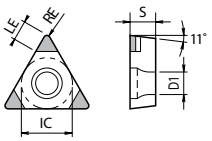
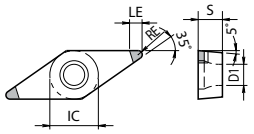
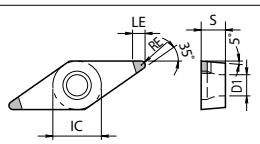
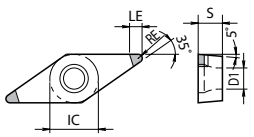
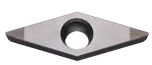
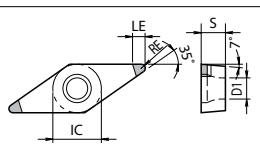
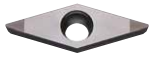
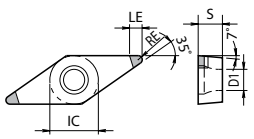
Shape		Part Number	Cutting Edge Preparation	Dimensions (in)		No. of Edges	MEGACOAT TOUGH		
				RE	LE		KBN010	KBN015	KBN020
 Multi-Edge		CCMW 21505T00315ME	T00315	0.008	0.079	2	●	●	●
		2151T00315ME		1/64	0.075		●	●	●
		2152T00315ME		1/32	0.071		●	●	●
		CCMW 32505T00315ME	T00315	0.008	0.079	2	●	●	●
		3251T00315ME		1/64	0.075		●	●	●
		3252T00315ME		1/32	0.071		●	●	●
 Multi-Edge / General Purpose		CCMW 2151S00525MES	S00525	1/64	0.075	2	●	●	●
		2152S00525MES		1/32	0.071		●	●	●
		CCMW 3251S00525MES	S00525	1/64	0.075	2	●	●	●
		3252S00525MES		1/32	0.071		●	●	●
 Multi-Edge / Tough		CCMW 3251S00435MET	S00435	1/64	0.075	2	●	●	●
		3252S00435MET		1/32	0.071		●	●	●
 Multi-Edge		CPGB 25151T00315ME	T00315	1/64	0.075	2	●	●	●
		CPGB 3205T00315ME	T00315	0.008	0.102	2	●	●	●
		321T00315ME		1/64	0.102		●	●	●
 Multi-Edge / General Purpose		CPGB 321S00525MES	S00525	1/64	0.098	2	●	●	●
		322S00525MES		1/32	0.098		●	●	●
 Multi-Edge / Tough		CPGB 25151S00435MET	S00435	1/64	0.075	2	●	●	●
		25152S00435MET		1/32	0.087		●	●	●
		CPGB 321S00435MET	S00435	1/64	0.098	2	●	●	●
		322S00435MET		1/32	0.098		●	●	●
 Multi-Edge		DCMW 21505T00315ME	T00315	0.008	0.094	2	●	●	●
		2151T00315ME		1/64	0.087		●	●	●
		2152T00315ME		1/32	0.075		●	●	●
		DCMW 32505T00315ME	T00315	0.008	0.094	2	●	●	●
		3251T00315ME		1/64	0.087		●	●	●
		3252T00315ME		1/32	0.075		●	●	●
		3253T00315ME		3/64	0.075		●	●	●
 Multi-Edge / General Purpose		DCMW 32505S00525MES	S00525	0.008	0.094	2	●	●	●
		3251S00525MES		1/64	0.087		●	●	●
		3252S00525MES		1/32	0.075		●	●	●
 Multi-Edge / Tough		DCMW 21505S00435MET	S00435	0.008	0.075	2	●	●	●
		2151S00435MET		1/64	0.067		●	●	●
		2152S00435MET		1/32	0.075		●	●	●
		DCMW 32505S00435MET	S00435	0.008	0.094	2	●	●	●
		3251S00435MET		1/64	0.087		●	●	●
		3252S00435MET		1/32	0.075		●	●	●
		3253S00435MET		3/64	0.075		●	●	●

● : Standard Item

Positive Inserts

Cutting Edge Preparation				
Symbol	Cutting Edge Specification	Indication		Shape Examples
T	Chamfered	T00315	0.003" x 15°chamfered	
S	Chamfered and Honed	S00525	0.005" x 25°chamfered and honed	

Part Number	IC	S	D1
TPGB 22_	1/4	1/8	0.138
TPGB 32_	3/8		0.177
TPGW 33_	3/8	3/16	0.173
VBGW 22_	1/4	1/8	0.110
VBGW 33_	3/8	3/16	0.173
VCGW 1515_	3/16	3/32	0.091

Shape		Part Number		Cutting Edge Preparation	Dimensions (in)		No. of Edges	MEGACOAT TOUGH		
					RE	LE		KBN010	KBN015	KBN020
 Multi-Edge		TPGB	2205T00315ME	T00315	0.008	0.091	3	●	●	●
			221T00315ME		1/64	0.083		●	●	●
			222T00315ME		1/32	0.071		●	●	●
 Multi-Edge / General Purpose		TPGB	221S00525MES	S00525	1/64	0.083	3	●	●	●
			222S00525MES		1/32	0.071		●	●	●
 Multi-Edge / Tough		TPGB	2205S00435MET	S00435	0.008	0.091	3	●	●	●
			221S00435MET		1/64	0.083		●	●	●
			222S00435MET		1/32	0.071		●	●	●
		TPGB	321S00435MET	S00435	1/64	0.071	3	●	●	●
			322S00435MET		1/32	0.059		●	●	●
 Multi-Edge / Tough		TPGW	331S00435MET	S00435	1/64	0.071	3	●	●	●
			332S00435MET		1/32	0.059		●	●	●
 Multi-Edge		VBGW	2205T00315ME	T00315	0.008	0.094	2	●	●	●
			221T00315ME		1/64	0.079		●	●	●
			222T00315ME		1/32	0.067		●	●	●
		VBGW	3305T00315ME	T00315	0.008	0.094	2	●	●	●
			331T00315ME		1/64	0.079		●	●	●
			332T00315ME		1/32	0.067		●	●	●
 Multi-Edge / General Purpose		VBGW	221S00525MES	S00525	1/64	0.079	2	●	●	●
		VBGW	331S00525MES	S00525	1/64	0.079	2	●	●	●
 Multi-Edge / Tough		VBGW	2205S00435MET	S00435	0.008	0.094	2	●	●	●
			221S00435MET		1/64	0.079		●	●	●
			222S00435MET		1/32	0.067		●	●	●
		VBGW	3305S00435MET	S00435	0.008	0.094	2	●	●	●
			331S00435MET		1/64	0.079		●	●	●
			332S00435MET		1/32	0.067		●	●	●
 Multi-Edge		VCGW	151505T00315ME	T00315	0.008	0.094	2	●	●	●
			15151T00315ME		1/64	0.079		●	●	●
 Multi-Edge / Tough		VCGW	151505S00435MET	S00435	0.008	0.094	2	●	●	●
			15151S00435MET		1/64	0.079		●	●	●
			15152S00435MET		1/32	0.067		●	●	●

● : Standard Item

KYOCERA

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08/2025