KYOCERA

H Chipbreaker Series

CBN Inserts for Machining Hardened Materials

Unique Molded Chipbreaker for Excellent Chip Control in Hardened Material

Excellent chip control with molded chipbreaker

KBN05M insert grade with superior oxidation resistance and wear resistance

Small D.O.C.
for Hardened Steel Finishing

HH Chipbreaker
(55HRC~)

HL Chipbreaker
(~55HRC)

1st Recommendation

H Chipbreaker Series

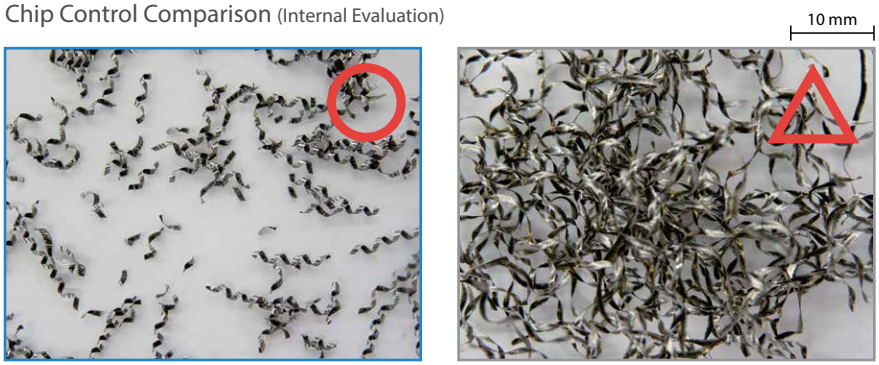
CBN Inserts for Machining Hardened Material

Unique Molded Chipbreaker Provides Excellent Chip Control when Machining Hardened Material

1 Excellent Chip Control with Molded Chipbreaker

Molded chipbreaker delivers excellent chip control and low cutting force with edge preparation and sharp cutting performance

Chip Control Comparison (Internal Evaluation)

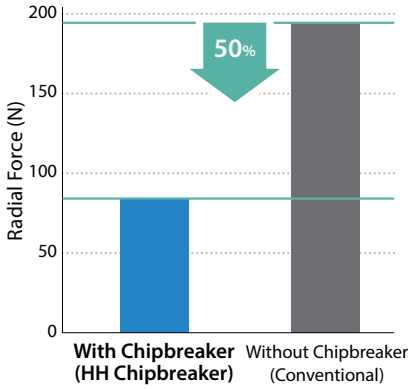


With Chipbreaker
(HH Chipbreaker)

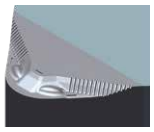
Without Chipbreaker
(Conventional)

Cutting Conditions: Vc = 490 sfm, D.O.C. = 0.008"
f = 0.006 ipr, 60HRC, Wet, CN**432 Type after 21min Workpiece: 4131, 60HRC

Cutting Force Comparison (Internal Evaluation)



Cutting Conditions: Vc = 490 sfm, D.O.C. = 0.008"
f = 0.006 ipr, Wet, CN**432 Type
Workpiece: 4131, 60HRC

Chipbreaker	Application	Recommended Cutting Range
HH  1st Recommendation	Hardened Steel Finishing 55HRC or more	Small D.O.C. (D.O.C. = 0.004" ~ 0.012")
HL	Hardened Steel Finishing 55HRC or less	

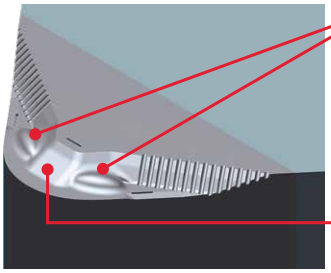
2 HH / HL for Hardened Steel Finishing

Small D.O.C.
(D.O.C. = 0.004" ~ 0.012")

Molded chipbreaker provides excellent chip control and low cutting force when machining hardened material

1st Recommendation

HH Chipbreaker (Workpiece 55HRC or more)



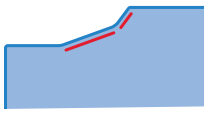
Twin Dots

Breaks chips into small pieces

Wide Bump

Provides stable chip curls

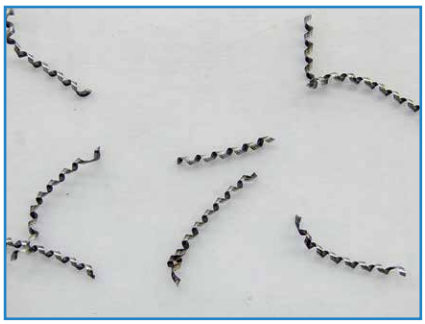
Chipbreaker cross-section



2-step rising face prevents chip clogging

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

Chip Control Comparison (Internal Evaluation)

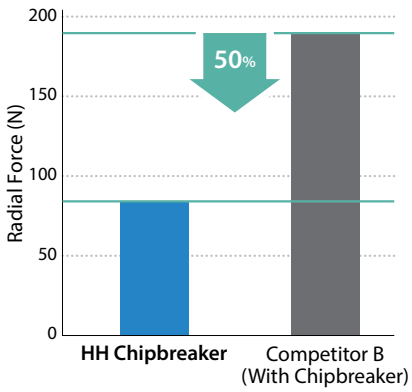


HH Chipbreaker

Competitor A
(With Chipbreaker)

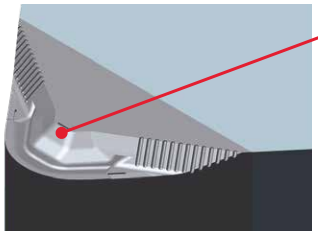
Cutting Conditions: Vc = 490 sfm, D.O.C. = 0.008", f = 0.008 ipr, Wet, CN**432 Type
Workpiece: 4131H, 55HRC

