

THE NEW VALUE FRONTIER



CBN inserts for
hardened material

HH / HL chipbreaker

HH / HL chipbreaker



Excellent chip control when machining hardened material

2 chipbreaker for a wide range of machining applications

KBN05M insert grade with superior oxidation resistance and wear resistance

Small D.O.C.

For hardened steel finishing



HH chipbreaker

55 HRC or more

1st recommendation



HL chipbreaker

55 HRC or less



CBN inserts for machining hardened material

HH / HL chipbreaker

Excellent chip control when machining hardened material. 2 Chipbreaker for a wide range of applications.

1 Excellent chip control

Excellent chip control and low cutting force with edge preparation and sharp cutting performance.

Chip control comparison (Internal evaluation)



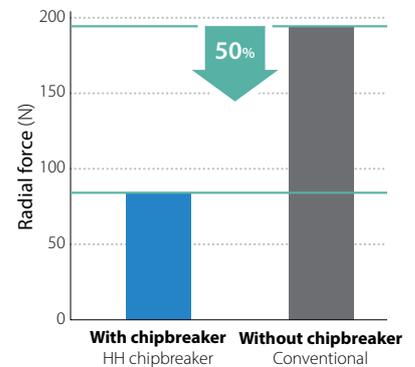
With chipbreaker
HH chipbreaker



Without chipbreaker
Conventional

Cutting conditions: $V_c = 150$ m/min, $a_p = 0.2$ mm, $f = 0.15$ mm/rev, 60 HRC, wet, CN**120408 type, after 21 min, workpiece: 15CrMo4

Cutting force comparison (Internal evaluation)



Cutting conditions: $V_c = 150$ m/min, $a_p = 0.2$ mm, $f = 0.15$ mm/rev, wet, CN**120408 type workpiece: 15CrMo4, 60 HRC

2 2 chipbreaker for a wide range of machining applications

Various applications and cutting conditions are possible with 2 unique chipbreaker designs

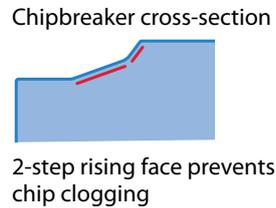
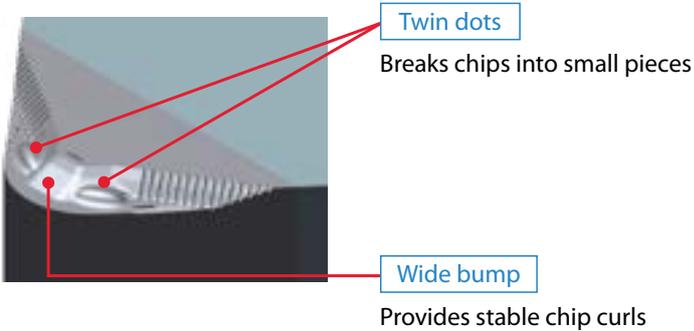
Chipbreaker	Application	Recommended cutting range
HH  1st recommendation	Hardened steel finishing 55HRC or more	Small D.O.C. $a_p = 0.1 \sim 0.3$ mm
HL 	Hardened steel finishing 55HRC or less	

3 HH/HL chipbreaker for hardened steel finishing

Small D.O.C.
($a_p = 0.1 \sim 0.3$ mm)

Excellent chip control and low cutting force when machining hardened material

1st recommendation **HH chipbreaker** (55HRC or more)

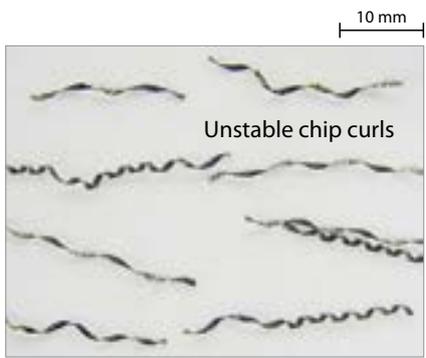


Stable chip control for hardened workpieces which are 55 HRC or more

Chip control comparison (Internal evaluation)