Cutting Force Comparison (Internal Evaluation)



Cutting Conditions: Vc = 490 sfm, D.O.C. = 0.008"
f = 0.006 ipr, Wet, CN**432 Type
Workpiece: 4131H, 60HRC

HL Chipbreaker (Workpiece 55HRC or less)



Wide Bump

Chipbreaker cross-section

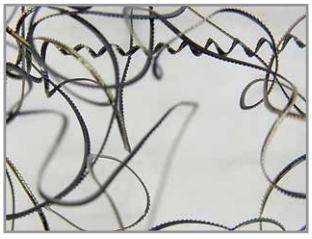
Rake Surface

Stable chip control for softer interior of hardened materials

Stable chip curls for workpieces which are 55HRC or less

Chip Control Comparison (Internal Evaluation)

HL Chipbreaker



Competitor C (With Chipbreaker)

Cutting Conditions: Vc = 490 sfm, D.O.C. = 0.008", f = 0.008 ipr, Wet, CN**432 Type Workpiece: 4131H, 50HRC

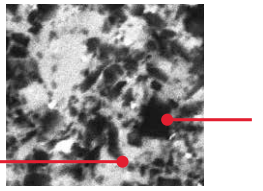
MEGACOAT CBN KBN05M

Hybrid Grain Structure for High Hardness and High Strength
MEGACOAT Coating Technology Ensures Longer Tool Life

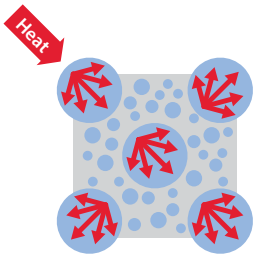
Combination of a Hybrid Grain Structure and MEGACOAT Provides Superior Oxidation Resistance and Wear Resistance

Hybrid Grain Structure

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



High Thermal Conductivity

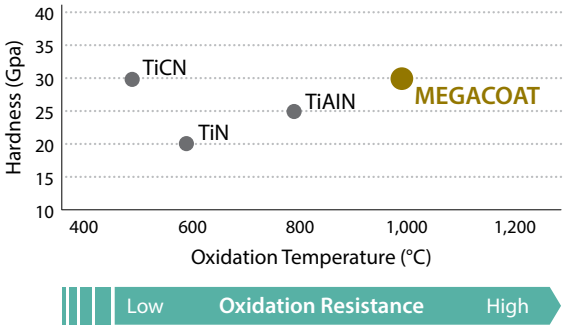


Coarse grain CBN quickly transfers heat

MEGACOAT

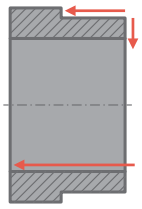
Superior Oxidation Resistance and Wear Resistance

Coating Properties



Case Studies

Pinion - Chromium Molybdenum Hardened Steel (55 ~ 62HRC)



Vc = 430 sfm
D.O.C. = 0.002"
f = 0.003 ipr
Dry

CNGM120408ME-HH

Tool Life

HH Chipbreaker — **70 pcs/edge** — Tool Life 2.3x

Competitor F (Without Chipbreaker) — **30 pcs/edge**

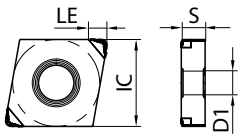
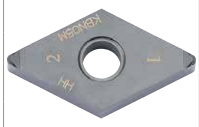
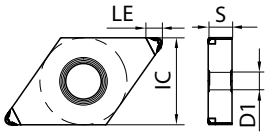
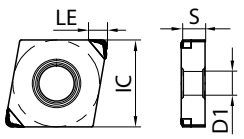
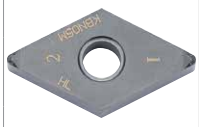
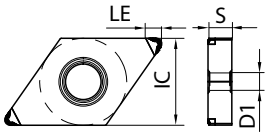
The HH chipbreaker maintained 2.3 times longer tool life than Competitor F. The molded chipbreaker provided stable chip control.

(User Evaluation)

Negative Inserts

Edge Preparation	Cutting Edge Specification	★ : 1st Recommendation
E	Honed	
S00535	0.005" X 35°	

	H	Hardened Material	★

Shape			Part Number	Edge Prep	Dimensions (in)					No. of Edges	MEGACOAT CBN
					I.C.	S	D1	RE	LE		KBN05M
55HRC~	 Small D.O.C.		CNGM431ME-HH	E	1/2	3/16	0.203	1/64	0.102	2	●
			CNGM432ME-HH					1/32	0.102		●
			CNGM433ME-HH					3/64	0.098		●
	 Small D.O.C.		DNGM431ME-HH					1/64	0.102		●
			DNGM432ME-HH					1/32	0.087		●
			DNGM433ME-HH					3/64	0.075		●
~55HRC	 Small D.O.C.		CNGM431ME-HL	E	1/2	3/16	0.203	1/64	0.102	2	●
			CNGM432ME-HL					1/32	0.102		●
			CNGM433ME-HL					3/64	0.098		●
	 Small D.O.C.		DNGM431ME-HL					1/64	0.102		●
			DNGM432ME-HL					1/32	0.087		●
			DNGM433ME-HL					3/64	0.075		●

● : Standard Item

Recommended Cutting Conditions

Chipbreaker	Workpiece	Application	Insert Grade	MIN - Recommendation - MAX		
				Cutting Speed Vc (sfm)	D.O.C. (mm)	f (ipr)
HH	Hardened Material (55HRC or more)	Finishing	KBN05M	330 - **490** - 660	0.004 - **0.008** - 0.012	0.004 - **0.006** - 0.010
HL	Hardened Material (55HRC or less)					

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