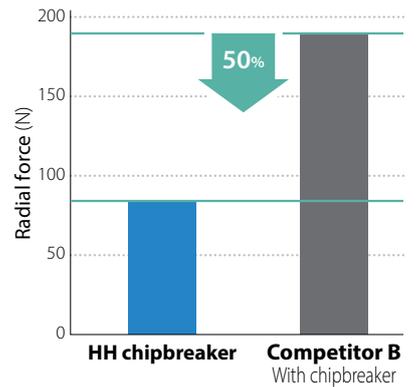


HH chipbreaker



Competitor A
With chipbreaker

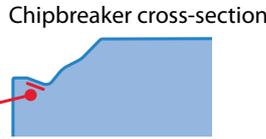
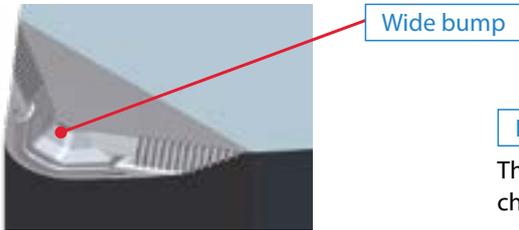
Cutting force comparison (Internal evaluation)



Cutting conditions: $V_c = 150$ m/min, $a_p = 0.2$ mm, $f = 0.20$ mm/rev, wet, CN**120408 type
Workpiece: 15CrMo4, 55 HRC

Cutting conditions: $V_c = 150$ m/min, $a_p = 0.2$ mm, $f = 0.15$ mm/rev, wet, CN**120408 type
Workpiece: 15CrMo4, 60 HRC

HL chipbreaker (Workpiece 55 HRC or less)



The rake can scoop up and control chips of softer material

Stable chip curls for workpieces which are 55 HRC or less

Chip Control Comparison (Internal Evaluation)



HL chipbreaker



Competitor C (With chipbreaker)

Cutting conditions: $V_c = 150$ m/min, $a_p = 0.2$ mm, $f = 0.20$ mm/rev, wet, CN**120408 type workpiece: 15CrMo4, 50 HRC

Negative type inserts

Edge preparation: E Cutting edge spec.: Honed ★: 1st recommendation			H	Hardened material (Continuous/Interruption)					★
Shape	Description	Edge preparation	Dimensions (mm)					No. of cutting edge	MEGACOAT CBN
			IC	S	D1	RE	LE		KBN05M
~55HRC Small D.O.C.		E	12.7	4.76	5.16	0.4	2.6	2	●
						0.8	2.6		●
						1.2	2.5		●
		E	12.7	4.76	5.16	0.4	2.6	2	●
						0.8	2.2		●
						1.2	1.9		●
~55HRC Small D.O.C.		E	12.7	4.76	5.16	0.4	2.6	2	●
						0.8	2.6		●
						1.2	2.5		●
		E	12.7	4.76	5.16	0.4	2.6	2	●
						0.8	2.2		●
						1.2	1.9		●

● : Available

Recommended cutting conditions

Chipbreaker	Workpiece	Application	Insert grades	Min. - Recommendation - Max.		
				Vc (m/min)	ap (mm)	f (mm/rev)
HH	Hardened material (55 HRC or more)	Finishing	KBN05M	100-150-200	0.1-0.2-0.3	0.1-0.15-0.25
HL	Hardened material (55 HRC or less)					

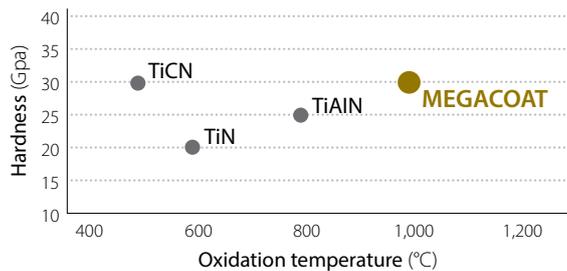
MEGACOAT CBN - KBN05M

Hybrid grain structure for high hardness and high strength - MEGACOAT ensures longer tool life

MEGACOAT

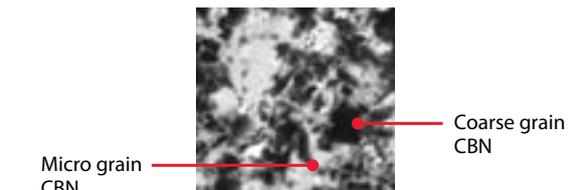
Superior oxidation resistance and wear resistance

Coating properties



Hybrid grain structure

Mixed structure of micro grain CBN and coarse grain CBN provides high hardness, toughness and thermal shock resistance characteristics.



Thermal conductivity